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Journal for educational research online 17 (2025) 1, S. 47-73

Journal for Educational Research Online
Journal für Bildungsforschung Online
https://doi.org/10.31244/jero.2025.01.03
Volume 17 (2025), No. 1, S. 47–73

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Situation-Specific Skills in Classroom Management of Pre-Service Teachers. Linking with Professional Knowledge, Self-Efficacy, and Student-Rated Classroom Management Quality

Abstract

Research suggests that teacher competence, such as professional knowledge, affective-motivational characteristics, and situation-specific skills, are prerequisites for effective teaching. However, few studies have examined the entire theoretically derived relationships in the context of classroom management. This study investigated the relationship between professional knowledge, self-efficacy, situation-specific skills, and instructional quality in the context of classroom management. We surveyed 1,321 students from 82 pre-service teachers in their long-term internship. Contrary to expectations, results from multilevel regression analyses indicated that only classroom management knowledge predicted student rated rule clarity. Situation-specific skills measured with rating items showed unexpected negative associations with student ratings of monitoring and managing momentum. No further significant relationships were found. The findings underline the challenge of translating competence into effective classroom practice and call for further research on contextual influences.

Keywords

Classroom management, Professional knowledge, Self-efficacy, Situation-specific skills, Classroom management quality

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Situationsspezifische Fähigkeiten in Bezug auf Klassenführung bei angehenden Lehrkräften. Zusammenhänge mit professionellem Wissen, Selbstwirksamkeit und schüler*inneneingeschätzter Klassenführungsqualität

Zusammenfassung

*Die Forschung legt nahe, dass Lehrkräftekompetenzen wie professionelles Wissen, affektiv-motivationale Merkmale und situationsspezifische Fähigkeiten Voraussetzungen für einen effektiven Unterricht sind. Allerdings haben erst wenige Studien systematisch alle theoretisch angenommenen Zusammenhänge im Kontext der Klassenführung untersucht. Aus diesem Grund wurde in der vorliegenden Studie der Zusammenhang zwischen professionellem Wissen, Selbstwirksamkeit, situationsspezifischen Fähigkeiten sowie der schüler*inneneingeschätzten Unterrichtsqualität im Kontext von Klassenführung erforscht. Dafür wurden 1321 Schüler*innen von 82 Lehramtsstudierenden im Rahmen eines Langzeitpraktikums befragt. Entgegen den Erwartungen zeigten die Ergebnisse der Mehrebenenregressionsanalysen, dass nur das Wissen über Klassenführung der Lehramtsstudierenden die von Schüler*innen eingeschätzten Regelklarheit vorhersagen konnten. Situationsspezifische Fähigkeiten, gemessen über Ratingitems, zeigten unerwartete negative Zusammenhänge mit den Klassenführungsfacetten Monitoring und Strukturierung. Weitere signifikante Zusammenhänge wurden nicht gefunden. Die Befunde unterstreichen die Herausforderung, professionelles Wissen und Wahrnehmung in wirksames Unterrichtshandeln zu übersetzen und verdeutlichen den Bedarf an weiterer Forschung zu kontextuellen Einflussfaktoren.*

Schlagworte

Klassenführung, Professionelles Wissen, Selbstwirksamkeit, Situationsspezifische Fähigkeiten, Klassenführungsqualität

1. Introduction

In recent decades, scholars have become increasingly interested in teachers' professional knowledge and affective-motivational characteristics, because they are considered prerequisites for effective teaching with high instructional quality (e. g., Baumert & Kunter, 2013; Krauss et al., 2020; Kunter et al., 2013). In addition, more situated aspects of competence have also been examined. Blömeke et al. (2015) summarized knowledge-based processes of perception, of interpretation of relevant classroom situations, and, consequently, of deciding how to act under the term *situation-specific skills*. In their theoretical competence model, they assumed a chain of effects in which situation-specific skills serve as mediators between teacher's dis-

positions[2], as they term knowledge and affective-motivational competence aspects, and instructional quality.

Studies have already found evidence of single links between situation-specific skills and professional knowledge (e. g., Kersting et al., 2010; Gold & Holodynski, 2017) or between situation-specific skills and instructional quality (e. g., König & Kramer, 2016; Roth et al., 2011). However, only few studies have considered the entire theoretically derived relationships of *dispositions – situation-specific skills – instructional quality*. Although this model is empirically supported with a focus on mathematics education (e. g., Blömeke et al., 2022; Kersting et al., 2012; Krauss et al., 2020). The few studies that focus on pedagogical aspects, such as classroom management, are rare and have shown rather inconsistent results (König et al., 2021; Junker et al., 2021). Methodological differences in how situation-specific skills are conceptualized and measured further complicate comparisons and highlight the need for additional research – particularly with pre-service teachers nearing the end of their training, a group rarely studied in this context.

This study addresses this gap by examining the relationship between pre-service teachers' professional competences and instructional quality in the domain of classroom management. Specifically, we investigate whether cognitive (knowledge) and affective-motivational (self-efficacy) aspects of competence predict classroom management quality, and whether this relationship is mediated by situation-specific skills, in line with the competence model proposed by Blömeke et al. (2015).

2. Theoretical Framework

2.1 Professional Knowledge and Self-efficacy as Dispositions in the Context of Classroom Management

Teachers play a key role in establishing high instructional quality and successful student learning. Several existing models of teacher competence assume that *professional knowledge* and *affective-motivational characteristics* are prerequisites for effective teaching (e. g., Blömeke et al., 2015; Krauss et al., 2020; Kunter et al., 2013).

