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Teachers' occupational well-being in relation to teacher–student interactions in primary school

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ABSTRACT: Teachers experience various demands in their job, and teachers' well-being has become a concern. However, less is known about how teachers' positive and negative aspects of teachers' occupational well-being are related to their quality of interactions with students, at the lower primary school classrooms. This study explored the relation between teachers' occupational well-being and teacher–student interactions in primary school classrooms in Finland. 49 Grade 2 teachers rated their work engagement and burnout, and quality of teacher–student interactions was rated by trained coders using the Classroom Assessment Scoring System (CLASS K-3) based on video-recorded lessons. Results of structural equation modelling showed that teachers with higher levels of work engagement showed higher-quality emotional support and instructional support, while teachers with higher levels of burnout potentially evidenced lower-quality instructional support. It is suggested that more attention should be paid to teachers' positive aspects of occupational well-being in teacher education programs and schools.

Keywords: *occupational well-being, teacher–student interactions, work engagement, burnout*

Introduction

Teaching is cross-nationally regarded as a stressful and demanding profession (Herman et al., 2018; Kyriacou, 2001). The literature has shown that teachers experience various demands in their job, for instance, high level administrative tasks (Organisation for Economic Co-operation and Development [OECD], 2020) and intensive accountability (Craig, 2017), which can lead to having a negative impact on their occupational well-being (Perryman & Calvert, 2020). The demands of teaching were found to be associated with a sense of negative occupational well-being, specifically, the experience of burnout, which, in turn, is linked to their interactions with students, namely, lower-quality classroom organization (Virtanen et al., 2018). Conversely, teachers' positive occupational well-being, as reflected by their level of work engagement, has a positive relation to the quality of their interactions with students (Soininen et al., 2023).

Theoretically, the associations between teacher occupational well-being and teacher–student interactions were approached from the lenses of the Prosocial Classroom Model (Jennings & Greenberg, 2009), the Job Demands-Resources model (JD-R; Schaufeli & Bakker, 2004), and Teaching Through Interactions framework (TTI; Hamre et al., 2013). In classroom context, the well-being and socio-emotional functioning of teachers may significantly influence their ability to develop and sustain warm and supportive interactions with students, to manage time and behaviors in classroom, and to support students' learning (Jennings & Greenberg, 2009). The possible links between teachers' occupational well-being and quality of their interactions with students as an indicator of job performance could also be derived from the balance of job demands and resources (Schaufeli & Bakker, 2004). Regarding quality of interactions between teacher and students, TTI framework provides a holistic understanding of classroom dynamics by capturing the emotional, organizational, and instructional aspects of teacher-student interactions (Hamre et al., 2013).

The current study aimed at contributing to the existing literature by investigating self-rated positive and negative aspects of teachers' occupational well-being, namely, work engagement and burnout, in relation to the observed quality of teacher–student interactions at early primary school classrooms. As previous research has recommended using observations to obtain a more comprehensive understanding of the dynamic nature of classroom interactions (Corbin et al., 2019), the observational instrument developed based on the TTI framework, namely the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008), was employed in the current study.

Moreover, the study focused on these associations in Grade 2 as it contributes to our understanding of the important continuum in children's early schooling, that is, from early childhood education (Finnish National Agency for Education [EDUFI], 2022) to pre-

primary (Finnish National Agency for Education [EDUFI], 2014) and early primary school (Finnish National Agency for Education [EDUFI], 2016), which is the critical developmental period in children's scholastic life.

Teachers' occupational well-being

This study focused on one key dimension of well-being, namely occupational well-being, which is used to describe individuals' evaluations of different aspects of their job (van Horn et al., 2004). The sense of occupational well-being is known to be formed on the basis of different types of positive and negative aspects related to one's job (Cumming, 2017; Schaufeli & Bakker, 2004). The present study explored teachers' experiences of work engagement and burnout in order to gain a deeper understanding of both the positive and negative aspects of their occupational well-being.

Work engagement is conceptualized as the persistent and pervasive affective–cognitive state in which individuals feel a sense of energetic and effective connection with their work activities and perceive themselves as capable of completely dealing with the demands of their job (Schaufeli et al., 2002). Work engagement could be caused by sufficient resources at work (Schaufeli & Bakker, 2004). According to Schaufeli et al. (2002), the construct of work engagement consists of three dimensions: vigor, dedication, and absorption. Based on their descriptions of the dimensions, teachers who exhibited high levels of vigor could be marked by a reservoir of energy and mental resilience while teaching, a willingness to invest effort in their work, and a persistent drive to overcome obstacles. Teachers who experienced dedication, in turn, could be seen as possessing a sense of significance, enthusiasm, inspiration, pride, and challenge in their teaching practice. Finally, teachers with a high level of absorption could be characterized by complete concentration and deep absorption in teaching, with time seeming to pass quickly and difficulties in detaching themselves from work. Research has shown that teachers' engagement in their work was positively associated with their job performance in terms of fulfilling the teaching job (Bakker & Bal, 2010) and with other positive aspects of occupational well-being, including job satisfaction (Høigaard et al., 2012). In addition, it was shown that teachers' higher work engagement is associated with their students' higher academic achievement (Wang, 2022). Further, work engagement was negatively related to job burnout (Høigaard et al., 2012). However, less is known how work engagement is related to the quality of interactions in authentic classroom settings.

Burnout is conceptualized as a persistent state of ill-being related to work (Feldt et al., 2014; Maslach et al., 1997) and is seen as an erosion of engagement (Schaufeli et al., 2002). The burnout syndrome has three main components: emotional exhaustion, cynicism, and professional inadequacy (Feldt et al., 2014; Maslach et al., 1997). Burnout is usually experienced as a result of prolonged stress (Maslach et al., 2001), which could be caused

by excessive demands or insufficient resources at work (Schaufeli & Bakker, 2004) or a lack of suitable coping methods (Lazarus & Folkman, 1984). According to the descriptions of the three main components (Feldt et al., 2014; Maslach et al., 1997), teachers with emotional exhaustion would be expected to experience a depletion of emotional energy and chronic fatigue. Those who experience cynicism would be likely to develop a negative and distant attitude towards their work. Finally, teachers with professional inadequacy, could perceive that their ability to fulfill their job responsibilities has declined.

