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# The impact of perceived student engagement on teacher burnout: The mediating role of anger and the moderating role of the teacher-student relationship

## *Impacto del compromiso escolar percibido en el* burnout *docente: el rol mediador del enfado y el papel moderador de la relación docente-estudiante*

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**Abstract:**

Teacher burnout is a critical issue in the field of education and is a psychological occupational hazard with negative impacts on both teacher well-being and students' academic outcomes. Based on the job demands-resources model, it is proposed that teacher burnout can be predicted by perceptions of job demands and resources. This study aimed to analyse how teachers' perceptions of student engagement (resource) affect their burnout, considering the mediating role of anger (demand) and the moderating role of the teacher-student relationship (resource) in this association. An explanatory cross-sectional correlational design was used, involving 338 Chilean teachers (76% women) aged from 23 to 73 years ($M$ = 41; $SD$ = 10.29). Measures of student engagement (perceived by teachers), teacher emotions, teacher-student relationship, and burnout were used. To test the proposed relationships, a moderated mediation analysis was performed using Hayes model 14 PROCESS macro. The results showed a moderated mediation effect of anger and the teacher-student relationship on the association between teacher-perceived student engagement and burnout. Specifically, the quality of the teacher-student relationship moderates the negative mediating impact of anger on the relationship between perceived student engagement and teacher burnout. These findings highlight the importance of promoting student engagement and positive teacher-student relationships as job resources to mitigate teacher burnout, thereby improving the educational climate and teacher well-being.

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**Keywords:** student engagement, teacher burnout, teacher anger, teacher emotions, teacher-student relationships, teacher well-being.

**Resumen:**

El *burnout* docente es un problema crítico en el ámbito educativo y un riesgo laboral psicológico, con impactos negativos tanto en el bienestar del profesorado como en los resultados académicos del estudiantado. Desde el modelo de demandas y recursos laborales, se propone que el *burnout* docente es predicho por las percepciones de demandas y recursos laborales. Por ello, el presente estudio tuvo como objetivo analizar cómo el compromiso escolar percibido por los docentes (recurso) impacta en su *burnout*. En esta asociación, se consideró el rol mediador del enfado (demanda) y el rol moderador de la relación docente-estudiante (recurso). Se empleó un diseño transversal correlacional de tipo explicativo; participaron 338 docentes de Chile (76 % mujeres) de entre 23 y 73 años ($M$ = 41; $DE$ = 10.29). Se utilizaron medidas de compromiso escolar (percibido por el docente), emociones docentes, relación docente-estudiante y *burnout*. Para testear las relaciones propuestas, se realizó un análisis de mediación moderada a través de la macro PROCESS (modelo 14) de Hayes. Los resultados obtenidos muestran una mediación moderada del enfado y de la relación docente-estudiante en la asociación entre compromiso escolar percibido por el docente y el *burnout*. Es decir, la calidad de la relación docente-estudiante modera el impacto mediador negativo que tiene el enfado en la relación entre el compromiso escolar percibido y el *burnout* docente. Los hallazgos subrayan la importancia de promover el compromiso estudiantil y las relaciones docente-estudiante positivas en tanto que recursos laborales para mitigar el *burnout* docente. Así, mejoraría el clima educativo y el bienestar de los y las docentes.

**Palabras clave:** compromiso escolar, burnout docente, enfado docente, enojo docente, emociones docentes, relación docente-estudiante, bienestar docente.

## 1. Introduction

Despite growing interest in teacher well-being, research into the effect of teachers' perceptions of student engagement on their experience of burnout remains limited (for an exception, see Covell et al., 2009). Moreover, underlying mechanisms that might explain this relationship, such as the role of the emotions that teachers experience in the classroom, have not been explored. From the perspective of attribution theory (Weiner, 1985), teachers' interpretations of the causes of their students' behaviour, for example, their level of engagement, can significantly affect their own emotions, attitudes, and behavioural responses, such as pedagogical practices (Chang, 2009). So, when teachers interpret low engagement by a student as the result of lack of interest in the subject, it is probable that they will experience negative emotions such as frustration or anger. In contrast, if they attribute it to external circumstances, such as family difficulties, they might display a more understanding and supportive attitude. The present study seeks to analyse how the student engagement perceived by teachers, classed as a resource in the demands-resources explanatory model of Demerouti et al. (2001), affects their burnout, considering the mediating role of anger (demand) and the moderating role of the teacher-student relationship (resource) in this association.