In addition to subject-specific knowledge, pedagogical-psychological knowledge includes strategies for effective classroom management (Voss et al., 2011), which is essential for maximizing learning time and promoting student achievement (Kunter et al., 2013; Wang et al., 1993). Therefore, teachers must be capable of maintaining and strengthening classroom activities and student learning while preventing and

2 "While the term "dispositions" is commonly interpreted as enduring personality traits, within the context of this article, we employ it to encompass cognitive and motivational-affective competence facets of teachers, specifically focusing on professional knowledge and self-efficacy beliefs. Blömeke et al. (2015) refer to these as "cognitive and motivational resources" (p. 6) that underlie effective performance in real-world professional scenarios.

interrupting disruptions and student misbehavior (Doyle, 2006). To enable learning and maximize students' time on task, well-established rules and routines are important (Evertson & Emmer, 2012). The teacher should maintain a comprehensive overview of what is happening in the classroom, known as withitness (Kounin, 1970), so that disruptions can be prevented or actively and appropriately stopped (Doyle, 2006; Kounin, 1970). An adaptive and steady learning flow with smooth transitions between classroom activities, as well as the active involvement and engagement of as many students as possible, is broadly referred to as managing momentum (Evertson & Emmer, 2012; Kounin, 1970).

Apart from professional knowledge, affective-motivational dispositions such as self-efficacy also play a key role in teaching success (Baumert & Kunter, 2013). Self-efficacy is described as critical self-beliefs about one's individual abilities to cope with challenging situations and to successfully complete given tasks using one's own abilities (Bandura, 1997). A research synthesis by Zee and Koomen (2016) highlighted the importance of self-efficacy for student achievement (e. g., Kim & Seo, 2018) and practices related to instructional quality (e. g., Klassen & Tze, 2014).

In addition to the aforementioned cognitive and affective-motivational dispositions, current educational research increasingly examines situation-specific skills in order to predict instructional quality.

2.2 Situation-specific Skills in Classroom Management

By situation-specific skills focused on classroom management, we refer to the abilities to recognize relevant situations for classroom management, to interpret these situations against the background of one's professional knowledge, and to decide on a suitable action. Compared to professional knowledge, situation-specific skills are closer to behavior, because they relate to authentic job situations, and require the ability to focus on critical events in the classroom, which is important for high instructional quality and thus successful student learning (Blömeke et al., 2015; Putnam & Borko, 2000). According to Blömeke et al.'s (2015) model, they mediate between dispositions and classroom performance.

Assessment of situation-specific skills is typically conducted using contextualized instruments based on short video clips of classroom instruction to represent authentically the situational context of teaching (Borko, 2016; Kaiser et al., 2015). Video-based measurements use either open task formats, such as written reports, that have to be coded (e. g., Dückers et al., 2022; Kersting et al., 2012), closed task formats such as rating items that are compared to an expert rating (e. g., Gold & Holodynski, 2017; Seidel & Stürmer, 2014), or even a combination of formats (e. g., Frommelt et al., 2019; Schäfer & Seidel, 2015). The different assessment formats differ in terms of cognitive task potential and cognitive demands (Martinez, 1999). Open formats demand higher cognitive effort, while standardized items can guide attention toward certain events (Gold & Holodynski, 2017; Weyers et al., 2023).

To comprehensively assess situation-specific skills, we used both a closed format (rating items) and an open format (analytical comments). This allowed us to examine which format better predicts instructional quality (e. g., Kersting et al., 2012; Krauss et al., 2020).

2.3 Relations Between Dispositions, Situation-specific Skills, and Classroom Management Quality

Some studies have already examined the relationships between dispositions and situation-specific skills in the context of classroom management. They indicated correlations between situation-specific skills and knowledge (e. g., Gold & Holodynski, 2017; König & Kramer, 2016; König et al., 2021) or between situation-specific skills and self-efficacy (e. g., Gold et al., 2017; Junker et al., 2021). However, few studies included indicators of classroom management quality in order to investigate its relationship to situation-specific skills (see Table 1). These correlations tended to be inconsistent; often limited to single dimensions of situation-specific skills or of classroom management quality. Moreover, different task formats assessed varied processes, and most samples focused on experienced teachers rather than beginners.

Table 1: Studies relating situation-specific skills and classroom management quality

Name of the Assessment (Authors)	Situation-specific skills	Task format	Findings with regard to classroom management	Sample
Classroom Management Expertise (CME) (König & Kramer, 2016)	overall CME (holistic perception, accuracy of perception, interpretation and justification of action)	multiple-choice items and open-ended items	CME predicts withitness (β = .47) and clarity of rules (β = .36)	teachers
Classroom Management Expertise (CME) (König et al., 2021)			CME predicts cognitive activation (β = .32) but not student support or classroom management	teachers
Professional Vision of Classroom Management (PVCM)[1] (Junker et al., 2021)	overall PVCM (description, interpretation; content facets: monitoring, managing momentum, rules and routines)	rating items	No associations between PVCM overall and all single facets with classroom management quality	beginning teachers
Professional Vision of Classroom Management (PVCM)[1] (Gold et al., 2021)			student behaviour in class was predicted by overall PVCM (β = .33), PV of monitoring (β = .31), PV of managing momentum (β = .31), PV of rules and routines (β = .37); but no prediction of the teacher-related facets of monitoring, managing momentum, or clarity of rules	teachers

Name of the Assessment (Authors)	Situation-specific skills	Task format	Findings with regard to classroom management	Sample
Video Assessment of Interactions and Learning (VAIL) (Jamil et al., 2015)	overall VAIL (detecting and identifying skills)	open-ended format	VAIL predicts instructional supports (β = .17), but no prediction of emotional support and classroom organization	teachers
Video Assessment of Interactions and Learning (VAIL) (Wiens et al., 2021)			VAIL predicts emotional support (β = .18), but no prediction of classroom organization and instructional support	preservice teachers

[1]by Gold & Holodynski, 2017

2.4 Study Aim

Existing research has found evidence of relationships between professional knowledge and self-efficacy and situation-specific skills (e. g., Blömeke et al., 2022; Krauss et al., 2020). Building on this, our study focused on classroom management and examined how these competence aspects relate to instructional quality, as outlined in Blömeke et al.'s (2015) model. We focused on pre-service teachers, where smaller correlations are expected but still yield valuable insights into teacher professionalisation and implications for teacher training. By combining closed rating tasks and open analytical comments, we aimed to capture situation-specific skills more comprehensively and examine potential format-specific effects. We examined the following research questions:

RQ1: Do the aspects of pre-service teachers' professional competence (knowledge, self-efficacy, and situation-specific skills) related to classroom management predict classroom management quality?