The abovementioned positive and negative aspects of teachers' occupational well-being can be seen through the lens of the Job Demands-Resources Model (Schaufeli & Bakker, 2004), which suggests that occupational well-being is built on a basis of different demands and resources typical of a specific occupation. First, in the motivational process, abundant job resources foster the positive work-related state of mind in respect to work engagement. Work engagement as a mediator then further fosters one's job commitment and performance (e.g., interactions with students), either in an extrinsic manner (e.g., the achievement of work goals) or intrinsic manner (e.g., satisfaction of basic needs) (Schaufeli & Taris, 2014). However, in the health impairment process, high job demands and low job resources could lead to burnout. Burnout then acts as a mediator and further lead to health problems, such as cardiovascular issues and depression. In addition, there are also links between the two processes. For example, job resources are negatively related to job demands. Work engagement can also reduce job demands, and job resources can reduce burnout (Schaufeli & Bakker, 2004).

While the JD-R model included the interrelation between the two pathways described above (Schaufeli & Bakker, 2004), previous studies indicated the interrelationship between work engagement and burnout (e.g. Holmström et al., 2023; Nerstad et al., 2019). This study focuses on the two aspects of occupational well-being, teacher's work engagement and burnout, to further understand their relations with teachers' performance in the classroom. To be specific, this study tested teacher work engagement and burnout in separate models to better understand how each construct relates to the quality of teacher-student interactions.

Teacher–student interactions

To investigate the quality of teacher–student interactions, the present study draws on a widely acknowledged and empirically tested framework called Teaching through Interactions (TTI; Hamre et al., 2013). The TTI framework posits that daily interactions between teachers and students play a critical role in supporting the learning and development of students (Hamre et al., 2013; Pianta et al., 2008). The observational instrument of Classroom Assessment Scoring System (CLASS) has been developed based

on the TTI framework and enables one to observe and assess teacher-student interactions conceptualized in TTI (Pianta et al., 2008).

TTI encompasses classroom dynamics through three domains, namely: emotional support, classroom organization, and instructional support. The first domain, emotional support, is based on attachment theory (Bowlby, 1969) and self-determination theory (Deci & Ryan, 1985). High-quality emotional support can be seen, for example, in warm and caring communications represented in teacher–student interactions (Hamre et al., 2013). The second domain, classroom organization, focuses on promoting self-regulation (Blair, 2003). High-quality classroom organization can be seen, for example, in the management of time and routines which foster students' learning opportunities and desirable behavior (Hamre et al., 2013). The third domain, instructional support, emphasizes the provision of scaffolding and high-quality feedback to enhance students' higher order thinking skills and language development (Hamre et al., 2013; Pianta et al., 2008). High-quality instructional support is evidenced in such things as the use of instructional discussions and activities which promote deeper understanding instead of rote learning (Hamre et al., 2013).

Teacher–student interaction is widely acknowledged as a fundamental means to facilitate student learning and development across different school levels (Allen et al., 2013; Hamre et al., 2013). Specifically considering the primary classroom context, the TTI framework has been employed to explore the connections between interaction quality and a range of student characteristics and learning outcomes, such as literacy and mathematic development (Pakarinen et al., 2017a; Pakarinen et al., 2017b; Cadima et al., 2010), social behavior (Merritt et al., 2012; Soininen et al., 2023), and externalizing behaviors (Hoglund et al., 2015).

In addition to the aforementioned TTI framework, there are also alternative models and instruments that can be used to conceptualize and capture effective teacher-student interactions in a classroom. One example is constructivist learning theory (Phillips, 1995; Prawat & Floden, 1994) and behaviorist view of teaching and learning (Ertmer & Newby, 1993; Stipek & Byler, 2004). An observational instrument developed based on these theoretical underpinnings is the Early Childhood Classroom Observation Measure (ECCOM) which focuses on child-centered vs. teacher-directed teaching practices in terms of management, climate, and instruction (Stipek & Byler, 2004). Another example of an instrument focusing on components of instruction that are grounded in a constructivist view of learning and teaching is Framework for Teaching (FFT; Danielson, 2007). FFT is applicable to all school subjects. In turn, an instrument measuring the overall quality of the learning environment (including structural characteristics) is Early Childhood Environment Rating Scale (ECERS-R; Harms et al., 1998). While these other models and measures have been used to examine various aspects of instruction in educational

settings, TTI framework and CLASS instrument were chosen for the present study to conceptualize and operationalize teacher-student interactions because of its comprehensive approach and wide empirical support (Hamre et al., 2013).

Previous literature on teachers' occupational well-being in relation to teacher–student interactions

Some earlier studies have provided certain findings on how the domains of observed teacher-student interactions are related to teacher work engagement and burnout. First, concerning the quality of emotional support in the classrooms, Braun et al. (2018) confirmed the negative association between teachers' perceived burnout and quality of emotional support (effect size = 0.28, p <.05) when controlling for example for teacher gender, years teaching, and school type across grade 6–8 classrooms. Similarly, emotional exhaustion among teachers was found to have a negative association with emotional support (effect size = – 0.35, p <.05) with no control variables at the preschool level in Jennings's (2015) study. Second, concerning the quality of classroom organization, a recent study found that teacher work engagement was positively associated with subsequent quality of classroom organization (effect size = 0.25, p<.05) when controlling for example for class size and work experience in grade 1 classrooms (Soininen et al., 2023). Further, Hoglund et al. (2015) disclosed that among teachers of kindergarten to grade 2, there was a reciprocal relation between perceived burnout and observed quality of classroom organization (B = 0.43, p ≤ .05) when controlling for example for class size, and work experience at between level. In addition, Virtanen et al. (2018) focused on 12-year-old Finnish students who were in grade 6 and attending their final year of primary school and found that teachers' exhaustion at work was negatively correlated with quality of classroom organization (effect size = – 0.33, p < .05) when controlling for example for work experience and class size. Similarly, Braun et al. (2018) confirmed the negative association between teachers' perceived burnout and quality of classroom organization (effect size = – 0.31, p <.05) when controlling for example for teacher gender, years teaching and school type across grade 6–8 classrooms. Third, concerning the quality of instructional support, according to Penttinen et al.'s (2020) investigation, there is a positive association between kindergarten teachers' work engagement and observed instructional support (effect size = 0.34, p <.001) when controlling for example for group size and teacher work experience. Further, emotional exhaustion among teachers was found to have a negative association with instructional support (effect size = – 0.41, p <.05) at the preschool level in Jennings' (2015) study.

