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# *The emotional well-being of teachers and school personnel: An experience sampling study*

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The present study addresses the concern for the well-being of teachers and school personnel by examining the efficacy of a multicomponent positive psychology intervention aimed at enhancing emotional well-being in the school environment. The study design comprised a clustered randomized controlled trial, targeting teachers and school personnel working in Finnish basic education. Data collection encompassed the utilization of both the Experience Sampling Method (ESM, n = 241) to assess state-like emotions and questionnaires (n = 245) to evaluate trait-like emotions. The results showed a post-intervention increase in state-like distinct emotions of interest and a trend towards increased engagement in the intervention group, and conversely, increased stress in the control group. Positive trait-like emotions increased in the intervention group post intervention. The intervention further resulted in decreased stress and loneliness amongst teachers and school personnel when in the company of students, and decreased stress while working. The results indicate that positive psychology interventions may be efficacious in enhancing teachers' emotional well-being. Additionally, assessing both state- and trait-like emotions contributes to a broader understanding of this efficacy, whilst measuring teachers' experienced emotions can increase ecological validity.

**Keywords**: positive psychology, teachers, positive emotions, experience sampling method.

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## Introduction

Teacher stress remains a persistent concern both before, during, and after the COVID-19 pandemic (Santamaría et al., 2021). Stress further contributed to high attrition rates, resulting in current global concerns

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regarding the maintenance of an adequate and competent teacher workforce (Harmsen et al., 2018; OECD, 2018). Acton and Glasgow (2015) propose that managing emotional labour is important in retaining teachers within their profession. Emotions are integral to educational settings and central components in teaching (Hargreaves, 1998) and learning (Fried et al., 2015). However, most research has focused on negative emotions in teaching (Linnenbrink-Garcia & Pekrun, 2014), such as stress (McCarthy, 2019), emotional exhaustion, and burnout (Skaalvik & Skaalvik, 2009). This research, which concerns the well-being of teachers and school personnel in the Flourishing Schools program (to be discussed in the forthcoming sections), examines positive emotions and teacher well-being (Rusu & Colomeischi, 2020) and resilience (Gloria & Steinhardt, 2016). Studies have indicated the benefits of positive emotions on stress (Burns et al., 2008), and link positive emotions to resilience (Beltman et al., 2011; Bullough & Pinnegar, 2009; Gloria & Steinhardt, 2016). Distinct positive emotions such as joy, contentment, and interest have been positively related to improved psychological well-being (Cohn & Fredrickson, 2011; Fredrickson, 2003; Tugade et al., 2021). Additionally, interest as a distinct emotion has been associated with teacher well-being (Schiefele et al., 2013). Consequently, positive emotions are considered to be important assets within the school work environment. (Linnenbrink-Garcia & Pekrun, 2014; Pekrun et al., 2002).

*Positive psychology interventions*

Well-being intervention programs cultivating positive emotions are often considered suitable in preventing problems rooted in negative emotions such as stress (Fredrickson, 2000). Intervention programs that enhance teacher well-being have positively influenced both teacher-student relationships (Jennings & Greenberg, 2009) and students' well-being (Spilt et al., 2011). It is thus important to develop, implement and evaluate programs that enhance teachers' well-being and positive emotions.

A positive psychology intervention (PPI) program can be defined as theoretically and empirically based activities aimed at enhancing positive feelings, behaviours, and cognitions that increase well-being and resilience (Hendriks et al., 2020). The primary objective of PPIs is to capitalize on positive emotions by promotion of positive skills, which can be at different levels: single, limited number or, as in the current study, multiple positive skills. A multicomponent PPI consists of a diverse range of evidence-based exercises, focusing on two or more well-being components or pathways consistent with positive psychology theory (Carr et al., 2020; Hendriks, 2020). An example of theoretical components is Seligman's (2011) PERMA model (Positive emotion, Engagement, Relationships, Meaning, and Accomplishment) that comprises five pillars, which together facilitate flourishing, defined as optimal functioning and well-being. Positive emotions have been described both as markers of flourishing and, when experienced momentarily and over time, as producers of flourishing (Fredrickson, 2001).

