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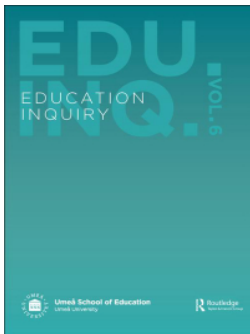
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Classroom management and teacher emotions in secondary mathematics teaching: a qualitative video-based single case study

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ABSTRACT

Classroom management is an emotionally demanding task for mathematics teachers, especially if students exhibit frequent discipline problems. Intense classroom conflicts can result in persistent latent emotional dispositions, such as fear or anger, that teachers are not directly aware of but that have a strong influence on their classroom management. However, little is known about the relationship between mathematics teachers' latent emotions and their classroom management strategies. This paper reports on findings from an exploratory, video-based single case study in an urban secondary school in Germany. One mathematics double lesson (95 minutes in total) was videotaped to conduct a depth-hermeneutical analysis of identified classroom management strategies and the corresponding latent teacher emotions. The results suggest that mathematics teachers use classroom management strategies not only to establish orderly lessons but also to regulate intense latent emotions that arise during classroom teaching.

ARTICLE HISTORY


KEYWORDS

Classroom management; teacher emotions; mathematics; case study; video analysis

Introduction

Classroom management is a central component of high-quality instruction with direct links to various social and academic student outcomes (Pianta & Hamre, 2009). Its central aim is to create a functioning learning environment by preventing undesirable student behaviours and enforcing desirable ones. This is especially relevant in “difficult” classes where teachers experience frequent student misbehaviour and unwillingness to cooperate (Hochweber, Hosenfeld, & Klieme, 2014). To achieve successful classroom management, four key strategies are required: Dealing with disruptions and discipline problems; effective use of time and increasing time on task; monitoring students and establishing clear rules; and routines (Praetorius, Klieme, Herbert, & Pinger, 2018).

These strategies are relevant across different school subjects (Praetorius et al., 2020). For example, expertise in classroom management has been shown to affect student gains in mathematics between grades 7 and 8 (König et al., 2021; Toropova, Johansson, & Myrberg, 2019) and is associated with student-teacher relatedness and student enjoyment (Hettinger, Lazarides, Rubach, & Schiefele, 2021). Therefore, expertise in

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classroom management is considered an important component of mathematics teaching.

The development of classroom management expertise is likely a staged process that takes many years of professional training and practical experience (Emmer & Stough, 2001). During lessons, teachers observe how different students respond to different classroom management strategies and adjust their behaviours accordingly. This learning process is characterised by discontinuities and setbacks, and teachers are not only challenged to manage difficult student behaviours but also their own negative emotions that occur during this process (Sutton, Mudrey-Camino, & Knight, 2009). Teachers usually feel more intense negative emotions when confronted with student misbehaviour as compared to student achievement problems because they attribute misbehaviours to students' laziness or lack of effort (Wang & Hall, 2018). Therefore, teachers not only alter their classroom management strategies to establish order in the classroom but also to cope with their negative emotional responses to student misbehaviour. However, little is known about this specific affective aspect of classroom management (Emmer & Stough, 2001).

Teacher emotions and classroom management

When teaching in a classroom, the varying emotions that arise can influence both teacher behaviour and classroom management (Hagenauer, Hascher, & Volet, 2015). For instance, a study among 127 English teachers found significant positive relationships between teachers' feelings of enjoyment and anger and self-reported self-efficacy in classroom management. The effect of teacher anger was unexpected, but the authors hypothesise that students reacted to the teachers' anger by showing more discipline, and teachers rated this as an indicator of the effectiveness of their classroom management (Mikyong & van Vlack, 2018). Further, a study among 559 secondary teachers found significant positive relationships between teachers' general abilities to regulate their emotions and their self-reported discipline management in the classroom. The authors conclude that teachers who are able to regulate negative emotions effectively also know better how to address student needs and implement proactive classroom management strategies (Valente, Lourenço, Alves, & Dominguez-Lara, 2020).

These studies contribute to the understanding of the role of teacher emotions in shaping teachers' classroom management strategies. In spite of these findings, Sutton and Wheatley (2003) highlight two critical research limitations that apply to the aforementioned studies. First, these studies only use self-report to assess teacher emotions. While self-report is suitable for assessing emotions that are salient enough to be recalled, it is less suitable for assessing non-salient, latent emotions that arise during daily classroom experiences. Consequently, the authors conclude that future studies on teacher emotions should include observations to extend the limited scope of self-reports. Second, teacher emotions may work differently across different school subjects. Therefore, they suggest that future research focus on teacher emotions and its effects across different subjects. To address these limitations, the present study uses observational data to explore the way in which latent emotions shape the classroom management strategies of secondary mathematics teachers.

Latent emotions in mathematics teaching

Latent emotions are conceptually embedded in the research on mathematics teachers and learner identities. Within this specific field of research, psychoanalytic theory is used as one of the conceptual frameworks to define the latent emotions that impact mathematic identity (Darragh, 2016). According to this line of research, salient emotions can be remembered and recalled by teachers and these emotions can be directly linked to individual teaching behaviours and habits. At the same time, teaching behaviours and habits also serve to suppress non-salient or latent emotions, such as anger or fear, that are subsequently acted out or projected outwards (Panksepp, 1999).

Salient and latent emotions are both inherent in social interactions such as classroom teaching. In contrast to salient emotions, latent emotions can hardly be recalled by individuals; nevertheless, they exert a distinct pressure on the social interaction since they are tension-filled and sometimes contradictory with regard to the normative structure of the setting. They are rooted in difficult past experiences that can be triggered in the present moment (Bereswill, Morgenroth, & Redman, 2010).