### 1.1. Teacher burnout

Freudenberger (1974) coined the term burnout to describe gradual emotional depletion and loss of motivation, defining it as a state of mental and physical exhaustion relating to professional life. According to Freudenberger, this phenomenon occurs because of accumulated fatigue from the demands of work and because of reduced motivation, especially when the efforts invested in one's work do not produce the expected results. Maslach and

Jackson (1981) subsequently conceptualised burnout as a psychological syndrome that arises as a prolonged response to chronic interpersonal stressors in work, and which comprises three principal dimensions: emotional exhaustion; depersonalisation; and reduced personal accomplishment or inefficacy (Maslach et al., 2001; Maslach & Leiter, 2016; 2017). Emotional tiredness refers to the perception of emotional exhaustion derived from constant contact with other people. Depersonalisation entails negative attitudes or an excessive disconnection from the people who receive services or care from the worker. Finally, inefficacy relates to a reduction in the perception of competence and success in job performance.

In the educational setting, understanding of the burnout experienced by teachers has aroused notable interest, with evidence that it has harmful consequences for teacher well-being, especially for their self-perceived health, mental health, and job satisfaction (Klassen et al., 2010; Robinson, et al., 2019; Saloviita & Pakarinen, 2021; Schonfeld & Bianchi, 2016) and also for students' performance and adaptation (Herman et al., 2018; Saloviita & Pakarinen, 2021). Similarly, teacher burnout has been linked to elevated levels of absence, retirement, and turnover, as well as a fall in the quality of job performance (Ingersoll & May, 2012; Klusmann, et al., 2008).

The present study uses as its conceptual framework the job demands-resources (JD-R) model (Demerouti et al., 2001), which proposes that teacher stress and burnout are predicted by their perceptions of job demands and resources (Hakanen et al., 2006; Lorente et al., 2008). The central assumption of this model is that work-related stress appears when a person's resources have been exceeded, producing an imbalance between demands and resources that can have a negative impact on teachers' well-being indicators and cause high levels of burnout (Bakker & Demerouti, 2007; Bakker et al., 2014; Wischlitzki et al., 2020). Job demands include aspects such as work overload; conflicting roles; the school environment; conflicts with colleagues; and problems with student behaviour (Hakanen et al., 2006; Pyhalto et al., 2011; Skaalvik & Skaalvik, 2010; Wischlitzki, et al., 2020). The following job resources are distinguished: teacher efficacy; support from colleagues and management; participation in decision making; public recognition; and professional development (Rudow, 1999; Wischlitzki et al., 2020).

Given that teacher burnout has harmful effects at individual, student, organisational and social levels, the factors or variables associated with teacher burnout require more attention from research. From this perspective, it is of interest to study the impact of teachers' perceived student engagement (resource), the teacher-student relationship (resource), and anger or annoyance as the teachers' emotion (demand), on the levels of burnout that teachers experience.

## 1.2. Student engagement and its impact on teachers

Student engagement refers to students' level of involvement and the sense of belonging that in their educational institution that they experience, as well as their motivation to achieve academically (Fredricks et al., 2004). This construct has proven to be a significant predictor of academic performance (Dogan, 2015) and is inversely associated with problematic behaviours, such as early school leaving and disruptive behaviour (Delfino, 2019; Finn & Zimmer, 2012; Wang & Fredricks, 2014). The multidimensional conceptualisation of student engagement has four dimensions: cognitive, behavioural, emotional, and social (Wang et al., 2019). Each of these dimensions can be influenced by contextual factors, including support from key figures such as parents, peers and, in particular, support from teachers (Ansong et al., 2017; You & Sharkey, 2009).

Teachers play a crucial role in promoting student engagement. Different studies have shown that a teacher-student relationship characterised by warmth, emotional support, and closeness favours greater engagement among students (Pérez-Salas et al., 2021; Quin, 2017; Roorda et al., 2011). However, the impact of student engagement is not unilateral; instead it can significantly influence the teachers. A greater perception of student engagement by teachers positively impacts their enjoyment of teaching, their teacher self-efficacy (Martin, 2007),

their job satisfaction (Burić et al., 2024; Kengatharan, 2020), and their instructional behaviour of support for students (André et al., 2023), all of which can in turn positively affect students' academic results (André et al., 2023; Brandmiller et al., 2024). In contrast, when teachers perceive low student engagement, they can experience more negative emotions such as frustration or anger (Frenzel et al., 2018; Yu et al., 2021) or emotional exhaustion (Burić et al., 2024), and this can ultimately contribute to teacher burnout (Chang, 2013; Covell et al., 2009; Wang & Burić, 2023).

To date, few studies have examined how student engagement perceived by teachers impacts their burnout levels (e.g., Covell et al., 2009) and no studies have considered what mechanisms could mediate this relationship, such as the emotions teachers experience. In line with attribution theory (Weiner, 1985), teachers' perceptions of the causes of student behaviour (such as engagement) could affect their own emotions, attitudes, and behavioural reactions (Chang, 2009). For example, if a teacher attributes the low engagement of a student to a lack of interest in the content of the subject, the teacher could react with loss of motivation or with anger, while attribution to external factors, such as family problems, could evoke a more empathetic and supportive response.