Meta analyses show that PPIs successfully enhance well-being and alleviate stress (Carr et al., 2020). In work environments, PPIs have also been found to improved employees' positive emotions, well-being, and work engagement (Donaldson et al., 2019). PPIs particularly influence positive emotions, which in turn are the primary pathways through which PPIs may influence well-being (Moskowitz et al., 2021). Positive and

negative emotions, which are integral components of well-being, are also notably receptive to situational influence and efforts to change and enhance momentary or long-term affective states (Larsen, 2009), which are traditional objectives of PPI-studies (Hendriks, 2020).

*Emotional well-being*

The current study uses the term emotional well-being to describe emotions in terms of a high level of positive emotions and low level of negative emotions. Larsen (2009) defines emotional well-being as follows:

> Emotional well-being (EWB) can be conceived of as a composite of PA (positive affect) and NA (negative affect) that comes and goes and has a momentary character reflecting one's emotional status quo at any given moment. As these momentary states accumulate over time, they summate into something like a running composite, such that they begin to reflect a central tendency or characteristic level of EWB, around which the person fluctuates. (p. 249)

Larsen highlights the importance of distinguishing between state- and trait-like emotions to gain a comprehensive understanding of the changeability of emotional well-being. The consideration of the dynamic nature of emotional states is essential to their study and evaluation (Mauss, & Robinson, 2009; Robinson & Clore, 2002). Trait-like emotions, typically assessed through questionnaires, are presumed to remain relatively stable over time and across various contexts. This contrasts with state-like emotions, which are considered context-specific and subject to variation based on the situation. In view of the interactive nature of the teaching occupation, it is important to emphasize this distinction when evaluating emotions at the school workplace (Keller et al., 2014). A reliable evaluation of state-like emotions requires a consideration of their changeability at a specific moment and within a specific context, while trait-like emotions are evaluated over a period of time (Hektner et al., 2007). There is a notable gap in research on teachers' emotions on the use of various and different assessment techniques, including broad self-report surveys and real-time assessments such as the experience sampling method (Larsen, 2009). To gain a comprehensive understanding of teachers' momentary emotional well-being in the classroom and over time, it is imperative to conduct studies of this nature (Keller et al., 2014).

Positive and negative emotions asymmetrically influence emotional well-being. Negative emotions are usually characterised by a negativity bias and are often experienced more intensely than positive emotions (Larsen, 2009). This asymmetry can be altered by experiencing positive emotions more frequently than negative emotions, resulting in improved management of intense negative emotions (Fredrickson, 2013). Enhanced levels of positive emotions resulting from participating in positive activities of Positive Psychology Interventions (PPIs) can provide both a psychological break from stress and support coping resources (Folkman 1997; Moskowitz et al., 2020). Fredrickson's broaden-and-build theory (2013) suggests that positive emotions broaden our attention and widen our thought-action repertoires; in contrast, negative emotions narrow these to a limited set of behavioural options. Teachers experiencing high levels of emotional well-being may thus adapt better to challenges in their work environment and to the negative effects of stress compared to teachers with lower levels of emotional well-being.

*Objectives of the study*

This study aims to assess the efficacy of the Flourishing Schools program which seeks to enhance the well-being of teachers and school personnel. The basis of measuring intervention efficacy is the extent of positive change in emotional well-being following an intervention. Situational and momentary change in emotional well-being is arguably most appropriately assessed in the present moment, for which experience sampling is a recommended assessment method (Hektner, 2007; Larsen, 2009). Meta analyses show that studies using both ESM and traditional questionnaires to assess and distinguish between teachers' state and trait-like emotions, are scarce (Keller et al., 2014). The current study thus aims to assess potential post-intervention change in the participating teacher's state-like emotions experienced in the school work context using ESM. An additional aim is to assess potential change in the participating teacher's trait-like emotions, using traditional questionnaire data collected at pre- and post-intervention, and at a 6-month follow-up.

This study was guided by two main hypotheses. Firstly, based on ESM data, we hypothesized (1a) that the intervention teachers would experience an increase in their momentary experienced positive emotions and a decrease in their momentary experienced negative emotions. Furthermore, the ESM data enabled us to examine the work-context influence on the intervention's emotional outcome. Based on this ESM data, we hypothesized (1b) that the intervention group would experience an increase in their momentary experienced positive emotions and a decrease in their momentary experienced negative emotions, either while working or while in the company of pupils or colleagues, from pre- to post-intervention. Secondly, based on questionnaire data, we hypothesized (2a) that the participating teachers and school personnel would experience an increase in their estimated emotional well-being, measured at pre- and post-intervention. Finally, we hypothesized (2b) that such an intervention effect would be sustained at a 6-month follow-up.