In-depth analyses of narrative interviews, for example, have shown that undergraduate mathematics students often overemphasise positive aspects of their mathematical identities and at the same time suppress unconscious negative emotions, such as anger or sadness, that arise from contradictory or uncomfortable biographical and social experiences with their mathematics peers (Bartholomew, Darragh, Ell, & Saunders, 2011). Research on mathematics teacher educators has come to similar conclusions (Black, Mendick, & Solomon, 2009). Educators of mathematics teachers adopt identities of being mathematics lovers or haters in order to protect themselves against latent anxieties that arise from processes of assessment and selection in mathematics higher education.

A one-year-long observational study in elementary maths classes shows how these identities are enforced by teachers during everyday lessons in school (Stearns, 2019). During these classes, teachers established linear curricular trajectories in order to promote mathematics mastery among the students. These trajectories tended to be labelled “learner-centered” approaches but also served as protection against the curious and desirous impulses of students who questioned the norms of the teacher’s mathematical identity. A study among mathematics teachers from Germany similarly concluded that overemphasising subject-knowledge and strict curricular trajectories in mathematics teaching can minimise the emotional demands of teaching children mathematics (Keller-Schneider, 2020).

While latent emotions and suppression of these emotions have typically been studied in relation to the formation of mathematical identities and curricular trajectories, they have less often been studied as factors influencing classroom management in mathematics teaching. Given the existing empirical evidence for the relationship between teachers’ self-reported salient emotions and their classroom management (Mikyoung & van Vlack, 2018; Valente et al., 2020), it might be hypothesised that latent emotions also influence the way in which mathematics teachers apply different classroom management strategies, and that these strategies also serve to regulate teachers’ negative latent emotions arising from difficult classroom experiences. Since secondary teachers are more likely to perceive stress from poor student attitudes and misbehaviour than

primary teachers (Kavita & Hassan, 2018), they also more likely depend on this regulative function of classroom management. Taken together, these hypotheses concerning the relationship between latent teacher emotions and classroom management beg the following research question: How are classroom management strategies related to the latent emotions of a teacher in a secondary mathematics double lesson?

Method

Study design

To permit an exploratory, in-depth investigation of the relationship between classroom management and latent teacher emotions in a real-life classroom setting, the present study applied a single case study design. Single case study designs are suitable for drawing hypotheses from qualitative analyses of single field observations and deriving future research questions (Harrison, Birks, Franklin, & Mills, 2017). Studies that conduct in-depth analysis of single observations can be highly informative and meaningful (Boddy, 2016). Despite various methodological limitations, single case studies are especially useful in exploring complex teaching processes in real-life settings (Rittberg & Van Kerkhove, 2019), such as latent emotions and classroom management.

Video-based observations

To make the single case accessible for in-depth analysis and to capture the complexity of classroom teaching, video recording technology was used for the major data collection process. Video recordings can significantly support exploratory case study designs because they allow for a repeated and holistic analysis of multimodal aspects of classroom situations (Jewitt, 2012).

Video-based observational studies are frequently used in research on mathematics teaching and classroom management. A study by Jacobs and Empson (2016), for example, used videotaped lessons to analyse an elementary mathematics teacher's responsive teaching strategies. Video-based observations are also a valid approach to the measurement of teacher emotions (Keller, Chang, Becker, Goetz, & Frenzel, 2014; Reizezein, Junge, Studtmann, & Huber, 2014; Zembylas, 2005) and significantly correlate with students' and teachers' own perspectives (Donker, van Vemde, Hessen, van Gog, & Mainhard, 2021). Video-based observations were recently used to study student emotions (Cekaite & Ekström, 2019) and teacher emotions (Akpovo, Neessen, Nganga, & Sorrells, 2021; Uzuntiryaki-Kondakci, Kirbulut, Oktay, & Sarici, 2021).

In terms of single case study designs, defining the number observations is mostly an adaptive process of methodological reasoning (Sim, Saunders, Waterfield, & Kingstone, 2018). The guiding principle behind this reasoning should be the concept of Saturation that takes different theoretical and contextual factors into account (Saunders et al., 2018). Two factors seemed especially relevant to address empirical saturation with regard to the intended video-based case study design. On one hand, video-based observations are a very costly and invasive data collection process (Kilburn, 2014). It is also emotionally challenging for the participants, which makes recruiting particularly difficult (Asan & Montague, 2014; Themessl-Huber et al., 2008). On the other hand, Praetorius, Pauli, Reusser,

Rakoczy, and Klieme (2014) investigated how many video-based observations are necessary to make reliable statements about classroom management and student-teacher relationships. Their results demonstrate that these content-independent aspects of teaching hardly vary between lessons. Therefore, they suggest that one video-based observation per teacher is sufficient to measure classroom management and student-teacher relationships accurately. Prominent qualitative and quantitative video-based classroom studies rely on single observations to make inferences about different social dynamics between a teacher and his students (Garrote et al., 2020; Grootenboer & Edwards-Groves, 2019; Jacobs & Empson, 2016; Moser Opitz et al., 2020; van der Kleij, 2021). Considering these different contextual and theoretical factors, the researcher decided to recruit one secondary mathematics teacher and to record one double lesson (95 minutes in total) of this teacher on video for the further in-depth analysis.

Instruments

To assess additional social and emotional characteristics of the participating students, the study used an additional teacher rating questionnaire that covered different aspects of the teaching climate, such as discipline problems and emotionality (Dann et al., 2014). The questionnaire contained 46 items on a 4-point *Likert* scale, ranging from 1 (strongly disagree) to 4 (strongly agree). Items distributed among five different aspects of the teaching climate:

- (a) *Social relations between students*, 14 items ($\alpha = 0.97$; e.g. “Students in this class help each other”);
- (b) *Aggression against the teacher*, 12 items ($\alpha = 0.93$; e.g. “This class is aggressive towards the teacher”);
- (c) *Cooperation with the teacher*, 7 items ($\alpha = 0.85$; e.g. “Students in this class do particularly well during lessons”);
- (d) *Disciplinary violations*, 8 items ($\alpha = 0.93$; e.g. “I have an unusual amount of discipline problems with this class”) and
- (e) *Emotionality*, 5 items ($\alpha = 0.84$; e.g. “The students in this class could keep their emotional outbursts in check a bit more”).