We expected that higher levels of knowledge, self-efficacy, and situation-specific skills should explain differences in classroom management quality (H1a). Due to inconsistent findings regarding the correlations between situation-specific skills and classroom management quality and based on prior findings in mathematics education (e. g., Kersting et al., 2012, Krauss et al., 2020; Roth et al., 2011), we also assumed that open task formats would predict classroom management quality more strongly than closed formats (H1b).

RQ2: Do situation-specific skills regarding classroom management mediate the relationship between dispositions (knowledge and self-efficacy) related to classroom management and classroom management quality?

Based on the theoretical competence model by Blömeke et al. (2015), we hypothesized – as Krauss et al. (2020) and Blömeke et al. (2022) in mathematics education – an indirect effect of dispositions (knowledge and self-efficacy) on classroom management quality through situation-specific skills (H2a), with stronger effects expected for the open task format (H2b).

3. Method

3.1 Sample and Procedure

The study was conducted with 84 pre-service teachers for elementary and secondary school in a master's program, representing the end of the academic phase of German teacher education, which involves five years of university that are intended to provide future teachers a science-based education with practical components.

We created an online survey via unipark (https://www.unipark.com/) to measure knowledge, self-efficacy, and situation-specific skills at the end of their second master's semester. The pre-service teachers were free to decline their data being used for scientific purposes. We had to exclude two pre-service teachers because they did not answer the open task. In their ultimate or penultimate semester, the pre-service teachers independently taught trial lessons as part of an internship semester after accompanying the teacher in this class. After one of the last lessons, if the parents had given their consent, the students rated the pre-service teachers' classroom management quality in a survey. The pre-service teachers had nearly conducted the majority of the 20 compulsory lessons which they had to complete independently ($M = 16.97$; $SD = 10.24$). Students were asked to collect data in the class in which they spent the most time. However, it was not indicated how many hours and when the last independently taught lesson took place in exactly that class.

On average, the 82 pre-service teachers in the sample were 23.39 years old ($SD = 2.58$; 8.2 % missing data; 74.4 % female, 14.6 % male, 11.0 % missing data) and taught children in the following grade levels: grade 3 (28 pre-service teachers), grade 4 (40 pre-service teachers), grade 5 (11 pre-service teachers), and grade 6 (three pre-service teachers). The number of students that participated in the survey was 1,321 (average class size of 16.11 students), with a mean age of 9.69 years ($SD = 0.99$; Min. = 7, Max. = 14; 49.1 % female, 50.8 % male, 0.1 % missing data).

3.2 Instruments

3.2.1 Classroom Management Knowledge

To assess the knowledge of classroom management, we used a test (Kurz & Lenske, 2018) capturing declarative and conditional-procedural knowledge of class-

room leadership including three facets (instructional clarity, teacher-student relationship, and student monitoring) which comprises 12 testlets with four to six multiple-choice items each (e. g., Task 10: "From the perspective of classroom management, teachers show withitness if, among other things, they (a) stand by their students in every situation of their lives, (b) are present not only in their own class but also in matters concerning the entire college and all students, (c) position themselves adequately in the room, and (d) notice disruptions immediately"). The facets of instructional clarity and student monitoring are comparable to our understanding of classroom management. Items were rated as (rather) correct or incorrect and scored accordingly. After excluding 12 of 55 items due to low item-test correlations, the remaining 43 items showed low to acceptable internal consistency (Cronbach's $\alpha = .60$). The total score was used for further analyses.

3.2.2 Self-efficacy Regarding Classroom Management

To assess self-efficacy regarding classroom management, we used a validated German version (Pfitzner-Eden et al., 2014) of the Teacher's Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001). The pre-service teachers rated four items on a 9-point Likert scale (1 = "Not at all certain I can do it" to 9 = "Absolutely certain I can do it") – for example, "How certain are you that you can (1) control disruptive behavior in the classroom?" The sample exhibited very good internal consistency (Cronbach's $\alpha = .89$).

3.2.3 Situation-specific Skills in Classroom Management

In addition to a brief explanation of the test procedure, the pre-service teachers received a short definition of classroom management before they watched an approximately 2-minute video clip from an early science lesson in primary school that showed relevant events regarding classroom management. The task was to identify all events relevant to classroom management, interpret them, and suggest appropriate courses of action for each of these events (adapted from Dückers et al., 2022). After a second viewing, they had 30 minutes to complete the task using a structured table, with each row representing one event (though multiple events could be noted per row).

A coding manual was developed according to evaluations of six experts on research on classroom management and teaching practice. These experts first rated whether the video clip itself was appropriate for observing classroom management on a four-point Likert scale (1 = "I disagree"; 4 = "I agree") ($M = 4.00$, $SD = 0.00$) and close to everyday classroom practice ($M = 3.83$, $SD = 0.41$). They identified nine key events (e. g., "Lack of omnipresence due to poor teacher positioning," "Ineffective admonishment in case of disturbance," or "Lack of enforcement of rules and rou-

tines"). The pre-service teachers received one point for each noticed event, meaning that nine points could be scored for *perception*.

Regarding *interpretation*, the quality of the participants' respective interpretations was assessed hierarchically for each noticed event: 0 points = not interpreted/interpreted without agreement with experts, 1 point = interpreted in agreement with experts without justification, 2 points = interpreted in agreement with experts with explanation, or 3 points = correctly interpreted with explanation and appropriate technical terminology. The mean values of the interpretation levels across the recognized events were used for further analyses.

Regarding *decision-making*, four points could be achieved per event with the points being summative: 0 points = no alternative action was mentioned, 1 point = one alternative action was mentioned, 1 point = justified choice of an alternative action, 1 point = technical terms used, and 1 point = discussed (several alternative actions were weighed against each other). The mean value of all alternatives was subsequently used for further calculations.

Thirty percent of the data were independently double coded across multiple coding steps. Cohen's Kappa served as the measure of agreement, demonstrating good to very good agreement for all processes: $\kappa_{perception} = .74$, $\kappa_{interpretation} = .74$, $\kappa_{decision\text{-}making} = .82$. In the absence of agreement, consensus was reached via collective discussion.