## Methodology

The Flourishing Schools intervention program was designed as a multicomponent PPI to increase well-being, and thus decrease and prevent the risks of stress (cf. Norrish, 2015). The term flourishing refers to a holistic, multidimensional, developmental approach to well-being (Seligman, 2011). The Flourishing Schools program aims to optimize the well-being of its participants by using a broad set of theoretically relevant components such as Seligman's (2011) PERMA-model. The content of the intervention program, listed in Table 1, consisted of eight theoretical well-being sessions developed from positive psychology (e.g. Fox Eades, 2008; Norrish, 2015).

Table I. Theoretical components and content of the Flourishing Schools program.

| Theme of course | Content of course sessions |
|---|---|
| 1. Values | Introduction, Well-being, Values, Mindfulness, Positive emotions |
| 2. Strengths | VIA character strengths, Virtues, Core strengths, Over-use and under-use |
| 3. Strengths in others | Strengths in colleagues; in pupils and in the whole school, Self-compassion |
| 4. Positive relations 1 | Meaning, Mindful presence, Positive resonance with others, Compassion, Relationships |
| 5. Positive relations 2 | Motivation systems, Active constructive responding, Conflict management |
| 6. Mindset and hope | Dynamic vs. static mindset, Mindset with pupils, Realistic hopefulness, Smart goal setting, Motivation |
| 7. Resilience | Mindful presence, Coping, Internal and external resources |
| 8. Engagement and flow | Engagement, Flow in the school work-place, Accomplishment |

The program sessions were held throughout the school year of 2017–2018, over a total of 27 hours. The sessions began with a review and discussion of the theme of the previous session and accompanying home assignments. During the sessions theory was combined with practical exercises, discussions, group work, and personal reflections to encourage engagement and active participation. The sessions were implemented by members of the research team in the form of in-house training. The Flourishing Schools intervention program was planned and designed as a cluster randomized controlled trial, comparing groups between different measurement occasions.

The use of ESM in the current study concerns its provision for momentary and context-specific data. Using context-specific data is relevant to studies in educational settings (Keller et al, 2014; Zirkel et al., 2015) that consider the links between teachers' adaptation to stress and how they balance the challenges in their work environment with their psychological resources (McCarthy, 2019).

The study was approved by the University of Helsinki Ethical Review Board, in the Humanities and Social and Behavioural Sciences.

*Participants*

Based on their interest to take part in the program, seven schools were chosen to participate. The schools were then randomly allocated as intervention schools (n = 4) and control schools (n = 3). Intervention participants comprised 144 teachers and school personnel; an additional 101 teachers and school personnel functioned as a control group. The control group did not participate in the intervention at any stage. Instead, they received

corresponding information about positive psychology in writing.

The sample initially comprised 267 teachers and school personnel who worked with pupils from grades 1 to 9 (aged 6–15) in basic education schools in Finland. After the study's initiation, 22 teachers and school personnel did not complete the web-based questionnaire. ESM data from 16 teachers and school personnel were lost due to technical difficulties with the ESM phone app. ESM data from a further 10 teachers and school personnel were removed due to (1) not answering, (2) inconsistency in answering, (3) the time interval for answering extending 5 days or (4) the response time exceeding the limit of 15 minutes. This amounted to the exclusion of 962 momentary assessments (8%) from the total 12,059 assessments before the analysis. The analysed questionnaire data comprised answers from 245 teachers and school personnel, of whom 10 answered the web-based questionnaire but not the ESM phone app. The analysed ESM data comprised answers from 241 teachers and school personnel, of whom 6 answered the ESM phone app but not the web-based questionnaire. In total, 235 teachers and school personnel answered both the web-based questionnaire and the ESM phone app.

*Questionnaire*

Of the 245 participants answering the web-based questionnaire, the majority were teachers (80.4%). The remaining participants worked as administrative-, kitchen- and maintenance personnel (7.7%), health care personnel (2.9%), teacher assistants (5.7%), and afternoon personnel/other work duties (3.3%). The rationale for including school personnel other than teachers in the intervention program, was to support the well-being of all personnel working in the schools. As most participants were teachers, and to avoid repetitive and lengthy descriptions of the sample, the participants will be referred to as teachers from now on.