Participants

The study was conducted with the voluntary collaboration of one secondary mathematics teacher. This male teacher works at a public urban community school in Germany. He is a university graduate and a fully certified secondary in-service teacher. He also has 6 years of practical experience teaching mathematics and geography. A 9th grade class with 14 students with an average age of 15 years (8 males and 6 females) also participated in this study.

Procedure

All secondary schools in a metropolitan area in Germany were invited via email to participate in the study. The email contained detailed information about the study purpose, the data collection process and a mandatory data protection plan. One secondary mathematics teacher responded to this invitation and gave his written consent. The teacher decided which class to include. He asked all of the students and their parents for permission. The mandatory procedures by the Federal School Department were followed, especially regarding data protection and participants' written consent to participate (teacher, students and students' parents also agreed to have their children participated in this study). After permission was granted by the Federal School Department, the data collection process began.

A few days before the video recording started, the teacher was asked to rate the teaching climate in the participating class. Eventually, one mathematics double lesson (95 minutes in total) of the participating teacher and the chosen class was recorded with two cameras in February 2019. One camera followed the movement of the teacher in the classroom and the other camera focussed on the students.

Data analysis

Coding classroom management strategies

The author identified and coded scenes in which the teacher applied distinct classroom management strategies, such as dealing with disruptions and discipline problems, effective use of time and increasing time on task, monitoring students and establishing clear rules and routines (Praetorius et al., 2018). If the teacher responded to disruptions or discipline problems, the scene was coded as "dealing with disruptions and discipline problems". If the teacher communicated targeted times or managed transitions between tasks, the scene was coded as "effective use of time and increasing time on task". Any scenes in which the teacher monitored students (e.g. addressing students directly, talking to them personally) were coded as "monitoring students". If a scene depicted certain established classroom routines (e.g. greeting rituals, taking materials) or if the teacher enforced or reminded the students of classroom rules, it was coded as "establishing clear rules and routines".

Depth-hermeneutical group interpretations

Since latent emotions exert a non-salient, unconscious influence on individual teaching behaviours (Bereswill et al., 2010; Panksepp, 1999), they cannot be assessed directly through self-report. For this reason, the present study used group-based depth-hermeneutics as a qualitative research method to investigate latent emotions that are excluded from or act beyond the level of the immediate social interaction and communication (Gripsrud, Mellon, & Ramvi, 2018). Lorenzer (1986) introduced the concept of depth-hermeneutics as a way to apply processes of psychoanalysis to cultural research. According to Lorenzer (2006), the psychoanalyst uses a particular mode of understanding – called scenic understanding – to perceive the patient's culturally rejected patterns, forbidden yearnings, suppressed desires and emotions. Apart from obvious expressions and meta-communicative content, scenic understanding focusses

on the psychoanalyst's counter-transferences to the narrative expressions that are laid out by the patient during the consultation. From these counter-transferences, the psychoanalyst deduces theories about the patient's unconscious interaction forms, (e.g. suppressed desires), that influence his everyday life and may produce intense ambivalence or even conflicts in his social relations. Lorenzer (1986) extrapolated this approach to the understanding of texts, language and human behaviour. In this application, the researcher uses his own reactions, emotional states and associations towards the data material (e.g. interview transcripts, observation protocols or videos) as indications of latent meaning within the displayed verbal expressions or social interactions. Scenic understanding of this latent meaning and its relation to the manifest meaning of the data is then used to address specific research questions.

Different scholars have used Lorenzer's theory to derive hermeneutic methodologies for research in the cultural and social sciences (e.g. König, 2001; Leithäuser & Volmerg, 1988). The scenic interpretation procedure is most often organised in a group. What has been described as a dyadic psychoanalytical process is now arranged as a collective understanding process in which reactions and associations of different interpreters come together. The group discussion goes through several stages, from an open exchange of individual reactions to a debate on different interpretations and finally a critical reflection (Salling Olesen & Weber, 2012). In this depth-hermeneutical process, conflicting or controversial expressions by participants of the group discussions are understood as subjective indicators for the latent meaning of the data material (e.g. suppressed desires) and not as objective value judgements towards the depicted persons (Bereswill et al., 2010). The researcher himself should be present during the discussion and take notes but should not verbally engage, so that he does not influence the discussion through his academic preconceptions of the subject (Coule, 2018). In the further analysis and writing phase, the researcher has to summarise and re-contextualise the different themes that occurred during the group discussion with regard to the research question and the broader academic debate (Salling Olesen & Weber, 2012). He also has to reinterpret controversial expressions that occurred during the discussion and translate these in a scientific understanding process. This eventually leads to a holistic but preliminary, multi-layered interpretation of the discussed material that is exclusively established by the researcher (Pile, 1990). Phoenix et al. (2016) describe how such group-based analysis methods help to make interpretations of qualitative data more robust and identify interpretations that are provoked by the researcher's personal involvement in the research process.