Based on previous studies, when examining the relations between teachers' occupational well-being and teacher-student interactions, it is important to take into account the possible role of some control variables. For example, it should be noted that teacher gender can correlate with experiences of stress, classroom organization, and instructional

support (Chan et al., 2024). Additionally, previous research indicates that white female teachers are more likely to exhibit lower occupational health profiles compared to white male teachers (Braun et al., 2022). Previous research also suggests that teacher higher work experience is associated with better classroom organization (Slot et al., 2015). Furthermore, larger group sizes have been associated with less emotional support and lower-quality classroom organization. Additionally, class size has been found to interact with both emotional and instructional supports (Allen et al., 2013). Including these teacher and classroom characteristics is therefore essential for model testing also in the current study.

Research examining the impact of teachers' occupational well-being on work-related contextual factors, such as teachers' social relations with others, is sorely needed (Hascher & Waber, 2021). However, investigations conducted in the lower primary school classroom context were mostly focusing on teachers' burnout (e.g., Hoglund et al., 2015), and research on relations between work engagement and interactions, remain scarce (for an exception, see Soininen et al., 2023). Thus, the current study investigated these associations in grade 2 classrooms.

The aim of the present study

The above review of previous research indicated that only a few existing studies investigated the relation between the observed quality of teacher–student interactions and the positive and negative aspects of teachers' occupational well-being at the primary school level. The present study aimed to bridge the literature gap by investigating the negative and also positive aspects of teachers' occupational well-being in relation to the quality of observed teacher–student interactions in the lower primary school classroom context. Consequently, this study aimed to examine teachers' occupational well-being in terms of teacher work engagement and burnout and their association with the three domains of quality of teacher–student interactions, namely, emotional support, classroom organization, and instructional support, in grade 2 classrooms. The following research questions (RQs) were formulated:

> RQ1. To what degree does teacher's experience of work engagement (i.e., vigor, dedication, absorption) relate to the quality of teacher–student interactions?
>
> RQ2. To what degree does teacher's experience of work-related burnout (i.e., emotional exhaustion, cynicism, inadequacy) relate to the quality of teacher–student interactions?

In relation to the first hypothesis (Hypothesis 1), the anticipation was to observe positive association between teachers' work engagement and all three domains of interaction

quality: emotional support (Hypothesis 1a: Job Demands-Resources model; Schaufeli & Bakker, 2004) classroom organization (Hypothesis 1b: Soininen et al., 2023), and instructional support (Hypothesis 1c: Penttinen et al., 2020).

In relation to the second hypothesis (Hypothesis 2), the anticipation was to observe negative association between teachers' burnout and all three domains of interaction quality: emotional support (Hypothesis 2a: Braun et al., 2018; Jennings, 2015), classroom organization (Hypothesis 2b: Braun et al., 2018; Hoglund et al., 2015; Virtanen et al., 2018), and instructional support (Hypothesis 2c: Jennings, 2015).

Context of the study

The current study was conducted in Finland. A nine-year comprehensive schooling program (six years of primary education, three years of lower secondary education) is commenced free of charge when a child attains the age of seven. Early childhood education (ECE) and early primary grades constitute an important phase of development and learning for children. Together, the Finnish ECE and grades 1-2 (age range 0-8) is based on an integrated approach to care, education and teaching, with a particular emphasis on pedagogy. The aim of the Finnish national core curriculum for ECE and grades 1-2 is to promote children's holistic growth as a continuum of learning and development. For example, the curriculum for grades 1 and 2 of early primary school strongly focuses on basic academic and socio-emotional skills and self-regulation of the children (Finnish National Agency for Education [EDUFI], 2016). Also, understanding the importance and pedagogical possibilities of play for the child in the promotion of wellbeing and learning is essential until age 8 (grade 2) in the Finnish curriculum.

In Finland, the high professional competence of teachers (i.e., master's degree from a university) and child-centered teaching practices in which children are active learners during their early school years are seen as highly important (Lerkkanen et al., 2013).

Materials and methods

Participants and procedure

This study was part of the longitudinal Teacher Stress and Interaction in a Classroom study (TESSI; Lerkkanen & Pakarinen, 2016–2022) investigating links between teacher and student stress and classroom interaction. The Committee of Ethics of the University of Jyväskylä approved the study prior to its commencement, and the study conformed with the Declaration of Helsinki and followed the national guidelines of the Finnish National Board on Research Integrity (TENK, 2019).

For the study, 49 grade 2 teachers (46 female, 3 male) from different municipalities in Central Finland participated in the research. Questionnaires about the participants' background and occupational well-being were administered to the teachers. Video recordings of the classrooms were made to capture the quality of teacher–student interactions (2–4 lessons for each teacher on one school day, with each recording lasting for 20–45 minutes per lesson, a total of 4–10 episodes per teacher). The data were collected in the spring of 2019. The teachers were working as class teachers and were responsible for teaching various subjects. All teachers were qualified with a master's degree in education. Teachers' participation was voluntary, and their written consent was collected. Children's parents also provided written consent for their children's participation in the classroom video recordings.

Teachers were asked to rate the ethnic background of the students in their classrooms as follows: (1) mostly native Finnish students (over 80%), (2) approximately half native Finnish and half students with an immigrant background, and (3) predominantly students with an immigrant background (over 80%). All teachers in the current study reported that the ethnic background of their classrooms was mostly native Finnish students.