For the closed task format, we used an adapted version of the video-based test developed by Gold and Holodynski (2017). Three video clips from early science lessons in elementary schools were used, followed by a total of 41 items on a four-point Likert scale (1 = "I disagree"; 4 = "I agree") covering mainly the process of interpreting relevant classroom management events (e. g., "The teacher succeeds in bringing calm to the class"; "It is not clear to many students during the transition that a new phase of instruction is beginning"; "The teacher ensures that students follow the rules"). Responses were dichotomized against the expert rating so that one point was given for the correct answer and zero points for the other three scale points. The proportion of correct answers was used in analyses (range = 0–1). The overall test reached good internal consistency, Cronbach's $\alpha = .89$.

3.2.4 Classroom Management Quality

The pre-service teachers' classroom management was rated by the students using a questionnaire which is one common procedure for measuring classroom management quality. This procedure has been repeatedly evaluated as reliable and construct valid regarding classroom management quality (e. g., van der Scheer et al., 2019). All items were read aloud by the pre-service teachers to avoid language and reading difficulties. In preparation, the pre-service teachers received an implementation manual in advance to standardize the survey situation. The implementation manual made it clear to the students that their rating of the lesson should only concern the pre-service teachers. First, age and gender were queried, along

with native language information on a 4-point scale: "How often do you speak German at home?" (*never* [1] to *always* [4]). On average, the students reported always speaking German at home ($M = 3.57$, $SD = 0.72$; 69.8% always, 18.3% nearly always, 10.8% sometimes, and 0.9% never). Additionally, three items were used to capture teacher popularity (Wagner, 2008, e. g., "I like my teacher very much", Cronbach's $\alpha = .87$; $M = 3.75$, $SD = 0.50$), as teacher popularity proved to be an informative indicator of teacher effectiveness and may be confounded with the assessment of the quality of teaching (Fauth et al., 2018). This general impression of the teacher appears to be particularly relevant especially in earlier grades of school (e. g. Doll et al., 2010; Fauth et al., 2014).

Table 2: Overview of student ratings with Cronbach's alpha and intraclass correlation coefficients

	Source	Sample item (Number of items)	α	ICC (1)	ICC (2)
Monitoring[a]	Spoden & Fricke, 2018	The teacher notices immediately if we start to behave disruptively. (6)	.61	.17	.77
Managing momentum[b]	Helmke & Lenske, 2013; Piwowar, 2013	The teacher speaks in a way so that I can understand all the words. (5)	.61	.17	.78
Rule clarity[c]	Spoden & Fricke, 2018	We know what will happen if we do not follow the rules. (4)[3]	.54	.09	.64
Student behavior[a]	Spoden & Fricke, 2018	There often are times when students disrupt the lesson. (6)	.85	.37	.90

Note. Items in the *student behavior* scale were reversed. [a]$N = 1315$, [b]$N = 1314$, [c]$N = 1319$.

The classroom management items were adapted from the Students Perceptions on Classroom Management questionnaire (Spoden & Fricke, 2018) covering the facets *monitoring* (original scale name: prevention of disruption), *rule clarity* (original scale name: rules and rituals), and *student behavior* (original scale name: discipline). To add another scale *managing momentum*, we selected items from a scale by Helmke and Lenske (2013) and a scale by Piwowar (2013). All items were rated on a four-point Likert scale (1 = "No" to 4 = "Yes"), and the overall scales exhibited acceptable to good internal consistency (see Table 2). Internal consistency estimates were somewhat lower in grades 3 to 5 (monitoring: $.59 < \alpha < .60$; managing momentum: $.57 < \alpha < .62$; rule clarity: $.51 < \alpha < .58$; student behavior: $.83 < \alpha < .85$) compared to grade 6 (monitoring: $\alpha = .80$; managing momentum: $\alpha = .76$; rule clarity: $\alpha = .68$; student behavior: $\alpha = .89$). Lower alpha values may still be sufficient in applied settings, especially when scales are short or used with younger students. ICC(2) is therefore reported as a further indicator for the accuracy of class-mean

3 There are 5 items in the original scale. We decided to exclude the item "I know where to look if I forget a rule (Example: There is a poster in class with all the rules written on it.)" before the survey, as we believed that this item would be rated more based on the behaviors of the classroom teachers than of the pre-service teachers.

ratings (Lüdtke et al., 2009). Although the internal consistencies and ICC(2)-indices were somewhat lower – especially for the rule clarity subscale – the scales were retained in the analyses given their theoretical relevance and content validity. ICC(1) -indices of these scales indicated a substantial amount of variance (from 9% to 37%) between classes. In addition, the intraclass correlation coefficients of the student assessments indicated a multilevel structure of the data regarding class membership. A multilevel confirmatory factor analysis ($N = 1321$, $k = 82$) with the four facets as factors indicated construct validity, $\chi^2\ (366) = 757.055$, $p < .001$; RMSEA = .03; CFI = .90; $SRMR_{within} = .04$; $SRMR_{between} = .16$).

3.3 Data Analysis

Regarding our first research question, we performed multilevel linear regression analyses. To account for the hierarchical structure of the data, student variables were at Level 1 and the pre-service teacher data were at Level 2, with the four scales of classroom management quality as the dependent variables and knowledge, self-efficacy, and situation-specific skills (Appendix Table A1a to Table A1d) as independent variables. Multilevel latent covariate models (MLC) were applied, in which the dependent variables as latent factors were specified at both the individual and group level (Lüdtke et al., 2008). In order to reduce model complexity, each model included only one scale of classroom management as the dependent variable. The demographic variables of age, gender, native language and teacher popularity were included as control variables. The variables were group-mean centered at the within level and class-mean centered at the between level. Dispositions, situation-specific skills, and all competence facets together were included as simultaneous predictors to investigate their effects on the four scales of classroom management quality using a multivariate approach (see Appendix Table B).

Finally, for our second research question, two-level random-intercept mediation models should be calculated to examine the assumed mediation effect of situation-specific skills for the relationship between pre-service teachers' dispositions and the four scales of classroom management quality. Although a mediation model was initially considered, the necessary preconditions according to Baron and Kenny (1986) were not met. Therefore, no further mediation analysis was conducted. Descriptive statistics and all multilevel analyses were calculated with M*plus* 8 (Muthén & Muthén, 2017) using the full information maximum likelihood algorithm to estimate missing values. A pattern analysis with SPSS 28 did not indicate systematic missing data across items or scales.