The present study applied a depth-hermeneutic procedure that was introduced by König (2000). A group of 4 experienced researchers from disciplines such as educational science and psychology participated in the discussion on the videotaped double lesson. These researchers are all part of an on-going, voluntary methods group that is specialised in depth-hermeneutics and frequently analyses classroom materials. Each participant watched the videotaped double lesson individually without any specific instruction or framework in mind. They were only asked to take notes of spontaneous reactions and emotional responses to the video. Next, all of the researchers met to discuss their notes and reflect on specific scenes of interest for two hours. As mentioned above, the researcher was present during this discussion and took notes but did not actively engage. He also audio recorded the discussion in order to supplement his notes. After the discussion, the

researcher compared the group interpretations with the previously identified scenes in which the teacher applied specific classroom management strategies. The insights from these comparisons made it possible to draw hypothetical inferences about the relationship between the mathematics teacher's classroom management strategies and the specific latent emotions observed during the videotaped double lesson.

Results

Ratings of teaching climate

The participating teacher in this study strongly agreed that his class frequently demonstrated aggression towards the teacher and committed disciplinary violations. Therefore, the conditions for teaching in this class were assumed to be very challenging, as far as the teaching climate was concerned.

Description of the videotaped double lesson

The videotaped double lesson starts with a greeting ritual. The students stand up from their chairs and greet the teacher by saying, "Good Morning, Mr. X". The double lesson focuses on mathematic word problems to prepare the students for the final examinations. After a general introduction, the teacher demonstrates a specific method to solve word problems in front of the class. After this instruction he asks the students to solve different word problems on their own, using this specific method, and to discuss the results with their seat neighbours. During this task, he walks through the classroom and helps individual students. He also reacts to off-task behaviours and disruptions. Finally, he invites the students to present their solutions in front of the class and gives corrective feedback to the presenters.

Coding of classroom management strategies

The author used a holistic coding process to identify various classroom management strategies used by the teacher during the double lesson. For example, the greeting ritual at the beginning was coded as "establishing clear rules and routines". During the individual task and the partner work, several scenes were coded as "monitoring students". There were a few scenes in which the teacher reacted to student noise. In two scenes the teacher reacted to students who were not working on the task or were playing games on their smart phones. These scenes were labelled as "dealing with disruptions and discipline problems". Transitions between different parts of the double lesson were labelled as "effective use of time and increasing time on task".

Taken together, all four key classroom management strategies (Praetorius et al., 2018) were identified in the videotaped double lesson through the holistic coding process, but "monitoring students" was identified most frequently.

Depth-hermeneutical interpretations of selected classroom management strategies

This subchapter describes in detail scenes in which a specific classroom strategy was identified that were also addressed during the depth-hermeneutical group discussion. Later, corresponding depth-hermeneutical interpretations of these selected scenes are summarised.

The greeting ritual

At the beginning of the videotaped double lesson, the teacher sits in front of the class with his hands crossed. At first he smiles, but his smile suddenly fades. He carefully watches the students sitting at their tables, taking off their jackets and arranging their materials. There is still a lot of loud talk between the students. He starts counting the students and then begins to change the seating arrangements. Some students are asked to sit in the back while others have to sit in front. After all the students sit down and stop talking, the teacher stands up and shuts the door. He stands behind his chair and instructs the students with a waving of his hand to stand up. He greets them with an emphasised friendliness and then all students greet him back by saying “Good Morning, Mr. X” in unison but in different tones (e.g. some students include random noises in their greeting). Then all of the students sit down again while the teacher remains standing and starts the double lesson.

Group interpretation

The depth-hermeneutical group began their critical discussion of the described greeting ritual at the beginning of the videotaped double lesson. This particular greeting ritual is very common in German classrooms. Some participants agreed that this ritual helps to establish solidarity between the students and the teacher and to focus the students’ attention. At the same time, the participants of the depth-hermeneutical group also felt irritated by this scene and reported negative emotional responses, such as anger and fear. They shared the opinion that certain non-verbal aspects of this scene caused these negative emotional responses.

To begin with, the teacher’s dictatorial hand gesture and the over-emphasised friendliness in his voice made him appear angry during this greeting ritual. The participants argued that this hand gesture and tone of voice did not imply solidarity but rather demonstrated the teacher’s authority by infantilizing the students and making them stand up for him. This reassured him that he was in control of the whole class and that all of the students would follow his command. Second, the students appeared to be fearful of openly resisting the teacher’s orders and only dared to indicate their reluctance through non-verbal connotations of their greeting. They did not stand properly, made noises and used very slow, deep-pitched voices that indicated a lack of motivation.

After discussing different interpretations of this opening scene further, the group finally concluded that the teacher’s angry gesture and the students’ subtle resistance demonstrated a latent authority conflict or power struggle between the teacher and the students. In this conflict, the teacher’s anger may have been caused by his fear of losing control of the class and being exposed to misbehaviours and discipline violations.

Given the ambiguous reactions to the ritual, this conclusion seemed plausible to all participants of the discussion.

Monitoring a student's word problem solving

After the greeting ritual, the teacher demonstrated a specific strategy to solve mathematical word problems and advised the students to use it rigorously. After this instruction, the students solved word problems on their own, using the strategy. While the students worked individually, the teacher walked across the room to monitor the students' progress. One student in the middle of the classroom seemed to ignore the teacher's instruction and tried to solve the word problem with his own strategy. The teacher arrived at this table and looked at the student's work. He asked the student to follow the instruction and to use the teacher's strategy. He left the student and walked across the room again. After a while he approached the same student again and asked him another time to use his strategy. The student replied that he solved the word problem, but the teacher ignored his approach and insisted that he had to use the teacher's strategy to systematically solve the word problem. The teacher left again and returned to the student. They argued again but seemingly could not come to an agreement. At the end of this individual task work, the student presented his solution in front of the class. He explained that he had found a correct answer to the word problem with his own strategy, but the teacher reprehended him for not using the suggested strategy.