Measures

Work engagement

Teachers' experience of work engagement was measured using the Finnish version of the Utrecht Work Engagement Scale (UWES-9; Schaufeli et al., 2002; see also Seppälä et al., 2009) which captures the psychological state of work engagement. The UWES consists of 9 items that map three factors: vigor (3 items, α = .81; e.g., "At my work, I feel that I am bursting with energy."), dedication (3 items, α = .86; e.g., "I am enthusiastic about my job."), and absorption (3 items, α = .95; e.g., "I am immersed in my work."). 7-point Likert scale (1 = never; 7 = daily) was used, and mean scores for each of the three indicators were used in the analysis.

Burnout

To capture teachers' experiences of burnout, a shortened version of the Bergen Burnout Inventory (BBI-9; Feldt et al., 2014) validated for the Finnish context was employed. The BBI-9 consists of 9 items that map three factors: emotional exhaustion (3 items, α = .73; e.g., " I often sleep poorly because of the circumstances at work."); cynicism (3 items, α = .84; e.g., " I feel that I have gradually less to give."); and inadequacy (3 items, α = .72; e.g., " I frequently question the value of my work."). 6-point Likert scale (1 = completely disagree; 6 = completely agree) was used, and mean scores for each of the three indicators were used in the analysis.

Teacher–student interaction quality

This study evaluated the quality of interactions between teachers and students by using the Classroom Assessment Scoring System (CLASS K–3) measure (Pianta et al., 2008; see Pakarinen et al., 2010 for validation for the Finnish context). Following the TTI framework, the CLASS measure consists of three domains. Each of the domains is represented by its distinct dimensions (emotional support: positive climate, negative climate, teacher sensitivity, and regard for student perspectives; classroom organization: behavior management, productivity, and instructional learning formats; and instructional support: concept development, quality of feedback, and language modeling). 7-point Likert scale was used, with ratings ranging from low (1-2) to mid (3-5) to high (6-7).

For the current study, four to ten cycles were assessed per teacher, resulting in a total of 322 coded cycles. Each cycle had an average duration of 19 minutes and 32 seconds (Min = 10 min 15 sec, Max = 25 min 54 sec, SD = 3 min 06 sec). Five trained coders independently coded separate episodes of 20 min. Before commencing the actual coding, the coders were mandated to attain in the official reliability test and achieve a consensus of over 80% both among individual raters and across four or more master-coded episodes (Pianta et al., 2008). Double coding of 20% of the data was also performed with five coders on 62 episodes. Inter-rater reliability was calculated using the two-way random effects model with absolute agreement (Landers, 2015). All the 10 dimensions of the three interaction quality domains indicated moderate (αicc = 0.60–0.75), good (αicc = 0.75–0.90) or excellent (αicc = 0.90–1.00) reliability (Koo & Li, 2016). For the analysis, mean scores for the three domains were used in the data analysis. Cronbach's alphas were calculated for emotional support, classroom organization, and instructional support. The obtained coefficients for these constructs were .79, .75, and .82, respectively, indicating acceptable levels of internal consistency for each of these constructs.

Teachers' background characteristics

Teachers' gender (0 = male, 1 = female), teachers' work experience at schools (in years), and class size (number of students enrolled in the class) were tested as control variables in the further analyses.

Statistical analyses

Pearson correlations were calculated between teachers' background characteristics, two aspects of teachers' occupational well-being, and the three domains of teacher–student interactions. Structural equation modelling (SEM) with Mplus 8.8 (Muthén & Muthén, 1998) was used to investigate the extent to which the aspects of occupational well-being (work engagement and burnout) were related to the different domains of interaction quality (emotional support, classroom organization and instructional support). Work

engagement and burnout were run as a latent variable with each domain of interaction quality (i.e., six models in total). For work engagement, a residual variance of dedication was fixed to 1 for acceptable model fit. Control variables (teacher gender, work experience, and class size) were first tested in the models at the same time, resulting in over-identification of the model due to the sample size (n = 49) and model complexity. Then, the control variables were added one at a time to the six models to test for their relation to the interaction quality variables (emotional support, classroom organization, and instructional support). Since there was a notable association only between teacher gender and emotional support, or instructional support, this control variable was kept for all the six models whereas work experience and class size were left out. In the models, the two independent variables in the SEM models, that is, teacher gender with work engagement or burnout, were not allowed to correlate.

Due to high correlations between the interaction domains (emotional support, classroom organization, and instructional support) and based on previous literature, they were analyzed in separate models. For example, emotional support and classroom organization had a high correlation of 0.72 in the current sample. Previous studies which tested teacher-student interactions using TTI framework (e.g., Pöysä et al., 2019; Virtanen et al., 2018) also found high correlations between the CLASS domains and suggested that the multicollinearity may cause problems in statistical modelling. Thus, modelling each CLASS domain separately was chosen in the present study. Furthermore, following previous studies (Penttinen et al., 2020) and correlations between the two constructs, work engagement and burnout were analyzed in separate models to receive a more fine-grained picture of how both positive and negative aspects of teacher occupational well-being are linked to quality of teacher-student interactions.

To address the skewed nature of some of the variables (cynicism, inadequacy, vigor, dedication, and absorption), maximum likelihood with robust standard errors (MLR) estimation was employed. Further, to address the small sample size and the non-parametric nature of the confidence intervals of the variables, bootstrapping with maximum likelihood (ML) was also used to test the models. The standardized model results of MLR models were examined. The 95% confidence intervals (Cis) and estimators (unstandardized, for asymmetrical CI results) of the bootstrapped ML models were also checked, and they showed the same direction of relations of the variables with the MLR model results (Appendix Table A). In this article, results of the MLR models are reported. Fit indices which fell into the following range were considered indications of acceptable model fit: chi-square, $p > 0.5$; baseline model chi-square, $p < 0.001$; comparative fit index (CFI), .95–1.00 (Hu & Bentler, 1999); Tucker–Lewis index (TLI), .95–1.00 (Hu & Bentler, 1999); estimate of root mean square error of approximation (RMSEA), 0–0.06 (Hu & Bentler, 1999); and standardized root mean square residual (SRMR), 0–0.05 (Byrne,

2013). The fit indices results for the acceptable models are shown at the captions of the figures.