### 1.3. Teachers' emotions: teacher anger

In the educational context, the work of teachers is intrinsically emotional owing to interpersonal demands, conflict management, and the need to be deeply involved in the learning and well-being of students (Chang, 2009; Wang et al., 2023). Accordingly, the relevance of emotions lies both in their impact on teachers' well-being and in their capacity to influence the emotional atmosphere of the classroom, in turn affecting the emotions and performance of the students (Frenzel et al., 2018)

Emotions are multidimensional states comprising motivational, physiological, and affective elements (Pekrun, 2006). Anger, in particular, is one of the most common negative emotions in the field of teaching (Frenzel et al., 2016; McPherson et al., 2003; Prosen & Smrtnik-Vitulić, 2019) and it has significant implications for well-being (Çankaya, 2011), professional self-efficacy (Burić et al., 2020), and the risk of burnout in teachers (Chang, 2009). The literature has observed that anger in the educational context frequently arises from the perception of a lack of respect and interpersonal conflicts (McPherson et al., 2003), poor discipline (Hagenauer et al., 2015), and low engagement by students (Chang, 2013; Hagenauer et al., 2015)

Nonetheless, the role of teachers' emotions has been little explored. This is because the majority of studies on emotions in the educational sphere have centred on students' emotions rather than teachers' emotions, especially in variables such as anxiety about exams (Pekrun et al., 2002). The little literature that does exist with regards to teachers' emotions finds that negative emotions, such as anxiety, are related to increased plans to leave the teaching profession (Wang & Hall, 2021) and that negative emotions mediate the relationship between burnout and well-being (Varela et al., 2023). A low level of anger is associated with greater self-efficacy and enthusiasm for one's work (Romo-Escudero et al., 2024); in contrast, a high level of anger is associated with more aggression (Çankaya, 2011).

Given the high prevalence of burnout among teachers (García-Carmona et al., 2019) and the growing rates of teachers leaving the profession (Gonzalez-Escobar et al., 2020), is essential to research how negative emotions like anger contribute to this phenomenon and explore what variables could moderate this relationship, such as, for example, the teacher-student relationship.

### 1.4. Teacher-student relationship

The teacher-student relationship is a bond built through affective and academic interactions in the classroom, and it has been identified as a key factor in predicting student engagement and student well-being (Roorda et al., 2011). The teacher-student relationship is bidirectional, that is to say, the two parties mutually influence one another's perceptions and emotions. According to Sabol and Pianta (2012), the teacher-student relationship has frequently

been understood as a variable with three dimensions: proximity, conflict, and dependency. Proximity refers to the positive emotional connection and mutual support that generate an environment of trust and security, favouring the student's learning and emotional regulation. Conflict implies tensions or difficulties in the interaction, which can degrade the classroom environment and affect both teacher well-being and student behaviour. Finally, dependency refers to an excessive student need for constant attention or validation from the teacher, which can limit the development of the student's autonomy and generate an emotional burden for the teacher (Sabol & Pianta, 2012).

From the teacher's perspective, the quality of the relationship with students also plays a crucial role in their professional well-being (Dreer, 2023; Spilt et al., 2011). Studies have shown that a positive relationship with students is associated with greater enjoyment, less emotional exhaustion (Taxer et al., 2019), and greater job satisfaction (Lavy & Bocker, 2018). In contrast, conflictive or distant relations can increase emotional exhaustion, as teachers face greater emotional challenges and difficulties in classroom management, which can increase the risk of burnout (Rodríguez-Mantilla & Fernández-Díaz, 2017).

## 2. Method

The aim of the present study is to analyse how student engagement, as perceived by teachers, affects their burnout, considering the mediating role of anger and the moderating role of the teacher-student relationship on this association. To do so, two hypotheses are proposed. Firstly, it is proposed that anger, as a job demand that requires regulatory effort, could function as a mediator in the relationship between perceived student engagement (resource) and teacher burnout, suggesting that the levels of engagement that teachers observe in their students could influence their emotion of anger, which, in turn, would contribute to teacher burnout. Secondly, a moderating role of the teacher-student relationship is hypothesised, classifying it as a job resource, which suggests that a quality relationship could mitigate the impact of anger on teacher burnout. Understanding the interactions between these variables is key for designing interventions that promote an emotionally healthy teaching environment, thereby reducing burnout and improving teacher well-being and job satisfaction, thus contributing to teacher retention and effectiveness and ultimately to students' academic performance.

### 2.1. Design

An explanatory cross-sectional correlational design was used (Johnson, 2001) to test the proposed relationships.