Group interpretation

The depth-hermeneutical group proceeded to have a long discussion about the sequences showing the student and teacher argue about the right strategy to solve the word problems. On one hand, the group thought that the teacher was very attentive towards the student's progress and quickly reacted to his failure. The group also felt frustrated and angry about the student's resistance towards the proposed strategy. They assumed that the teacher put a lot of effort into the planning of this task and that his relentless attempts to make the student use his strategy demonstrated how eager he was to create a successful double lesson. But from the group's point of view, the teacher not only feared that the double lesson would go differently than planned but that he also felt personally offended by the student's lack of appreciation for his efforts. Apart from his desire for a successful double lesson, they also thought the teacher was seeking a general recognition for his work.

On the other hand, some participants of the depth-hermeneutical group showed an empathy towards the student's behaviour. They considered that the student made an effort to solve the word problem in his own way and his resistance towards the teacher's requests demonstrated his desire for self-determination and recognition. Instead of labelling this behaviour as deviant, they suggested that the teacher could have appreciated the student's motivation and encouraged him to be innovative. Instead, they felt that the teacher's constant reproaches provoked the opposite reaction. The group concluded that the student might have felt intimidated by the teacher's monitoring, leading not only to his growing resistance but also to a fading intrinsic motivation.

Examining these two interpretations, the group summarised that the teacher and the student both seemed to struggle for recognition but failed to establish an appreciative

compromise that would save them both from a loss of face. As a result, they both intensified their opposing behaviours and ultimately ended up in a vicious cycle. But since the teacher possessed more power in the classroom, he could maintain his authority by publicly correcting the student and reinforcing his strategy. The group argued that this specific struggle for recognition underlied the teacher's monitoring behaviour and the student's reactions. From the group's point of view, the progress of this scene was driven by negative emotional responses, such as anger and fear, that resulted from a failure to grant each other recognition and prevent a loss of face.

Monitoring students' partner work

After solving the word problem with the teacher's strategy, the students were asked to discuss their results with their seat neighbours. Two seat neighbours, a boy and a girl, did not follow this instruction. Instead, they silently worked in their books without talking to each other. The teacher approached them and asked them to collaborate but they did not seem to follow. After a while the teacher approached them again but they still did not work together. The girl especially seemed to ignore the teacher's request, while the boy indicated his willingness to start the partner work. Finally, the teacher approached the girl directly and asked why she did not want to discuss with her neighbour. She did not reply. He asked her to at least compare her results with her neighbour, but the girl replied, "I'd rather not". The teacher's face turned grim and he answered the girl, "We will have to talk about this in general terms, after the lesson". After saying this, he walked away.

Group interpretation

The conversation between the teacher and the girl provoked a discussion in the depth-hermeneutical group about the meaning of the girl's behaviour and the teacher's specific reaction to it. Again, some participants in the group felt frustrated about the girl's behaviour, as she seemingly refused to work with her neighbour without any obvious reason or argument. Some participants also critically remarked that the boy might feel insulted by her rejection. Other participants, however, thought that the girl was very courageous to verbally refuse the teacher's orders.

On the other hand, all the participants were irritated by the hostile connotation of the teacher's final sentence, which seemed to them to be a threat. By requesting that she have a personal conversation on "general terms", the teacher was indicating that he would punish her not just for this specific incident but also for an unknown quantity of other violations. This provoked fear in some participants of the depth-hermeneutical group. They also wondered why the teacher did not simply respect the girl's boundaries and instead violated her boundaries by requesting that she have a personal conversation outside of the safe classroom community.

In the group's opinion, these intense emotional responses contrasted with this seemingly minor incident. They concluded that a personal conflict between the teacher and the girl underlied their conversation. The teacher may have experienced frequent non-compliance by this girl and feared in this instance that he might experience a similar response. Since she refused to follow his orders, his anger may have accumulated into a latent aggression that, in turn, resulted in the girl's fear of punishment and her ambiguous verbal attempt ("I'd rather not".) to avoid the partner work.

Discussion

According to the ratings the teacher provided of the classroom climate prior to the observed double lesson, he experienced more frequent aggression and disciplinary problems in the class, as compared to ratings by an independent sample of 1176 German teachers (Dann et al., 2014). Since these types of misbehaviours tend to provoke very intense negative emotions (Wang & Hall, 2018), the teacher had likely also to deal with anger, fear, and other such emotions in the past. According to the research on teacher emotions (Bartholomew et al., 2011; Bereswill et al., 2010; Black et al., 2009; Stearns, 2020), the teacher may not have always been fully aware of these emotions, especially if they were in conflict with his professional norms or reached a certain level of intensity. Even in the absence of actual student misbehaviours, these emotions may have arisen because they were rooted in past memories that could be triggered by minor classroom incidents. Given these features of latent emotions (Panksepp, 1999), it seems plausible that they were present in the videotaped double lesson and also influenced the teacher's classroom management.

Various scenes were identified in which the teacher used different classroom management strategies. The depth-hermeneutical group interpretations of these scenes indicated that certain interpersonal conflicts between the teacher and the students overshadowed their classroom interactions and provoked latent emotions that were not directly articulated. Although all three scenes were unique and involved different students, they had a certain feature in common. Namely, the teacher's classroom management strategies demonstrated a subtle angriness. This was evident in the dictatorial hand gesture to initiate the greeting ritual, the relentless criticism and the verbal boundary violations towards the students. Fear of losing control or of not gaining recognition was also a very salient sentiment among the participants of the group discussion that could be linked to the teacher's angriness. Taken together, the comprehensive interpretation of these scenes suggested that the angriness of the teacher's classroom management strategies may have been caused by this latent fear of losing control of the class or not gaining recognition for his work. Hence, the observed classroom management strategies not only served to create an orderly double lesson but may have also helped the teacher to regulate his fear and anger.