4. Results

4.1 Descriptive Statistics

Descriptive statistics are reported in Table 3 and Table 4. Overall, the students rated the quality of classroom management as relatively good. Only student behavior was rated relatively low, with the greatest discrepancies between classes observed in accordance with the higher standard deviation. A few facets correlated significantly with each other.

Table 3: Descriptive statistics for student ratings

	M	*SD*	Min.	Max.	1	2	3	4
(1) Monitoring[a]	3.21	0.47	1.33	4.00		.28***	.36***	.12***
(2) Managing momentum[b]	3.46	0.49	1.00	4.00	.45**		.14***	.43***
(3) Rule clarity[c]	3.53	0.47	1.00	4.00	.44**	.42**		.01
(4) Student behavior[a]	2.59	0.75	1.00	4.00	.11	.83***	.20	

Note. Above the diagonal: bivariate correlations within classes; below the diagonal: bivariate correlations between classes; [a]$N = 1315$, [b]$N = 1314$, [c]$N = 1319$; ** $p < .01$, *** $p < .001$.

Table 4: Descriptive statistics for pre-service teacher variables

	M	*SD*	Min.	Max.	Possible Range
Classroom management knowledge[a]	0.79	0.07	0.58	0.93	0–1
Self-efficacy[b]	6.63	1.03	3.25	9.00	1–9
SSS – rating items[a,4]	0.50	0.19	0.08	0.84	0–1
SSS – perception[a]	4.74	1.35	2.00	8.00	0–9
SSS – interpretation[a]	0.74	0.56	0.00	2.20	0–3
SSS – decision-making[a]	1.86	0.47	1.00	2.80	0–4

Note. SSS = situation-specific skills. [a]$N = 73$, [b]$N = 72$.

4.2 RQ1 – Effects of Professional Competence on Classroom Management Quality

Table 5 reports the bivariate correlations between knowledge, self-efficacy, situation-specific skills, and classroom management quality aggregated at the class level. The correlation matrix showed a moderate positive correlation between knowledge and rule clarity as well as a low negative correlation between rating items and monitoring. Regarding situation-specific skills, we found a moderate correlation between the rating items and the open assessment of interpretation.

4 In the following, only the term *rating items* is used to distinguish the interpretation measured by rating items from the interpretation in the written analytic comments.

Table 5: Intercorrelations between variables on the classroom level

	1	2	3	4	5	6	7	8	9
Dispositions									
(1) Classroom management knowledge[a]									
(2) Self-efficacy[b]	-.05								
Situation-specific skills									
(3) Rating items[a]	.08	.10							
(4) Perception[a]	.05	.02	.20						
(5) Interpretation[a]	.11	.17	.30**	.11					
(6) Decision-making[a]	-.07	-.08	-.14	.19	-.19				
Classroom management quality									
(7) Monitoring[c]	.01	-.02	-.24*	-.13	-.13	.02			
(8) Managing momentum[c]	.05	-.01	-.22	-.19	.00	-.15	.40**		
(9) Rule clarity[c]	.34**	.04	-.02	-.02	-.12	.01	.42***	.34***	
(10) Student behavior[c]	.10	.08	-.15	.01	.01	-.04	.14	.76***	.14

Note. [a]$N = 73$, [b]$N = 72$, [c]$N = 79$; * $p < .05$. ** $p < .01$. *** $p < .001$.

Tables A1a-A1d in the Appendix show the results of the single models of the two-level linear regression analysis for each predictor variable. Contrary to our expectations, there was no significant relationship (H1a). In the multivariate models there was only a negative significant relationship between the rating items and the student rating on managing momentum (Table A1b). When all predictors were included simultaneously in an overall model, only the control variables gender, age, language background and teacher popularity remained partly significant (Table A2).

Except for the one above mentioned, neither the closed task format nor the open task format measuring situation-specific tasks predicted the student ratings; therefore, situation-specific skills showed no direct effects on classroom management quality, meaning that hypothesis H1b was not confirmed.

4.3 RQ 2 – Situation-specific Skills as Mediators Between Dispositions and Classroom Management Quality

The condition of a significant relationship between classroom management knowledge or self-efficacy and the situation-specific skills or between the situation-specific skills and classroom management quality was not met. A further calculation of the indirect effect was therefore not carried out. H2a and H2b had to be therefore be rejected.

5. Discussion

The aim of our study was to investigate the relationships between pre-service teachers' dispositions, situation-specific skills, and instructional quality with a focus on classroom management and to examine the assumed mediation of situation-specific skills for the relationship between dispositions and classroom management quality. In addition, the data should provide a differentiated perspective on the role of closed (via rating items) and open (via written analytic comments) task formats of situation-specific skills.

5.1 Main Findings

Contrary to our expectations (H1a, H1b), our data did not support the theoretically derived relationships proposed by Blömeke et al. (2015) in the context of classroom management with regard to pre-service teachers. Bivariate correlations indicated that knowledge of classroom management seems to be an important prerequisite for a pre-service teacher to be able to establish clear rules and routines. Surprisingly, the rating items were even negatively correlated with monitoring. In the multivariate model, after controlling for student characteristics such as gender, age, language background, and teacher popularity, the rating items showed a negative effect on managing momentum.

Previous research has shown that the correlations between professional knowledge and situation-specific skills tend to be lower for less experienced participants than for more experienced teachers (Müller & Gold, 2023). Similarly, while existing studies show only inconsistent correlations between situation-specific skills and classroom management quality among experienced teachers (Gold et al., 2021; König et al., 2021; König & Kramer, 2016), they have shown none at all among beginning teachers (Junker et al., 2021). Experienced teachers benefit from a more targeted perception of relevant classroom events than less experienced teachers due to stronger interconnections and knowledge integration when it comes to teaching experience in dealing with complex teaching situations (Berliner, 2001). Through practical experiences and deliberate practice, these knowledge structures enable them to establish effective classroom management. In contrast, pre-service teachers have probably not yet had enough opportunities to link their knowledge and their situation-specific skills with concrete situations and experiences in practice, so that no relationships to their classroom management quality could emerge. This might also explain why particularly for monitoring and managing the classroom, negative relationships were found. While pre-service teachers may be able to recognize these strategies, they often struggle to implement them effectively due to the multiple simultaneous demands of actual teaching situations. Moreover, pre-service teachers typically enter an already established system of rules and routines that may have been set up by the regular classroom teacher, so there is less measurement of their own ability to implement it. Therefore, it is important to repeat

the study with in-service teachers to gain further insights into the relationships between dispositions, situation-specific skills, and instructional quality. However, the absence of correlations could also indicate different competence profiles with different strengths and weaknesses among the pre-service teachers, which could be addressed using cluster analysis (Müller & Gold, 2025).