Monte Carlo simulations were conducted as post hoc power analyses to evaluate the statistical power of tested models across different sample sizes (N = 35, 49, 100, 150, 200, and 300). These simulations aimed to determine the sample size required to achieve sufficient power (> 0.80) for detecting the hypothesized effects in the structural equation models. For instance, the results indicated that in simulations with N = 49, the 95% confidence interval for the relationship between work engagement and emotional support frequently contained the true parameter value. Although sample size of 49 was adequate, a bigger sample size, e.g., N = 200, may be needed to increase the power in how likely the model can detect a true effect.

Results

Descriptive statistics and correlations

Table 1 displays the descriptive statistics and correlations between the study variables. Classroom organization displayed a relatively high level (M = 5.61), while the other two domains, emotional support, and instructional support, had a mean of 5.15 (relatively high) and 2.39 (relatively low), respectively.

TABLE 1 Descriptive statistics and correlations for study variables

	Descriptives					Correlations											
	n (%)	Min.	Max.	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
Background																	
1. Gender						–											
Female			46 (94%)														
Male			3 (6%)														
2. Work experience [a]	48	0.00	40.00	18.51	10.30	0.15	–										
3. Class size	49	5.00	26.00	18.84	4.64	0.12	0.07	–									
Occupational well-being																	
Work engagement	49	3.44	7.00	6.18	0.85												
4. Vigor	49	4.00	7.00	6.13	0.84	– 0.06	– 0.03	– 0.09	–								
5. Dedication	48	3.67	7.00	6.30	0.81	– 0.01	– 0.10	– 0.17	0.71***	–							
6. Absorption	49	1.00	7.00	6.12	1.21	0.10	– 0.14	0.01	0.58***	0.82***	–						
Burnout	49	1.00	4.67	2.55	0.96												
7. Emotional exhaustion	49	1.00	5.67	3.20	1.16	0.14	0.15	0.02	– 0.13	– 0.14	– 0.01	–					
8. Cynicism	49	1.00	5.67	2.10	1.12	0.07	0.21	0.18	– 0.59***	– 0.63***	– 0.49***	0.36*	–				
9. Inadequacy	49	1.00	5.33	2.35	1.18	0.03	0.26	0.10	– 0.48**	– 0.62**	– 0.47**	0.39**	0.84***	–			
Teacher–student interactions																	
10. Emotional support	49	4.33	5.95	5.16	0.36	– 0.21	– 0.07	– 0.05	0.29*	0.33*	0.20	0.02	– 0.17	– 0.12	–		
11. Classroom organization	49	4.61	6.40	5.62	0.39	– 0.08	0.20	0.04	0.14	0.19	0.06	0.16	0.08	0.11	0.72***	–	
12. Instructional support	49	1.78	3.27	2.40	0.31	– 0.21	– 0.12	– 0.23	0.15	0.28†	0.17	– 0.01	– 0.24	– 0.20	0.53***	0.49***	–

Note. [a] Work experience at school, recorded in years with 1 decimal place. *p*-values (2-tailed), †$p < .07$; *$p < .05$; **$p < .01$; ***$p < .001$.

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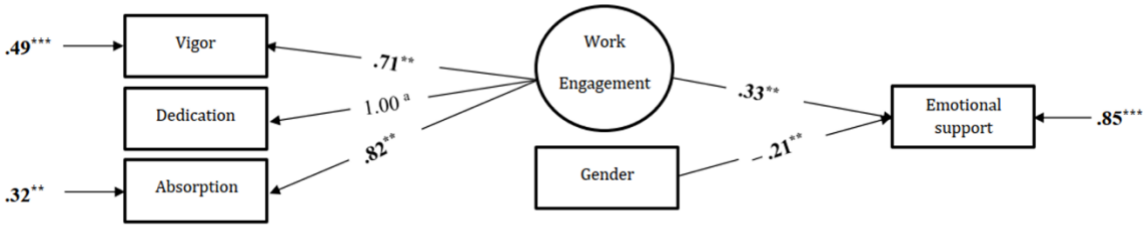
Structural equation modelling

The first aim of this study was to investigate to what degree teacher work engagement (i.e., vigor, dedication, absorption) is related to the quality of teacher–student interactions. Work engagement, which represented the positive aspect of occupational well-being in the present study, was tested as a latent variable with emotional support, classroom organization, and instructional support in three models separately. First, work engagement had a positive relation to emotional support, indicating that the higher work engagement levels the teachers reported, the higher quality of emotional support was observed in the classrooms (see Fig 1). Second, considering classroom organization, the results showed no significant relation between work engagement and classroom organization, suggesting that the levels of work engagement teachers reported did not have a significant relation to the quality of the classroom organization. Third, work engagement had a positive relation to instructional support, indicating that the greater work engagement that the teachers reported, the higher-quality instructional support observed in the classrooms (see Fig 2).



Note. [a] Residual variance of dedication fixed to 0. $N = 49$. Standardized estimates. Significant associations in bold. Work engagement is a higher-order latent factor composed of vigor, dedication and absorption. *p*-values (2-tailed), $^{\dagger}p < .07$; $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$. Fit: chi-square, $p > 0.5$; RMSEA = .00; CFI = 1.00; TLI = 1.00; baseline model chi-square, $p < 0.001$; SRMR = .04.