Mikyong and van Vlack (2018) reported an unexpected relationship between teacher anger and self-efficacy in classroom management. The present findings, however, offer an alternative explanation for this result. Anger is certainly an effective component for classroom management that increases students' obedience. At the same time, the depth-hermeneutical analysis suggests that classroom management is also an effective strategy to deal with angriness and subsequent fear. Adding to the research by Valente et al. (2020), self-regulation is not just a predisposition for effective classroom management; classroom management is also an effective way to practice regulation of negative emotions that follow student misbehaviour.

The depth-hermeneutical analysis also indicated possible contradictions between the academic and the self-regulative functions of classroom management. With regard to the greeting ritual, making the students stand up and collectively greet the teacher might have assured him that he was in control, but this did not seem personalised and collaborative enough to promote a thriving classroom community (Shields-Lysiak,

Boyd, Iorio, & Vasquez, 2020). On the other hand, rigorously monitoring the students and insisting on an exact task completion might have served to regulate the teacher's fear of losing control, though this seem implausible since the task could be completed without correcting the students. Appreciating the students' innovations or setting boundaries could have facilitated their motivation and compliance with the teacher's feedback (Böheim et al., 2021), but since fear and anger are very intense emotions and the teacher himself was not aware of them in the present moment, he might have instead reacted instinctively without considering alternative options.

Regarding the central research question, we can hypothesise a self-regulative function of classroom management. The videotaped secondary mathematics teacher dealt with the latent fear of losing control or not gaining recognition by using certain classroom management strategies. Since he did not reflect on this fear and simply reacted to it, he may have missed chances to motivate his students and establish a constructive classroom dialogue.

Limitations

The present study has several limitations. First, a single case study design was chosen to address the relatively new topic of teacher emotions and classroom management. This study design allowed an in-depth analysis of real-life classroom interactions, but only in a single case. Therefore, the present results are only valid regarding this specific case and cannot reasonably be generalised to other disciplines or settings (Rittberg & Van Kerkhove, 2019). Second, instead of relying on interview transcripts or field notes, this study used video recordings to conduct a depth-hermeneutical analysis of classroom management strategies in a real-life setting. Research participants are often reluctant to take part in video recordings due to potential ethical issues (Themessl-Huber et al., 2008). Additionally, research on reactivity effects of video-based classroom research also suggests that teachers perceive more negative emotions when they are observed by video cameras (Praetorius, McIntyre, & Klassen, 2017). Therefore, the reported latent teacher emotions might have also been a consequence of the fact that the teacher felt angry or fearful of the cameras and not of certain student behaviours.

Conclusions

The present single case study contributes to the new field of research on teacher emotions and classroom management by highlighting the important role of teachers' latent fear and anger. Despite the aforementioned limitations, this study adds to the existing body of research and provides novel hypotheses for the self-regulative function of classroom management. Future research should analyse this specific function of classroom management by examining more cases and gathering additional data from other sources. Adding more contrasting or supporting cases would enhance the validity of the interpretations and allow for more generalisable conclusions. For instance, stimulated recall from teachers would make it possible to control the group's interpretations and assess any reactivity effects of the cameras.

The present findings explore how latent fear and anger affect teachers' classroom management and potentially result in a non-dialogic classroom climate. Teachers need

additional emotional support to cope with these intense negative emotions and to use classroom management strategies more constructively.

Disclosure statement

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Notes on contributor

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References

- Akpovo, S. M., Neessen, S., Nganga, L., & Sorrells, C. (2021). Staying with discomfort: Early childhood teachers' emotional themes in relation to children's peer-culture aggression. *Contemporary Issues in Early Childhood*, 146394912110423. doi:10.1177/14639491211042376
- Asan, O., & Montague, E. (2014). Using video-based observation research methods in primary care health encounters to evaluate complex interactions. *Informatics in Primary Care*, 21(4), 161–170.
- Bartholomew, H., Darragh, L., Ell, F., & Saunders, J. (2011). 'I'm a natural and I do it for love!': Exploring students' accounts of studying mathematics. *International Journal of Mathematical Education in Science and Technology*, 42(7), 915–924.
- Bereswill, M., Morgenroth, C., & Redman, P. (2010). Alfred Lorenzer and the depth-hermeneutic method. *Psychoanalysis, Culture & Society*, 15(3), 221–250.
- Black, L., Mendick, H., & Solomon, Y. (2009). Mathematical relationships in education: Identities and participation. In L. Black, H. Mendick, and Y. Solomon (Eds.), *Mathematical relationships in education: Identities and participation* (pp. 19–32). New York & London: Routledge. doi:10.4324/9780203876114
- Boddy C Roland. (2016). Sample size for qualitative research. *QMR*, 19(4), 426–432. 10.1108/QMR-06-2016-0053
- Böheim, R., Schnitzler, K., Gröschner, A., Weil, M., Knogler, M., Schindler, A.-K., ... Seidel, T. (2021). How changes in teachers' dialogic discourse practice relate to changes in students' activation, motivation and cognitive engagement. *Learning Culture and Social Interaction*, 28, 1–14.
- Cekaite, A., & Ekström, A. (2019). Emotion socialization in teacher-child interaction: Teachers' responses to children's negative emotions. *Frontiers in Psychology*, 10(1546). doi:10.3389/fpsyg.2019.01546
- Coule, T. M. (2018). Group Methods. In C. Cassell, A. L. Cunliffe, and G. Grandy Eds., *The SAGE handbook of qualitative business and management research methods: Methods and challenges* (pp. 117–132). London: SAGE Publications Ltd. <https://www.doi.org/10.4135/9781526430236.n8>