### 2.2. Participants

Convenience sampling was used to collect data from 338 teachers in Chile (76% women), aged between 23 and 73 years ($M$ = 41; $SD$ = 10.29). The inclusion criteria were being a teacher or a special educational needs teacher by profession (similar to the figure of the therapeutic pedagogy teacher in Spain) and delivering classes in mainstream schools with or without a school integration project (PIE). A school integration project (*proyecto de integración escolar*, PIE) is a Chilean policy initiative that promotes the inclusion of students with special educational needs in mainstream education through specialised support.

Teaching in special education schools was used as an exclusion criterion to ensure greater homogeneity in the conditions of the educational environment. This decision sought to control potential exogenous variables associated with the particular characteristics of special schools (such as internal organisation, specific resources, and student profile) that might have affected the data.

The sample size was estimated following the guidelines of Fritz and MacKinnon (2007), which indicate that at least 148 participants are required to detect medium-sized mediation

effects in both paths ($\alpha = 0.26, \beta = 0.26$) with a power of 80% and with a bootstrapping method. In this study, the sample of 338 teachers amply exceeds this threshold, guaranteeing sufficient power for medium-sized effects. This ensures the statistical validity of the results obtained.

## 2.3. Tools

Teacher burnout is defined as the syndrome of professional depletion characterised by physical, emotional, and mental depletion resulting from prolonged exposure to stressor factors in the educational context. The version of the Maslach Burnout Inventory-General Survey (MBI-GS) by Maslach and Jackson (1986) adapted and validated for Chile was used to evaluate this. This version consists of 15 items assessed on a 7-point Likert scale and grouped in 3 subscales: emotional exhaustion ("I feel emotionally worn out by my work"), depersonalisation ("I have been losing enthusiasm by my work"), and personal accomplishment ("I feel that I have achieved many valuable things at work"). The validation of this adaptation was done with two samples of workers from the education ($n$ = 206) and health ($n$ = 214) sectors, with both samples displaying adequate construct validity, internal consistency, and metric invariance indices (Rodríguez, 2024). In the present study, the reliability was $\alpha$ = .87 for the exhaustion dimension, $\alpha$ = .77 for inefficacy, and $\alpha$ = .75 for depersonalisation.

In turn, student engagement is defined as a multidimensional construct that describes the level of active and emotional involvement of students in their learning process and in school activities. To measure the perception of student engagement, the adapted scale of Frenzel et al. (2018) was used, which comprises 4 items evaluated using a 4-point Likert scale (for example: "These students participate enthusiastically in the classes"). In their study, the scale displayed high internal consistency with a coefficient of reliability of $\alpha$ = .88.

Thirdly, teachers' emotions were measured. Teachers' emotions are defined as affective states that emerge during the exercise of the teaching profession, influenced by interactions with students, peers, families, and the educational context. These emotions can be positive, such as enjoyment and enthusiasm, or negative, such as stress and frustration. To evaluate the emotions linked to teaching, the TES scale (Frenzel et al., 2016) was used. This measures 3 principal emotions: enjoyment, anxiety, and anger. The scale comprises 12 items in groups of 4 for each emotion (for example: anxiety, "preparing to teach these students often causes me to worry"; anger: "teaching these students frustrates me"; enjoyment: "I enjoy teaching these students"). In the validation study conducted by Frenzel et al. (2016), the scale displayed high reliability, with a coefficient of reliability of $\alpha$ = .73 for enjoyment, and $\alpha$ > .80 for anger and anxiety. The reliability in the present study was $\alpha$ = .89 for enjoyment, $\alpha$ = .85 for anger, and $\alpha$ = .78 for anxiety.

Finally, the teacher-student relationship was measured. This is defined as the affective and professional link established between teachers and their students, characterised by emotional closeness, mutual respect, and trust. To evaluate this construct, the scale of Klassen et al. (2012) was used, which consists of 4 items such as "I feel connected to my students[1]", using a 4-point Likert scale. In the study by Klassen et al. (2012), this measure displayed high reliability ($\alpha$ = .80). In the present study, the reliability was $\alpha$ = .87.

## 2.4. Procedure

Authorisation was requested from the ethics committee of the institution sponsoring this research before collecting the data (CEBB 1399-2023). During September 2023, permission was requested from the local education authority in charge of the public establishments to be contacted in the Biobío region of Chile. After giving authorisation, this authority sent the survey to all of the teachers via SurveyMonkey in October 2023 and the survey remained open for 45 days. The universe of teachers who received the survey was 1792. Of these, 475 entered the platform but only 338 answered the survey, which is equivalent to 18.86% of the total contacted.

### 2.5. Data analysis

The variables were treated as average scores on the scale and therefore as quantitative variables. Missing values were replaced with the arithmetic mean. This meant that cases with missing data did not have to be eliminated and the sample size could be preserved in the analyses performed, giving the analyses greater statistical power.