Another explanation could be the use of student ratings. Although commonly used to assess instructional quality (van der Scheer et al., 2019), their validity may be limited with pre-service teachers. Besides those aspects of classroom management that are important in the process of a lesson (as withitness or overlapping), effective classroom managers begin to build and establish structures in the first weeks of the school year (Emmer et al., 1980; Evertson et al., 2006). So students may have rated their regular class teacher rather than the pre-service teacher – possibly explaining the overall high ratings. Future studies should include experienced teachers in their own classrooms and apply a multimethod approach (e. g., student and observer ratings) (Blömeke et al., 2022). In addition, IRT-based weighting of student responses may provide more accurate results than simple sum scores (van der Scheer et al., 2019).

A third explanation relates to the specific focus on classroom management. To date, only the study by Junker et al. (2021) examined the assumed relationship between dispositions, situation-specific skills and instructional quality with a focus on classroom management; the findings were inconsistent, and the authors did not conduct a mediation analysis. König et al. (2021) included students' mathematical progress as a dependent variable in their chain of effects and found inconsistent findings regarding classroom management and no evidence of mediation regarding the basic dimensions of instructional quality for the correlation between pedagogical competence (the sum of knowledge and skills) and student learning. In contrast, studies in mathematics education (e. g., Blömeke et al., 2022) have found clearer pathways, including mediating effects of situation-specific skills and instructional quality on student learning.

Our findings suggest that these relationships may be less distinct in classroom management – a generic rather than subject-specific domain. A systematic investigation of the assumed chain of effects from a generic and subject-specific perspective with interactions between generic and subject-specific perspective would, therefore, be desirable and is highly relevant for the future development of instructional quality research, as well as the design of training for future teachers. In addition, it would also be relevant to include student learning as a dependent variable.

5.2 Limitations

The focus of our study was on situation-specific skills, which, with one exception, did not correlate with each other (rating items and interpretations from the written analytical comments). These findings are consistent with previous research and raise questions about the convergent validity of instruments used to assess situa-

tion-specific skills. Some studies have reported low or zero correlations when the same processes were measured using different assessment methods (e. g., Frommelt et al., 2019) or when different processes within situation-specific skills were examined in relation to each other (e. g., König et al., 2014). Individual strengths and weaknesses in different skill components may explain the weak correlations (e. g., Jacobs et al., 2022; Müller & Gold, 2025). For instance, some individuals may identify many relevant events but struggle to interpret them appropriately, while others may offer deep and appropriate interpretations but recognize only a limited number of relevant events. More ecologically valid formats, such as video-based eye-tracking or VR-based observation tasks, might reduce methodological bias (e. g., Grub et al., 2020; Kosko et al., 2022).

One common procedure for measuring classroom management quality is the use of student ratings. Because of the COVID-19 pandemic, the pre-service teachers were only allowed to conduct the student survey independently in their classes. Under these conditions, teaching was generally restricted and the possibility of influencing students through verbal or nonverbal communication cannot be ruled out, even though an implementation manual was available. Furthermore, it was not possible to ensure the extent to which students had been taught in exactly this class most of the time, and therefore had already shared learning experiences and established a teacher-student relationship. However, the teacher-student relationship is crucial for classroom management (Obsuth et al., 2017) and particularly relevant when evaluating classroom management (Scherzinger & Wettstein, 2019).

In addition, the low reliabilities of the assessments of classroom management knowledge and classroom management quality in some scales may have underestimated the results of the present study. Similarly, the generalizability of the assessment of situation-specific skills is limited due to the use of videos with science topics; further tests would have to be carried out with different school types, subjects, and classroom situations. A final limitation of this study is the relatively small sample size, especially given the large number of predictors at level 2. This could reduce the statistical power and affect the stability of the estimates, which could further limit the generalizability of the results.

5.3 Conclusion

Despite certain limitations, the study contributes to our understanding of the role of pre-service teachers' dispositions and situation-specific skills for instructional quality in the context of classroom management. Future research should take an interdisciplinary perspective, as teachers must often integrate multiple foci (e. g., classroom management and instructional support) simultaneously. Findings by Dückers et al. (2022) underline the importance of both focus-specific and focus-integrated processes in situation-specific skills. To further develop the competence model by Blömeke et al. (2015), future studies should also consider broader affective-motivational dispositions and student learning outcomes.

Acknowledgement

We have no known conflicts of interest to disclose. This research did not receive any funding agencies in the public, commercial, or not-for-profit sectors.

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Appendix

Table A1a: *Predicting Monitoring Based on Pre-service Teachers' Dispositions (Regression Coefficients [Beta] and Standard Errors)*