- Dann, H., Humpert, W., Krause, F., Von Kügelgen, T., Rimele, W., & Tennstädt, K. (2014). *Subjektive Zufriedenheit und Belastung von Arbeit und Beruf*. Mannheim: Zusammenstellung sozialwissenschaftlicher Items und Skalen (ZIS). doi:10.6102/zis15
- Darragh, L. (2016). Identity research in mathematics education. *Educational Studies in Mathematics*, 93(1), 19–33.
- Donker, M. H., van Vemde, L., Hessen, D. J., van Gog, T., & Mainhard, T. (2021). Observational, student, and teacher perspectives on interpersonal teacher behavior: Shared and unique associations with teacher and student emotions. *Learning and Instruction*, 73, 101414.
- Emmer, E. T., & Stough, L. M. (2001). Classroom management: A critical part of educational psychology, with implications for teacher education. *Educational Psychologist*, 36(2), 103–112.
- Garrote, A., Felder, F., Krähenmann, H., Schnepel, S., Sermier Dessemontet, R., & Moser Opitz, E. (2020). Social acceptance in inclusive classrooms: The role of teacher attitudes toward inclusion and classroom management. *Frontiers in Education*, 5(198). doi:10.3389/educ.2020.582873
- Gripsrud, B. H., Mellon, K., & Ramvi, E. (2018). Depth-hermeneutics: A psychosocial approach to facilitate teachers' reflective practice? *Reflective Practice*, 19(5), 638–652.
- Grootenboer, P., & Edwards-Groves, C. (2019). Learning mathematics as being stirred into mathematical practices: An alternative perspective on identity formation. *ZDM: The International Journal on Mathematics Education*, 51(3), 433–444 (412 Seiten).
- Hagenauer, G., Hascher, T., & Volet, S. E. (2015). Teacher emotions in the classroom: Associations with students' engagement, classroom discipline and the interpersonal teacher-student relationship. *European Journal of Psychology of Education*, 30(4), 385–403.
- Harrison, H., Birks, M., Franklin, R., & Mills, J. (2017). Case study research: Foundations and methodological orientations. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, 18(1). doi:10.17169/fqs-18.1.2655
- Hettinger, K., Lazarides, R., Rubach, C., & Schiefele, U. (2021). Teacher classroom management self-efficacy: Longitudinal relations to perceived teaching behaviors and student enjoyment. *Teaching and Teacher Education*, 103(3), 103349.
- Hochweber, J., Hosenfeld, I., & Klieme, E. (2014). Classroom composition, classroom management, and the relationship between student attributes and grades. *Journal of Educational Psychology*, 106(1), 289–300.
- Jacobs, V. R., & Empson, S. B. (2016). Responding to children's mathematical thinking in the moment: An emerging framework of teaching moves. *ZDM Mathematics Education*, 48(12), 185–197.
- Jewitt, C. (2012). *An introduction to using video for research*. National Centre for Research Methods (Working Paper 03/12). <http://eprints.ncrm.ac.uk/2259/>
- K. K and Hassan N Che. (2018). Work Stress among Teachers: A Comparison between Primary and Secondary School Teachers. *IJARPED*, 7(4), 10.6007/IJARPED/v7-i4/4802
- Keller-Schneider, M. (2020). Das Verständnis von Unterricht und Vermittlungsanforderungen von Lehrpersonen im Berufseinstieg – Ausdifferenzierung der fallorientierten qualitativen Inhaltsanalyse und Triangulation mit quantitativen fallorientierten Ergebnissen. *Forum Qualitative Sozialforschung*, 21(1). doi:10.17169/fqs-21.1.3452
- Keller, M. M., Chang, M.-L., Becker, E. S., Goetz, T., & Frenzel, A. C. (2014). Teachers' emotional experiences and exhaustion as predictors of emotional labor in the classroom: An experience sampling study. *Frontiers in Psychology*, 5, 1442.
- Kilburn, D. (2014) *Methods for recording video in the classroom: Producing single and multi-camera videos for research into teaching and learning*. NCRM Working Paper. NCRM. <https://eprints.ncrm.ac.uk/id/eprint/3599/>
- König, H. D. (2000). Tiefenhermeneutik. In U. Flick, E. Von Kardorff, & I. Steinke (Eds.), *Qualitative Forschung. Ein Handbuch* (pp. 556–569). Reinbek bei Hamburg: Rowohlt.
- König, H. D. (2001). A neo-Nazi in Auschwitz. A psychoanalytic reconstruction of a documentary film on right-wing extremism. *Forum: Qualitative Social Research*, 2(3). doi:10.17169/fqs-2.3.905