Descriptive analyses were performed (mean, standard deviation, minimum and maximum values, skew and kurtosis) and fulfilment of the assumptions of the parametric techniques was verified, in particular the normality and homoscedasticity of the residuals. To test the proposed relationships, a moderate mediation analysis was subsequently performed using the SPSS program, version 25 and the Hayes PROCESS macro model 14, with 10 000 bootstraps (resampling) (Hayes, 2018).

## 3. Results

The final sample for the study comprised teachers from pre-school education to secondary education, as well as special educational needs teachers. The mean age of the teachers was 41.8 years (*SD* = 10.33), and on average they had 14.3 years of experience (*SD* = 9.48). Table 1 shows the details of the demographic characteristics of the teachers who took part in this research.

TABLE 1. Sociodemographic characteristics of participating teachers.

| Level at which they work | *n* | Male *(n)* | Female *(n)* | Binary/did not say *(n)* | Age *M(SD)* | Years of experience *M(SD)* |
|---|---|---|---|---|---|---|
| Pre-school education | 36 | 3 | 33 | 0 | 40.06(8.18) | 12.19(6.75) |
| Primary education | 145 | 25 | 116 | 1 | 42.03(9.77) | 14.73(8.87) |
| Secondary education | 120 | 39 | 80 | 1 | 41.93(11.24) | 14.43(10.72) |
| Primary and secondary education | 26 | 12 | 14 | 0 | 43.50(12.46) | 15.81(10.81) |
| Special education | 11 | 3 | 8 | 0 | 39.00(8.44) | 10.73(6.25) |
| Total | 338 | 82 | 254 | 2 | 41.80(10.33) | 14.31(9.48) |

No statistically significant differences were found by gender, age ($F_{(1.334)}$ = 1.023, $p$ = 0.313), or years of teaching experience ($F_{(1.334)}$ = 1.365, $p$ = 0.244). Nor were any statistically significant differences detected between men and women in any of the study variables ($p$ >0.05), except for perception of student engagement, where male teachers displayed a slightly lower perception ($M$ = 2.92; $SD$ = 0.66, $CI_{95\%}$ [2.78, 3.07]) when compared with women ($M$ = 3.09; $SD$ = 0.53, $CI_{95\%}$ [3.03, 3.16]) ($F_{(1.334)}$ = 5.415, $p$ = 0.021, $f$ = 0.116). The effect size of this comparison, according to Cohen, was very small.

In relation to teachers' emotions, the average values for enthusiasm (*M* = 3.48, *SD* = 0.53) and teacher-student relationship (*M* = 3.64, *SD* = 0.47) are between the categories of *agree* and *strongly agree* on the Likert scale used, indicating positive perceptions in these dimensions. In contrast, negative emotions like anger (*M* = 1.70, *SD* = 0.60) and anxiety (*M* = 1.87, *SD* = 0.60) are closer to the category of *disagree*, reflecting a lower perceived intensity in these emotions in the teaching work context.

With respect to the student engagement perceived by the teachers, a mean of 3.05 (*SD* = 0.58) was obtained, suggesting that, in general, participants tend to regard this aspect as closer to the *agree* category than *strongly agree*.

As for total burnout and its dimensions, the results show that, on average, teachers report experiencing these symptoms "a few times a month". Total burnout displayed a mean of 2.37 (*SD* = 0.92), with the exhaustion dimension being the highest (*M* = 3.51, *SD* = 1.38), followed by depersonalisation (*M* = 2.37, *SD* = 1.21), and inefficacy (*M* = 1.66, *SD* = 0.84).

The skew and kurtosis values indicate a normal distribution in the majority of the variables, with exceptions such as teacher-student relationship (kurtosis = 3.14, skew = -1.51) and inefficacy (kurtosis = 2.13, skew = 1.55), where more biased distributions are observed (Table 2).

TABLE 2. Descriptive statistics for teacher emotions, assessments, and burnout.

| **Teacher variables** | ***n*** | **Min.-Max.** | **Mean (*SD*)** | **Kurtosis** | **Skew** |
|---|---|---|---|---|---|
| Enthusiasm | 338 | 1-4 | 3.48 (.53) | 1.73 | -0.985 |
| Anger | 338 | 1-4 | 1.70 (.60) | 0.35 | 0.678 |
| Failure | 338 | 1-4 | 1.87 (.60) | 0.16 | 0.483 |
| Student engagement | 329 | 1-4 | 3.05 (.58) | 0.53 | -0.379 |
| T-S relationship | 314 | 1-4 | 3.64 (.47) | 3.14 | -1.51 |
| Total burnout | 317 | 1-7 | 2.37 (.92) | 0.88 | 1.03 |
| Exhaustion | 317 | 1-7 | 3.51 (1.38) | -0.49 | 0.44 |
| Inefficacy | 316 | 1-7 | 1.66 (.84) | 2.13 | 1.55 |
| Depersonalisation | 316 | 1-7 | 2.37 (1.21) | 1.03 | 1.19 |

The correlation analyses show that positive emotions, such as enjoyment and the teacher-student relationship, are negatively associated with total burnout and its dimensions, indicating that, with higher levels of these emotions, the levels of burnout and its components tend to reduce. In contrast, negative emotions such as anger and anxiety display significant positive correlations with total burnout and with the dimensions of exhaustion, depersonalisation, and inefficacy, suggesting that these emotions are associated with a higher level of teacher burnout. Similarly, the student engagement perceived by the teacher also displays a negative relationship with burnout and its dimensions, with its possible protective role against burnout being especially notable (Table 3).