	Monitoring models						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Within level	$N = 1167$	$N = 1144$	$N = 1167$	$N = 1167$	$N = 1167$	$N = 1167$	$N = 1144$
Gender[1]	.03 (.04)	.03 (.04)	.03 (.04)	.03 (.04)	.03 (.04)	.03 (.04)	.03 (.04)
Language background	.01 (.04)	.00 (.04)	.01 (.04)	.01 (.04)	.01 (.04)	.01 (.04)	.00 (.04)
Teacher popularity	.38*** (.04)	.38*** (.04)	.38*** (.04)	.38*** (.04)	.38*** (.04)	.38*** (.04)	.38*** (.04)
Age students	.06 (.04)	.06 (.04)	.06 (.04)	.06 (.04)	.06 (.04)	.06 (.04)	.06 (.04)
Between level	$k = 73$	$k = 72$	$k = 73$	$k = 73$	$k = 73$	$k = 73$	$k = 72$
Gender[2]	.19 (.11)	.18 (.11)	.19 (.11)	.20 (.11)	.20 (.11)	.19* (.11)	.18 (.11)
Language background	-.38*** (.10)	-.39*** (.10)	-.34*** (.09)	-.39*** (.10)	-.38*** (.09)	-.48*** (.10)	-.37*** (.10)
Teacher popularity	.63*** (.12)	.64*** (.12)	.61*** (.12)	.63*** (.12)	.63*** (.12)	.63*** (.12)	.63*** (.11)
Age students	.24 (.13)	.25* (.11)	.22* (.11)	.23* (.11)	.23* (.11)	.23* (.11)	.25 (.13)
Classroom management knowledge	.01 (.12)						.02 (.11)
Self-efficacy		.08 (.13)					.09 (.13)
Rating items			-.18 (.11)				-.22 (.12)
Perception				.06 (.10)			.09 (.10)
Interpretation					.02 (.17)		.06 (.11)
Decision-making						.00 (.13)	-.02 (.13)
R^2 (within)	.15	.15	.15	.15	.15	.15	.15
R^2 (between)	.56	.56	.59	.56	.56	.56	.56
Fit indices							
$\chi 2$	101.103	99.754	100.292	100.534	107.581	104.319	139.226
df	63	63	63	63	63	63	88
p	.002	.002	.002	.002	.000	.001	.000
CFI	.946	.945	.946	.946	.936	.940	.928
RMSEA	.023	.023	.023	.023	.025	.024	.023
SRMR within	.029	.029	.029	.029	.029	.029	.029
SRMR between	.089	.086	.086	.090	.097	.086	.098

Note. [1]covariates centered at the group mean, [2]covariates centered at the class level.
* $p < .05$.
** $p < .01$.
*** $p < .001$

Table A1b: *Predicting Managing Momentum Based on Pre-service Teachers' Dispositions (Regression Coefficients [Beta] and Standard Errors)*

	Managing momentum models						
	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
Within level	*N* = 1169	*N* = 1146	*N* = 1169	*N* = 1169	*N* = 1169	*N* = 1169	*N* = 1146
Gender[1]	.08*	.09*	.08*	.08*	.08*	.08*	.09*
	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)
Language background	-.08**	-.08**	-.08**	-.08**	-.08**	-.08**	-.08**
	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)
Teacher popularity	.61***	.61***	.61***	.61***	.61***	.61***	.61***
	(.03)	(.04)	(.03)	(.03)	(.03)	(.03)	(.04)
Age students	-.01	-.01	-.01	-.01	-.01	-.01	-.01
	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)
Between level	*k* = 73	*k* = 72	*k* = 73	*k* = 73	*k* = 73	*k* = 73	*k* = 72
Gender[2]	.05	.05	.05	.05	.05	.05	.04
	(.08)	(.08)	(.08)	(.08)	(.08)	(.08)	(.08)
Language background	-.31**	-.32**	-.26*	-.26**	-.32**	-.30**	-.27*
	(.11)	(.11)	(.12)	(.12)	(.11)	(.11)	(.12)
Teacher popularity	.84***	.86***	.83***	.84***	.85***	.84***	.85***
	(.09)	(.08)	(.09)	(.09)	(.09)	(.09)	(.09)
Age students	.32**	.31**	.29**	.30**	.30**	.30**	.33**
	(.10)	(.10)	(.10)	(.10)	(.10)	(.10)	(.11)
Classroom management knowledge	.04						.05
	(.10)						(.11)
Self-efficacy		.10					.12
		(.12)					(.11)
Rating items			-.18				-.21*
			(.10)				(.10)
Perception				-.16			-.15
				(.11)			(.11)
Interpretation					.09		.15
					(.08)		(.08)
Decision-making						.00	.05
						(.10)	(.11)
R^2 (within)	.38	.37	.38	.38	.38	.38	.37
R^2 (between)	.74	.75	.77	.76	.75	.74	.83
Fit indices							
χ2	128.032	120.472	126.286	123.364	124.445	124.157	152.483
df	46	46	46	46	46	46	66
p	.000	.000	.000	.000	.000	.000	.000
CFI	.911	.916	.913	.915	.915	.914	.907
RMSEA	.039	.038	.039	.038	.038	.038	.034
SRMR within	.044	.044	.044	.044	.044	.044	.044
SRMR between	.103	.095	.102	.098	.097	.103	.100

Note. [1]covariates centered at the group mean, [2]covariates centered at the class level.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table A1c: *Predicting Rule Clarity Based on Pre-service Teachers' Dispositions (Regression Coefficients [Beta] and Standard Errors)*

	Rule clarity models						
	Model 15	Model 16	Model 17	Model 18	Model 19	Model 20	Model 21
Within level	$N = 1166$	$N = 1143$	$N = 1166$	$N = 1166$	$N = 1166$	$N = 1166$	$N = 1143$
Gender[1]	.11*	.10*	.11**	.11**	.11**	.11**	.10**
	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)
Language background	.01	.00	.01	.01	.01	.01	.00
	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)
Teacher popularity	.32***	.31***	.32***	.32***	.32***	.32***	.31***
	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)
Age students	.10	.10*	.10*	.10*	.10	.10	.10*
	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)
Between level	$k = 73$	$k = 72$	$k = 73$	$k = 73$	$k = 73$	$k = 73$	$k = 72$
Gender[2]	.07	.07	.09	.09	.10	.08	.02
	(.15)	(.16)	(.16)	(.16)	(.16)	(.17)	(.15)
Language background	-.22	-.21	-.23	-.23	-.21	-.22	-.25
	(.18)	(.18)	(.17)	(.18)	(.17)	(.19)	(.19)
Teacher popularity	.59***	.60***	.59**	.59**	.58**	.61**	.63***
	(.18)	(.18)	(.19)	(.19)	(.20)	(.20)	(.19)
Age students	-.11**	-.21	-.21	-.22	-.23	-.23	-.07
	(.17)	(.18)	(.19)	(.19)	(.19)	(.18)	(.17)
Classroom management knowledge	.26						.29
	(.23)						(.28)
Self-efficacy		.07					.14
		(.15)					(.22)
Rating items			.10				.12
			(.17)				(.20)
Perception				.09			.08
				(.17)			(.21)
Interpretation					-.09		-.11
					(.16)		(.20)
Decision-making						.11	.13
						(.18)	(.18)
R^2 (within)	.12	.11	.12	.12	.12	.12	.11
R^2 (between)	.59	.51	.52	.53	.53	.55	.62
Fit indices							
$\chi 2$	45.554	43.023	40.839	43.479	41.436	39.865	62.570
df	31	31	31	31	31	31	46
p	.045	.074	.111	.068	.099	.132	.052
CFI	.961	.968	.973	.966	.972	.976	.957
RMSEA	.020	.018	.016	.019	.017	.016	.018
SRMR within	.021	.022	.021	.021	.021	.021	.022
SRMR between	.121	.113	.116	.119	.114	.111	.114