FIGURE 1 Structural equation model of work engagement and emotional support

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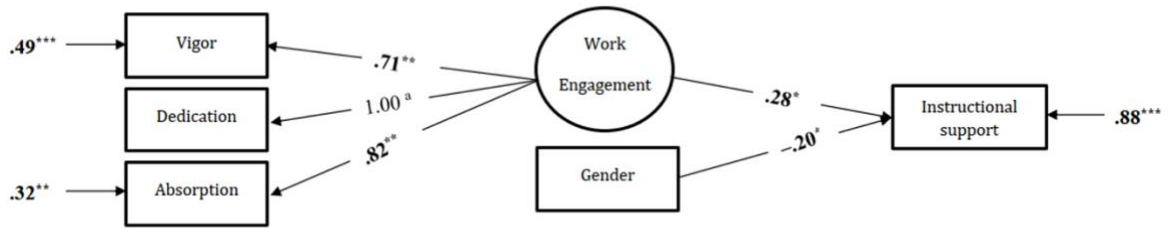
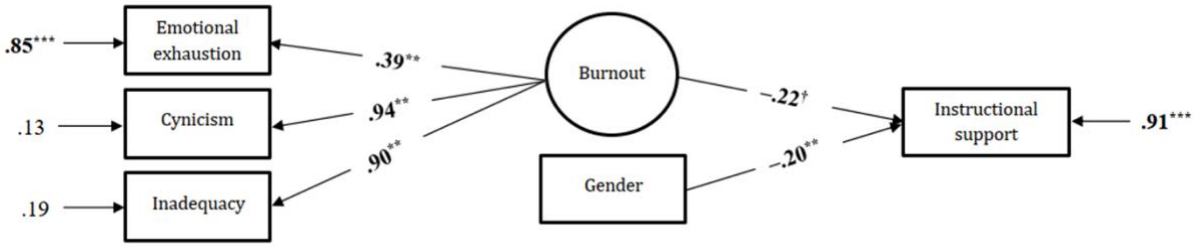


Note. [a] Residual variance of dedication fixed to 0. $N = 49$. Standardized estimates. Significant associations in bold. Work engagement is a higher-order latent factor composed of vigor, dedication and absorption. p-values (2-tailed), †$p < .07$; *$p < .05$; **$p < .01$; ***$p < .001$. Fit: chi-square, $p > 0.5$; RMSEA = .00; CFI = 1.00; TLI = 1.00; baseline model chi-square, $p < 0.001$; SRMR = 0.03.

FIGURE 2 Structural equation model of work engagement and instructional support

The second aim of this study was to investigate to what degree teacher's experience of burnout (i.e., emotional exhaustion, cynicism, inadequacy) is related to the quality of teacher–student interactions. Burnout, which represented the negative aspect of occupational well-being in the present study, was tested as a latent variable with emotional support, classroom organization, and instructional support in three models separately. First, the results showed that burnout had no significant relation to emotional support observed in the classrooms. Second, similarly, the results showed that burnout had no significant association with classroom organization that was observed in the study. Third, burnout had a marginally significant negative relation to instructional support, suggesting that the higher level of burnout that the teachers reported, potentially the lower-quality instructional support observed in the classrooms (see Fig 3). As the models were saturated, the fit indices indicated a perfect fit to the data, with CFI = 1.00, TLI = 1.00, and RMSEA = .00.



Note. $N = 49$. Standardized estimates. Significant associations in bold. Burnout is a higher-order latent factor composed of emotional exhaustion, cynicism and inadequacy. p-values (2-tailed), †$p < .07$; *$p < .05$; **$p < .01$; ***$p < .001$. Fit: chi-square, $p > 0.5$; RMSEA = .00; CFI = 1.00; TLI = 1.00; baseline model chi-square, $p < 0.001$; SRMR = 0.04.

FIGURE 3 Structural equation model of burnout and instructional support

Discussion

The aim of this study was to enhance the knowledge of the relations between positive and negative aspects of teachers' occupational well-being and quality of teacher–student interactions in primary school classrooms. This study is among the first to investigate work engagement and burnout in relation to observed quality of teacher–student interactions. The findings revealed that grade 2 teachers who reported higher levels of engagement were observed exhibiting a higher level of emotional support and higher level of instructional support. Moreover, teachers who reported higher levels of burnout were observed exhibiting a marginally significant lower level of instructional support in classrooms.

Interpretations of findings

First, as hypothesized in Hypothesis 1a, results showed that the quality of emotional support was positively associated with teachers' work engagement. In accordance with the prosocial classroom model (Jennings & Greenberg, 2009) which asserts the cruciality of teachers' well-being as well as social and emotional competence in developing and sustaining supportive teacher–student interactions, it is possible that primary school teachers with a high level of work engagement would be more attuned to the classroom climate, students' academic and emotional needs, and students' perspectives, resulting in higher-quality emotional support. This result is also in line with the Job Demands-Resources model as it showed that in the motivation process, when individuals are engaged in their work, their job performance, in this case their interactions with students in the classrooms, could be more motivated and positively influenced (Schaufeli & Bakker, 2004).

Second, regarding the relation between teachers' work engagement and the quality of classroom organization, the current findings did not substantiate Hypothesis 1b and previous studies (Soininen et al., 2023) which found that work engagement was associated with higher-quality teacher–child interactions in grade 1 classrooms. The present study found instead that there was no significant connection between the grade 2 teacher work engagement and observed quality of classroom organization. It could be conjectured that primary school teachers' ability to provide high-quality behavior management, manage class productivity, and maximize student engagement may not necessarily be that much connected to their levels of work engagement, at least in grade 2 classrooms. One explanation for this result could be the overall high-quality classroom organization of teachers. To further investigate this result, the potential mechanisms between teacher work engagement and their quality of classroom organization could also be further examined by looking into different types of classroom activities in more detail.

Third, regarding the relations between teachers' work engagement and the quality of instructional support, as hypothesized in Hypothesis 1c and in line with Penttinen and colleagues' (2020) findings, the current results revealed that the observed quality of instructional support was positively associated with the grade 2 teacher work engagement. It is possible that, similarly to what happened in the kindergarten classrooms, engaged primary school teachers could be more aware of their use of scaffolding, feedback, instructional discussions, and activities to promote students' cognitive and language development, which is then reflected in higher-quality instructional support.