Table 3. Correlation between teacher emotions and assessments regarding burnout and its dimensions.

| | Enjoyment [$CI_{95\%}$]* | Anger [$CI_{95\%}$] | Anxiety [$CI_{95\%}$] | Commitment [$CI_{95\%}$] | T-S relationship [$CI_{95\%}$] |
|---|---|---|---|---|---|
| Burnout | -.376** | .475 ** | .425** | -.333** | -.227** |
| | [-.277, -.467] | [.556,.385] | [.511,.330] | [-.231, -.427] | [-.119, -.329] |
| Exhaustion | -.309** | .415** | .383** | -.267** | -.136* |
| | [-.206, -.405] | [.502,.320] | [.473,.285] | [-.161, -.366] | [-.026, -.243] |
| Inefficacy | -.348** | .288** | .276** | -.275** | -.306** |
| | [-.247, -.441] | [.387,.184] | [.375,.171] | [-.169, -.374] | [-.202, -.403] |
| Depersonalisation | -.235** | .419** | .359** | -.252** | -.172** |
| | [-.128, -.337] | [.506,.324] | [.452,.259] | [-.146, -.353] | [-.062, -.277] |

Note: *[upper limit, lower limit]

Before the moderate mediation analysis, the assumptions of the regression were evaluated. The standardised residuals displayed a slight deviation from normality (skew = 0.993; kurtosis = 2.063) and a slight heteroscedasticity for higher predicted values. Although some extreme values were identified, no patterns that compromised the validity of the model were observed, and the use of bootstrapping mitigated possible effects of these deviations.

The results showed a significant total relationship between perceived student engagement and teacher burnout ($b$ = - 0.319; $p$ < 0.001). The moderate mediation analysis gave the following results:

Table 4. Results of the moderate mediation model.

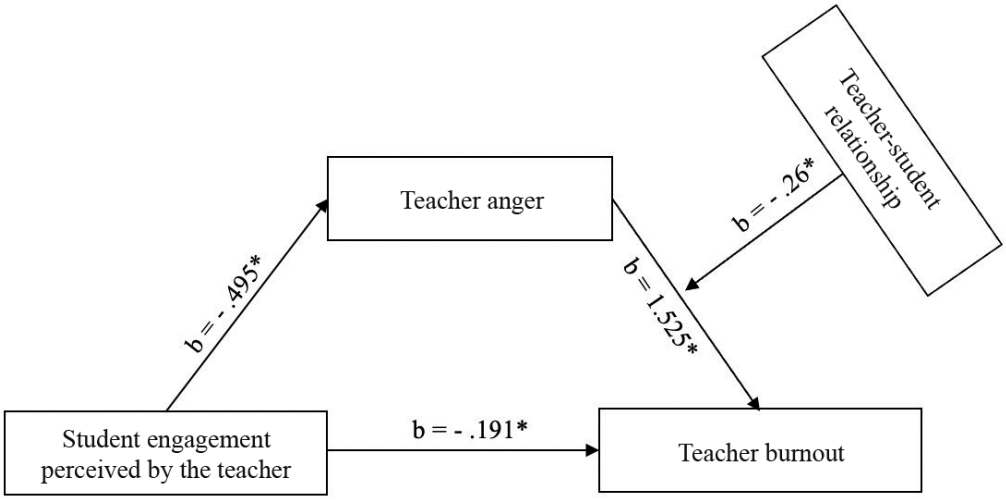
| | | | | | Bootstrap | |
|---|---|---|---|---|---|---|
| | ***b*** | **Standard error** | ***t*** | ***p*** | **CILL** | **CIUL** |
| Constant | 0.2801 | 1.0181 | 0.2751 | 0.7834 | -1.7227 | 2.2829 |
| Student engagement | -0.1914 | 0.0924 | -2.0722 | 0.0390 | -0.3731 | -0.0097 |
| Anger | 1.5261 | 0.4877 | 3.1292 | 0.0019 | 0.5667 | 2.4854 |
| TSR | 0.4611 | 0.2755 | 1.6740 | 0.0951 | -0.0807 | 1.0030 |
| Anger × TSR | -.2647 | 0.1334 | -1.9834 | 0.0481 | -0.5271 | -0.0022 |

Note: CILL = confidence interval lower limit; CIUL = confidence interval upper limit; TSR = teacher-student relationship.