- König, J., Blömeke, S., Jentsch, A., Schlesinger, L., Felske Née Nehls, C., Musekamp, F., & Kaiser, G. (2021). The links between pedagogical competence, instructional quality, and mathematics achievement in the lower secondary classroom. *Educational Studies in Mathematics*, 107(1), 189–212.
- Leithäuser, T., & Volmerg, B. (1988). *Psychoanalyse in der sozialforschung. Eine einföhrung*. Opladen: Westdeutscher Verlag.
- Lorenzer, A. (1986). Tiefenhermeneutische Kulturanalyse. In A. Lorenzer (Ed.), *KulturAnalysen: Psychoanalytische Studien zur Kultur* (pp. 11–98). Frankfurt am Main: Fischer.
- Lorenzer, A. (2006). *Szenisches Verstehen. Zur Erkenntnis des Unbewußten*. Marburg: Tectrum Verlag.
- Mikyoung, L., & van Vlack, S. (2018). Teachers' emotional labour, discrete emotions, and classroom management self-efficacy. *Educational Psychology*, 38(5), 669–686.
- Moser Opitz, E., Schnepel, S., Krähenmann, H., Jandl, S., Felder, F., & Dessemontet, R. S. (2020). The impact of special education resources and the general and the special education teacher's competence on pupil mathematical achievement gain in inclusive classrooms. *International Journal of Inclusive Education*, 1(17). doi:10.1080/13603116.2020.1821451
- Panksepp, J. (1999). Emotions as viewed by psychoanalysis and neuroscience: An exercise in consilience. *Neuropsychoanalysis*, 1(1), 15–38.
- Phoenix, A., Brannen, J., Elliott, H., Smithson, J., Morris, P., Smart, C., ... Bauer, E. (2016). Group analysis in practice: Narrative approaches. *Forum: Qualitative Social Research*, 17(2). <http://nbn-resolving.de/urn:nbn:de:0114-fqs160294>
- Pianta, R. C., & Hamre, B. K. (2009). Conceptualization, measurement, and improvement of classroom processes: Standardized observation can leverage capacity. *Educational Researcher*, 38(2), 109–119.
- Pile, S. (1990). Depth hermeneutics and critical human geography. *Environment and Planning D: Society and Space*, 8(2), 211–232.
- Praetorius, A. K., McIntyre, N. A., & Klassen, R. M. (2017). Reactivity effects in video-based classroom research: An investigation using teacher and student questionnaires as well as teacher eye-tracking. *Zeitschrift Für Erziehungswissenschaft*, 20(S1), 49–74.
- Praetorius, A.-K., Herrmann, C., Gerlach, E., Zülsdorf-Kersting, M., Heinitz, B., & Nehring, A. (2020). Unterrichtsqualität in den Fachdidaktiken im deutschsprachigen Raum – Zwischen Generik und Fachspezifik. *Unterrichtswissenschaft*, 48(3), 409–446.
- Praetorius, A.-K., Klieme, E., Herbert, B., & Pinger, P. (2018). Generic dimensions of teaching quality: The German framework of three basic dimensions. *ZDM: The International Journal on Mathematics Education*, 50(3), 407–426.
- Praetorius, A.-K., Pauli, C., Reusser, K., Rakoczy, K., & Klieme, E. (2014). One lesson is all you need? Stability of instructional quality across lessons. *Learning and Instruction*, 31, 2–12.
- Reisezein, R., Junge, M., Studtmann, M., & Huber, O. (2014). Observational approaches to the measurement of emotions. In R. Pekrun, and L. Linnenbrink-Garcia (Eds.), *International handbook of emotions in education* (pp. 580–606). New York: Routledge. doi:10.4324/9780203148211
- Rittberg, C. J., & Van Kerkhove, B. (2019). Studying mathematical practices: The dilemma of case studies. *ZDM Mathematics Education*, 51(5), 857–868.
- Salling Olesen, H., & Weber, K. (2012). Socialization, language, and scenic understanding. Alfred Lorenzer's contribution to a psycho-societal methodology. *Forum Forum: Qualitative Social Research*, 13(3). doi:10.17169/fqs-13.3.1906
- Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., ... Jinks, C. (2018). Saturation in qualitative research: Exploring its conceptualization and operationalization. *Quality & Quantity*, 52(4), 1893–1907.
- Shields-Lysiak, L., Boyd, M., Iorio, J., Jr, & Vasquez, C. (2020). Classroom greetings: More than a simple hello. *Iranian Journal of Language Teaching Research*, 8(3), 41–56.
- Sim, J., Saunders, B., Waterfield, J., & Kingstone, T. (2018). Can sample size in qualitative research be determined a priori? *International Journal of Social Research Methodology*, 21(5), 619–634.

- Stearns C. (2020). Show your work: math curricula, knowledge, and rehumanizing pedagogy. *Pedagogy, Culture & Society*, 28(2), 299–315. [10.1080/14681366.2019.1635191](https://doi.org/10.1080/14681366.2019.1635191)
- Stearns, C. (2019). Show your work: Math curricula, knowledge, and rehumanizing pedagogy. *Pedagogy, Culture & Society*, 28(2), 299–315.
- Sutton, R. E., Mudrey-Camino, R., & Knight, C. C. (2009). Teachers' emotion regulation and classroom management. *Theory Into Practice*, 48(2), 130–137.
- Sutton, R. E., & Wheatley, K. F. (2003). Teachers' emotions and teaching: A review of the literature and directions for future research. *Educational Psychology Review*, 15(4), 327–358.
- Themessl-Huber, M., Humphris, G., Dowell, J., Macgillivray, S., Rushmer, R., & Williams, B. (2008). Audio-visual recording of patient-GP consultations for research purposes: A literature review on recruiting rates and strategies. *Patient Education and Counseling*, 71(2), 157–168.
- Toropova, A., Johansson, S., & Myrberg, E. (2019). The role of teacher characteristics for student achievement in mathematics and student perceptions of instructional quality. *Education Inquiry*, 10(4), 275–299.
- Uzuntiryaki-Kondakci, E., Kirbulut, Z. D., Oktay, O., & Sarici, E. (2021). A qualitative examination of science teachers' emotions, emotion regulation goals and strategies. *Research in Science Education*. doi:[10.1007/s11165-020-09986-y](https://doi.org/10.1007/s11165-020-09986-y)
- Valente, S., Lourenço, A. A., Alves, P., & Dominguez-Lara, S. (2020). The role of teacher's emotional intelligence for efficacy and classroom management. *Revista CES Psicología*, 13(2), 18–31.
- van der Kleij, F. (2021). Teacher and student perceptions of oral classroom feedback practices: A video-stimulated recall study. *The Australian Educational Researcher*. doi:[10.1007/s13384-021-00478-0](https://doi.org/10.1007/s13384-021-00478-0)
- Wang, H., & Hall, N. C. (2018). A systematic review of teachers' causal attributions: Prevalence, correlates, and consequences. *Frontiers in Psychology*, 9, 1–22.
- Zembylas, M. (2005). Beyond teacher cognition and teacher beliefs: The value of the ethnography of emotions in teaching. *International Journal of Qualitative Studies in Education*, 18(4), 465–487.