Fourth, regarding the relations between teacher burnout and quality of emotional support, contrary to Hypothesis 2a and previous studies performed in grade 6–8 classrooms and preschool classrooms (Braun et al., 2018; Jennings, 2015), the current results showed that the quality of emotional support was not statistically significantly associated with teacher burnout. This needs further investigation but may suggest that when primary school teachers experience burnout symptoms, it does not necessarily affect their attention to the classroom climate, students' academic and emotional needs, and students' perspectives. One possible explanation for the findings could relate to how burnout symptoms may be reflected on teacher performance differently than work engagement. Work engagement encompasses feelings of vigor, dedication, and absorption, which are likely to foster warm and supportive interactions with students, as engaged teachers may be more actively attuned to the needs of others. In contrast, burnout is characterized by emotional exhaustion, cynicism, and feelings of professional inadequacy, which may manifest in teacher-student interactions somewhat differently. Findings indicate that, despite their own challenges of occupational well-being, teachers may still prioritize supportive classroom interactions and responding to their students' needs. However, further investigation is needed to fully understand this dynamic and draw further inferences. Another possible explanation involves the nature of emotional support itself. Emotional support is not only about teachers' nonverbal and verbal actions and behavior, but it also encompasses the overall positive atmosphere and respectful interactions between teachers and students, as well as among the students.

Fifth, regarding the relations between teachers' burnout and the quality of classroom organization, the findings did not substantiate Hypothesis 2b or align with previous studies conducted in grade 6 classrooms (Virtanen et al., 2018), as well as in classrooms from kindergarten to grade 2 (Braun et al., 2018; Hoglund et al., 2015), which typically indicate a negative relationship between these variables. Instead, we observed no significant association between teachers' burnout and the observed quality of classroom organization. One possible explanation could be that effective classroom organization involves setting of the class rules and habits which are built over time rather than having a direct reflection of teacher's emotional state. Another possible explanation is that the

teachers in this study may already have a strong foundation of behavioral and time management skills that enable them to maintain effective classroom organization with their students even when experiencing challenges with their occupational wellbeing. This could be because, similarly to pre-primary education, in primary education classroom organization is also highly regarded and embedded in Finnish pre-service teacher training and teachers in Finland generally have good skills in this area, which may then contribute to the stability of their classroom management skills. The effective behavior and time management skills have become their toolkit which they can use even when having some struggles with their own occupational well-being.

Finally, regarding the relations between teachers' perceived burnout and the quality of instructional support, as hypothesized in Hypothesis 2c and in line with Jennings's (2015) findings, instructional support was negatively associated with teachers' burnout, albeit marginally significantly. It is possible that similarly to what happens in preschool level classrooms, when primary school teachers experience burnout, their ability to be aware of their use of instructional discussions and activities to promote students' cognitive and language development may be lowered, which is then reflected in a lower level of instructional support.

Implications and future research directions

Overall, the positive and negative aspects of well-being experienced by primary school teachers in their occupation were found to be connected to the observed quality of classroom interactions in different ways. Evidently, the work engagement of teachers may play a significant role in the implementation of effective emotional atmosphere and instructional practices in classrooms. Conversely, teachers' burnout symptoms may play a more significant role in implementation of high-quality instructional practices. These intriguing findings prompt the need for an inquiry into the underlying mechanisms governing the connections between teachers' work engagement or burnout and various facets of the teaching job performance, that is, their emotional and instructional practices. The current findings suggest that prioritizing to support primary school teachers' work engagement and preventing higher levels of burnout during this phase enables them to sustain positive and affectionate classroom climate and deliver cognitively and linguistically stimulating instruction (e.g. emotional support and instructional support).

Specifically, there are some further implications that can be derived from the phenomenon observed in this study. First, the present investigation exhibited the conceivable role that primary school teachers' work engagement plays in terms of teachers' emotional practices in the classroom, and it revealed an urgent need for further research on the connections between the two. It is possible that teachers who are more engaged tend to provide a higher level of emotional support in the classroom (Jennings &

Greenberg, 2009), and at the same time, it is also possible that a classroom environment with a high level of emotional support (e.g., positive climate) further motivates teachers' work engagement (Bakker & Demerouti, 2008).

Second, it is important to give due attention to instructional practices concerning their connection with both the positive and negative aspects of teacher occupational well-being. In this study, viewed through the lens of the Job Demands-Resources model (Schaufeli & Bakker, 2004), the interaction quality was posited as the job performance which was influenced by teacher occupational well-being as described in the later part of the model. However, considering the demands and resources balance perspective described at the beginning part of the model, it would be worthwhile to determine if high-quality instructional support would also serve as a resource for teachers. The intricate mechanisms through which it operates as a cycle would be of particular interest.

Third, we should be aware that our findings indicate two potential occurrences in the classroom. On one hand, there is a possibility that teachers who exhibit high levels of work engagement or low levels of burnout contribute to higher-quality instructional support. However, on the other hand, it is also plausible that a decline in instructional support quality, such as the absence of a successful feedback loop between teachers and students, can negatively impact teacher engagement and potentially lead to increased stress and the onset of burnout symptoms. The nature of the relations would need further investigation.

Furthermore, it is important to note that while teacher occupational well-being may significantly reflect on supportive teacher–student interactions in the emotional and instructional sense, our results in terms of classroom organization did not necessarily align with Jennings and Greenberg's (2009) prosocial classroom model. It is worth further investigating the possible mechanism behind this lack of association. For example, the influence of teachers' occupational well-being on teachers' classroom organization, as a specific aspect of job performance, could vary and require further exploration. Further, the lack of a significant link between these two factors may in some way be connected to the high quality of teacher education which was evidenced by the relatively high-level quality of classroom organization observed in the current study.

Moreover, future research could also examine in more detail the two pathways of the engagement and burnout in the JD-R model, to gain a deeper understanding of how work engagement and burnout potentially influence each other, impact the overall well-being, and how they all together link with teacher-student interactions. For example, with a bigger sample size, a model including all indicators of work engagement, all indicators of burnout, several teacher and classroom characteristics, and three domains of teacher-student interactions could potentially be examined.