The results indicated a significant relationship between perceived student engagement and teacher anger ($b$ = -0.495, $p$ <0.001), which suggests that the greater the engagement that teachers perceive in their students, the less their anger. This effect was robust, as confirmed by the bootstrap 95% confidence interval (CILL = -0.5941, CIUL = -0.3953).

When anger was included as a mediator, the direct effect of engagement on burnout was reduced, but it remained significant ($b$ = -0.191, $p$ = 0.039), indicating partial mediation. The bootstrap 95% confidence interval (CI) confirmed the effect, as it did not include the zero value (CILL = -0.3731, CIUL -0.0097). The indirect effect of engagement on burnout mediated by anger was significant at all levels of the moderator (teacher-student relationship), although its magnitude reduced as the teacher-student relationship improved. Specifically, the effects of teacher anger on burnout were higher when the teachers reported not so positive relationships with their students ($b$ = -0.26, $p$ = 0.0481, LLCI = -0.5271, ULCI -0.0022) (Figure 1).

FIGURE 1. Moderate mediation model: mediating role of anger and moderator role of the teacher-student relationship.




Note: $b$ = non-standardised coefficients.

The analysis of the moderated mediation showed that the impact of perceived student engagement on burnout through the mediator of anger was significant in all of the evaluated levels of the moderator (teacher-student relationship), although its magnitude reduced as the teacher-student relationship improved. Table 5 shows the indirect conditional effects of engagement on burnout.

TABLE 5. Indirect conditional effect of engagement on burnout through anger.

| Teacher-student relationship | Indirect effect | Standard error* | CILL* | CIUL* |
|---|---|---|---|---|
| 3.00 | -0.3622 | 0.0778 | -0.5390 | -0.2311 |
| 3.75 | -0.2640 | 0.0544 | -0.3782 | -0.1645 |
| 4.00 | -0.2313 | 0.0629 | -0.3642 | -0.1150 |

Note: *bootstrapping.

The results in Table 5 indicate that when the teacher-student relationship is perceived to be at its lowest level (3.00), the indirect effect of engagement on burnout is *b* = -0.3622. Meanwhile, with higher levels of teacher-student relationship (3.75 and 4.00), the effect of engagement on burnout falls to *b* = -0.2640 and *b* = -0.2313, respectively. In all cases, the confidence intervals did not include zero, which confirms that the indirect effect was statistically significant. This suggests that the anger mediator has a stronger impact on the relationship between engagement and burnout when the teacher perceives a poor teacher-student relationship and that this impact reduces as the perception of the teacher-student relationship improves.

## 4. Discussion

The aim of the present study was to analyse how student engagement perceived by teachers impacts their burnout, considering the mediating role of anger and the moderating role of the teacher-student relationship on this association. The findings confirm the proposed hypotheses, showing that higher levels of engagement perceived by the teacher are associated with lower levels of teacher anger, which in turn significantly reduces its effect on total burnout. It was also found that the teacher-student relationship moderates this relationship. That is to say, when teachers perceive not so positive relationships with their students, anger has a more profound effect on burnout. In contrast, when the relationships are more positive, this impact reduces significantly.

These results are in line with previous research that has shown how teachers' perception of low student engagement is associated with negative emotions such as frustration and anger (Frenzel et al., 2018; Yu et al., 2021), as well as with an increase in teacher emotional exhaustion (Burić et al., 2024), which in turn contributes to their symptoms of burnout (Chang, 2013; Covell et al., 2009; Wang & Burić, 2023). Equally, the results support the notion that the teacher-student relationship acts as a key protective factor, favouring greater professional well-being for teachers (Dreer, 2023; Spilt et al., 2011), increasing their enjoyment, reducing their emotional exhaustion (Taxer et al., 2019), and increasing their job satisfaction (Lavy & Bocker, 2018). The moderating role encountered in this study also agrees with other pieces of research that have identified conflictive relationships with students as a risk factor that intensifies emotional exhaustion and negatively affect teachers' well-being (Rodríguez-Mantilla & Fernández-Díaz, 2017).

From the perspective of the job demands and resources model, these findings can be understood given that the availability of resources influences the teacher's capacity to confront the demands of the job (Demerouti, et al., 2001; OCDE, 2019; Viac & Fraser, 2020). In this sense, strengthening job resources such as perceived student engagement and the teacher-student relationship can lessen the effect of teacher anger understood as a demand.