Note. [1]covariates centered at the group mean, [2]covariates centered at the class level.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table A1d: *Predicting Student Behavior Based on Pre-service Teachers' Dispositions (Regression Coefficients [Beta] and Standard Errors)*

	Student behavior models						
	Model 22	Model 23	Model 24	Model 25	Model 26	Model 27	Model 28
Within level	*N* = 1167	*N* = 1144	*N* = 1167	*N* = 1167	*N* = 1167	*N* = 1167	*N* = 1144
Gender[1]	.09**	.10**	.09**	.09**	.09**	.09**	.10**
	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)
Language background	-.03	-.03	-.03	-.03	-.03	-.03	-.03
	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)
Teacher popularity	.10***	.10***	.10***	.10***	.10***	.10***	.10***
	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)	(.03)
Age students	-.04	-.04	-.04	-.04	-.04	-.04	-.04
	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)	(.04)
Between level	*k* = 73	*k* = 72	*k* = 73	*k* = 73	*k* = 73	*k* = 73	*k* = 72
Gender[2]	-.06	-.07	-.07	-.06	-.06	-.06	-.07
	(.11)	(.12)	(.11)	(.11)	(.11)	(.11)	(.11)
Language background	-.06	-.09	-.04	-.07	-.06	-.06	-.07
	(.12)	(.13)	(.12)	(.12)	(.12)	(.12)	(.13)
Teacher popularity	.28*	.30*	.27*	.28*	.28*	.27*	.28*
	(.13)	(.13)	(.13)	(.13)	(.13)	(.13)	(.12)
Age students	.00	-.01	-.03	-.03	-.02	-.02	.02
	(.14)	(.13)	(.13)	(.13)	(.13)	(.13)	(.14)
Classroom management knowledge	.05						.06
	(.13)						(.13)
Self-efficacy		.15					.15
		(.13)					(.13)
Rating items			-.10				-.14
			(.13)				(.14)
Perception				.04			.06
				(.11)			(.12)
Interpretation					.03		.03
					(.12)		(.14)
Decision-making						-.06	-.06
						(.11)	(.12)
R^2 (within)	.02	.02	.02	.02	.02	.02	.02
R^2 (between)	.09	.10	.09	.09	.09	.09	.13
Fit indices							
χ2	113.041	123.971	106.987	112.542	113.362	117.142	162.345
df	63	63	63	63	63	63	88
p	.000	.000	.001	.000	.000	.000	.000
CFI	.970	.963	.973	.970	.970	.967	.958
RMSEA	.026	.029	.024	.026	.026	.027	.027
SRMR within	.021	.021	.021	.021	.021	.021	.021
SRMR between	.063	.067	.064	.065	.066	.073	.068

Note. [1]covariates centered at the group mean, [2]covariates centered at the class level.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table A2: *Predicting Classroom Management Quality Based on Pre-service Teachers' Dispositions (Regression Coefficients [Beta] and Standard Errors)*

	Classroom management quality model			
	Monitoring	Managing momentum	Rule clarity	Student behavior
Within level		$N = 1146$		
Gender[1]	.04	.09*	.10**	.10**
	(.04)	(.04)	(.04)	(.04)
Language background	.00	-.08**	.00	-.03
	(.04	(.03)	(.03)	(.03)
Teacher popularity	.39***	.60***	.31***	.11**
	(.04)	(.04)	(.04)	(.03)
Age students	-06	-.02	.10*	-.04
	(.04)	(.03)	(.04)	(.04)
Between level		$k = 72$		
Gender[2]	.16	-.01	.10	-.08
	(.12)	(.09)	(.13)	(.12)
Language background	-.36***	-.21	-.20	-.06
	(.10)	(.11)	(.21)	(.13)
Teacher popularity	.62***	.72***	.61***	.26*
	(.11)	(.14)	(.22)	(.12)
Age students	.24	.24	-.06	.02
	(.14)	(.14)	(.19)	(.14)
Classroom management knowledge	-.01	.08	.23	.06
	(.11)	(.12)	(.28)	(.13)
Self-efficacy	.09	.09	.11	.15
	(.13)	(.13)	(.19)	(.13)
Rating items	-.22	-.24	.13	-.14
	(.12)	(.20)	(.19)	(.14)
Perception	.09	-.08	.11	.07
	(.11)	(.12)	(.23)	(.12)
Interpretation	.06	.15	-.07	.03
	(.11)	(.10)	(.22)	(.14)
Decision-making	-.02	-.08	.14	-.07
	(.13)	(.12)	(.17)	(.12)
R^2 (within)				
Monitoring		.15		
Managing momentum		.37		
Rule clarity		.11		
Student behavior		.02		
R^2 (between)				
Monitoring		.58		
Managing momentum		.63		
Rule clarity		.53		
Student behavior		.12		
Fit indices				
$\chi 2$		1339.481		
df		604		

	Classroom management quality model			
	Monitoring	Managing momentum	Rule clarity	Student behavior
p		.000		
CFI		.854		
RMSEA		.033		
SRMR within		.047		
SRMR between		.145		

Note. [1]covariates centered at the group mean, [2]covariates centered at the class level.
* $p < .05$.
** $p < .01$.
*** $p < .001$.