Finally, although the results concerning classroom organization were not the same as in the previous studies, it is worth thinking forward as to what kind of data would be beneficial to understand the relationship more fully between teacher occupational well-being and interactions in the classroom, and if such information could reveal the reason for these different results. In the present study, as the data consisted entirely of quantitative measures, we suggested that further examination should be conducted in the classroom using a combination of both quantitative and qualitative data. Also, it would be beneficial if the perspectives of students on teachers' occupational well-being and quality of classroom interactions could also be investigated at the same time (Klusmann et al., 2022). Furthermore, it would be valuable to conduct a more in-depth investigation into the interplay between work-related engagement and burnout, and how this interrelationship influences the quality of classroom interactions. Given the complexity of the classroom context and the variety of possible interactions between teachers and students, the approaches suggested above may provide a better comprehension of the underlying mechanisms of the connections between teachers' occupational well-being and interactions in the classroom.

Limitations and future directions

This study has some limitations that warrant mention. First, due to the small sample size, generalization of the conclusions drawn should be precluded. Although the sample size of the current study is comparable with those of previous studies which investigated occupational well-being and teacher-student interactions (e.g., Penttinen et al., 2020) and the post hoc power analysis suggested it being adequate, the power analyses also suggested that the results obtained could be more reliably achieved with larger sample size. Thus, the proposed relations should be further investigated with larger sample size and data set. Second, the gender ratio of the sample was 3:46 for male to female. However, it should be noted the limited gender diversity in the sample reflects the actual Finnish primary school context in which 77% of the teachers are female (Finnish National Agency for Education [EDUFI], 2018). Third, since this study is cross-sectional, the results should not be used to conclude the directionality of effect. Longitudinal studies would be of value to further investigate the directions of the relations.

Further, although the present study included some control variables (teacher gender, work experience, and class size), future studies could also include other potential confounding factors. Given the potential impact of various teacher characteristics on classroom dynamics, it is recommended to further consider and incorporate additional elements, such as teacher personality traits, to achieve a more comprehensive understanding of teacher-student interactions (Angelini, 2023; Smidt et al., 2018).

Finally, the data for this study were collected before the COVID-19 pandemic. For future studies, the influences in terms of occupational well-being experienced by teachers should be considered when conducting research in the post-COVID environment. Examining how these experiences have impacted the levels of different types of demands and resources for teachers in the post-COVID period is essential when further investigating teachers' occupational well-being and teacher work performance, including interaction quality.

Conclusions

The present study revealed a positive relation between work engagement and the observed quality of emotional and instructional supports among primary school teachers. In addition, teachers' burnout symptoms demonstrated a potential negative association with the observed instructional support quality in classrooms. By highlighting the significance of positive relations between teachers' occupational well-being and the quality of interactions with students, this study underlines the need for more targeted interventions to promote the positive aspects of occupational well-being and for placing an increased emphasis on occupational well-being in pre-service and in-service teacher trainings programs.

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Appendix

TABLE A Result of SEM with ML estimator and bootstrapping for robustness checks

Model		*B*	95% Confidence interval	
			Lower	Upper
1 [a]	Emotional Support Regressed on Engagement	0.197	0.067	0.371
	Emotional Support Regressed on Gender	-0.309	-0.413	-0.214
2	Emotional Support Regressed on Burnout	-0.103	-0.477	0.049
	Emotional Support Regressed on Gender	-0.305	-0.476	-0.163
3	Classroom Organization Regressed on Engagement	0.127	0.000	0.316
	Classroom Organization Regressed on Gender	-0.132	-0.485	0.161
4	Classroom Organization Regressed on Burnout	0.096	-0.118	0.359
	Classroom Organization Regressed on Gender	-0.144	-0.409	0.095
5 [a]	Instructional Support Regressed on Engagement	0.143	0.024	0.303
	Instructional Support Regressed on Gender	-0.258	-0.374	-0.140
6 [a]	Instructional Support Regressed on Burnout	-0.143	-0.432	-0.013
	Instructional Support Regressed on Gender	-0.248	-0.338	-0.166

Note. SEM with bootstrap at level 1000 and ML estimator. [a] The confidence intervals of the model results for models 1, 5, and 6 were examined to verify the direction of the estimates by comparing to the MLR models which showed significant relationships. Model 1 = Emotional Support Regressed on latent variable Engagement and Gender; Model 2 = Emotional Support Regressed on latent variable Burnout and Gender; Model 3 = Classroom Organization Regressed on latent variable Engagement and Gender; Model 4 = Classroom Organization Regressed on latent variable Burnout and Gender; Model 5 = Instructional Support Regressed on latent variable Engagement and Gender; Model 6 = Instructional Support Regressed on latent variable Burnout and Gender. The remaining paths, such as the factor loadings of the latent engagement or burnout variables, intercepts, variances, and residual variances of all models, show satisfactory 95% confidence intervals, with a few exceptions. These include the residual variance of cynicism and inadequacy in Model 2, Model 4, and Model 6. Model fit information (MLR), Model 1: Chi-square p>0.05, significant; CFI >0.95; TLI>0.95; Baseline model Chi-square p<0.05; SRMR = 0.035 (i.e. <0.08); Model 2: Chi-square p>0.05, significant; CFI >0.95; TLI>0.95; Baseline model Chi-square p<0.05; SRMR = 0.036 (i.e. <0.08); Model 3: Chi-square p>0.05, significant; CFI >0.95; TLI>0.95; Baseline model Chi-square p<0.05; SRMR = 0.035 (i.e. <0.08); Model 4: Chi-square p>0.05, significant; CFI >0.95; TLI>0.95; Baseline model Chi-square p<0.05; SRMR = 0.047 (i.e. <0.08); Model 5: Chi-square p>0.05, significant; CFI >0.95; TLI>0.95; Baseline model Chi-square p<0.05; SRMR = 0.032 (i.e. <0.08); Model 6: Chi-square p>0.05, significant; CFI >0.95; TLI>0.95; Baseline model Chi-square p<0.05; SRMR = 0.045 (i.e. <0.08).