In practical terms, the importance of improving student engagement stands out as an indirect strategy for reducing teacher stress. When the students are motivated, participate actively and meet their school responsibilities, this favours positive emotions in the teacher. Some key strategies for improving student engagement include creating opportunities for participation in school activities and extra-academic events, something that strengthens the sense of belonging and the connection to the school (Eccles et al., 2003; Pérez-Salas et al., 2021; Pérez-Salas et al., 2019; Galarce et al., 2019). It is also crucial to constantly monitor indicators such as attendance, academic performance, and respectful relationships, with the aim of identifying signs of school disconnection in time and being able to intervene effectively (Lehr et al., 2004; Sinclair et al., 2003; Wilder Research Center, 2003). Finally, teaching people constructive conflict resolution strategies can be a powerful tool to help students face challenges effectively, something that has a positive effect on the classroom climate (Sinclair et al., 2003).

Beyond the interventions aimed at students, one even more relevant strategy is to work with teachers on the assessment and attribution of student behaviour given that, independently of students' real behaviour, the way teachers interpret it and the causes to which they attribute

it (internal or external) can be decisive for their well-being (Chang, 2009; Weiner, 1985). In this sense, training teachers in cognitive reinterpretation strategies and more adaptive attributions of the students' behaviour could be an effective intervention to reduce the negative impact of anger.

Similarly, the results underline how strengthening the teacher-student relationship is a key resource for mitigating the negative effects of anger on teaching practice. A relationship characterised by mutual respect, trust, and emotional support can protect against stress and promote a more positive learning environment (Roorda et al., 2011; Split et al., 2011). This suggests a need to train teachers in effective strategies for communication, conflict management, and empathy. Moreover, school initiatives that foster spaces for positive interaction between teachers and students, such as personalised tutorials or extracurricular activities, might be especially useful to strengthen these healthy bonds.

Finally, it is fundamental to develop strategies for managing anger in teachers. When not adequately regulated, anger can contribute significantly to emotional depletion and to burnout, affecting not only the teacher but also the quality of teaching and the classroom environment. Training programmes in emotional regulation skills, based on focuses such as cognitive behavioural therapy or mindfulness, could provide practical tools for adaptive management of emotions (Kemeny et al., 2012; Von der Embse et al., 2019).

One of the principal limitations of this study is missing data, as approximately 30% of the participants who accessed the survey did not complete it. This dropout rate might have introduced self-selection bias into the results, given that teachers with higher levels of exhaustion or less perceived student engagement might have been less likely to complete the questionnaire.

Similarly, the sample only included publicly run schools in urban settings with a low socio-economic level, which limits the possibility of generalising the findings to other educational contexts. Although the results provide valuable evidence about the dynamic between perceived student engagement, teachers' emotions, and burnout in this particular group of teachers, future research should expand the range of contexts to evaluate the generalisation of these effects in different school realities.

Another limitation to consider is the absence of contextual variables that could have enriched the analysis, such as institutional policies, working conditions, or administrative support within each school. These factors could affect teacher well-being and emotional depletion, modulating the impact of perceptions on student engagement. Including these elements in future studies would make it possible to obtain a more holistic understanding of the phenomenon and of its relationship with the organisational setting in which the teachers operate.

Finally, one aspect that deserves special attention in future research is evaluation of student disengagement along with perceived engagement. A lack of interest and participation by students can not only be interpreted as an absence of engagement, but it could also represent an additional emotional demand for teachers, increasing their levels of stress and exhaustion. Examining the coexistence of these two phenomena and their joint impact on the teaching experience would make it possible to obtain a more complete vision of the emotional processes that influence teacher burnout and occupational health.

Despite these limitations, this study provides valuable evidence for the role of perceived student engagement and the teacher-student relationship as job resources that can mitigate the impact of emotional demands on teaching work. The findings suggest that boosting student engagement and the affective links between teachers and students not only contributes to a school climate that is more positive and beneficial for students (Pérez-Salas et al., 2021), but that it also reduces the emotional burden and stress of teachers, promoting their well-being and job satisfaction. This study also provides empirical evidence for the moderating role of the teacher-student relationship on the association between anger and burnout, underlining the relevance of strengthening it in interventions aimed at teachers' occupational health.

## Authors' contributions

**Claudia Pérez-Salas:** Conceptualisation; Formal analysis; Funding acquisition; Methodology; Writing (original draft); Writing (review and editing).

**Isidora Zañartu:** Data curation; Research; Writing (original draft); Writing (review and editing).

**Yasna Chávez-Castillo:** Data curation; Research; Writing (original draft); Writing (review and editing).

**Viviana Rodríguez-Díaz:** Methodology; Writing (original draft); Writing (review and editing).

## Artificial intelligence (AI) policy

The authors do not declare to have used artificial intelligence (AI) in the preparation of this article.

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## Note

[1] In the original version, the items referred to students in general. However, in the present study, the items were adapted into Spanish and modified to refer specifically to a particular class, rather than to students in general. For example, the item "I feel connected to my students" was adapted to "I feel connected to the students in this class".

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