The percentage of males who answered the questionnaire was 14.3% and 85.7% were females. The teachers' age distribution was divided into three groups: 33.3% aged between 21–37 years, 34.6% between 38–46, and 32.1% between 47–62.

The questionnaire was answered by 239 teachers at pre-intervention, 176 at post-intervention, and 94 at the 6-month follow-up. Of these, 170 (n = 106 intervention, n = 64 control) answered the questionnaire on two measurement occasions, and 82 (n = 45 intervention, n = 37 control) answered on all three measurement occasions.

*Experience Sampling Method*

Of the 241 teachers who answered the ESM phone app questionnaire, 224 answered pre-intervention, 214 at post-intervention, and 200 answered on both occasions (120 intervention, 80 control). Of the 241 teachers who answered the ESM, 12.3% were males and 87.7% were females. There was equal distribution across three age groups with, 33.5% aged between 21–37 years, 35.2% between 38–46, and 31.3% between 47–62. A total of 11 097 assessments were completed, with 6 330 assessments (3 714 intervention, 2 616 control) completed pre-intervention and 4 767 assessments (2 798 intervention, 1 969 control) post-intervention.

*Procedure*

The Flourishing Schools study was evaluated using ESM and web-based self-report questionnaires on three occasions, namely (1) in autumn 2017, at the beginning of the school year (pre-intervention), (2) in spring 2018 (post-intervention), and (3) in autumn 2018, 6 months after the intervention (follow-up), to assess potential long-term effects.

*Measures of positive and negative emotions*

The teachers self-reported their emotional well-being via questionnaires containing questions from validated scales. The positive and negative emotion subscales of the PERMA-Profiler (Butler & Kern, 2016) was used to assess positive and negative emotions. The positive emotion subscale has three items formulated into Likert scale-type questions: in general, how often do you feel (1) joyful, (2) positive, and (3) to what extent do you feel content (0 = *not at all* to 10 = *completely*). Similarly, the PERMA negative emotions sub-scale has three Likert scale-type questions: "in general, how often do you feel (1) anxious, (2) angry, and (3) sad (0 = *never* to 10 = *always*). Cronbach's alpha coefficient for the positive emotion subscale was 0.88, and 0.72 for the negative emotion subscale, indicating good internal consistency (Butler & Kern, 2016).

The Positive and Negative Affect Schedule (PANAS) (Watson et al., 1988) comprises 10 positive and 10 negative distinct emotions graded on a Likert scale (1 = *very slightly or not at all* to 5 = *extremely*). The scores range from 10 (low) to 50 (high). The positive emotion items are interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active. The negative emotion items are distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, and afraid. Alpha coefficients for the positive and negative emotion items measured with PANAS were both 0.84, which indicates good internal consistency (Watson et al., 1988).

*ESM measures*

Administration of the ESM involved a phone app (www.psymate.eu) developed to suit the purposes of the study. The ESM phone app was used to evaluate ten emotional states, encompassing five positive emotions (joyful, calm, content, interested, engaged) and five negative emotions (annoyed or angry, worried or anxious, sad, lonely, and stressed), with the intention of increasing the ecological validity of momentary experienced emotions. These distinct emotion items were collaboratively developed for this study by our research team in conjunction with experts from prior ESM research (Komulainen et al., 2014; Vella-Brodrick et al., 2014) and the creators of the PsyMate app.

To maintain consistency with recommendations from the creators of the PsyMate app and the researchers from the previous ESM studies, a 7-point Likert scale was employed. Respondents were presented with statements like "I am currently feeling X" (where X represented an emotion such as interested or stressed), and they were asked to rate these statements on a 7-point scale ranging from 1 (not at all) to 7 (extremely). The Cronbach's alpha for the positive emotion items was 0.83, and 0.78 for the negative emotion items.

The teachers assessed their positive and negative emotions using the phone app at eight semi-randomly chosen occasions per day for a period of five days, pre- and post-intervention. The app urged the teachers to self-report between 07.30 and 22.30 by signalling semi-randomly at intervals of 90 minutes. To ensure real-time data, answers were required within a time frame of 15 minutes. The ESM further enabled real-time data collection by defining time and company; while reporting on their levels of emotion, teachers informed whether they were at work and whether they were with colleagues or pupils, or both.

*Data analysis*

Linear mixed models (LMM) featured in the IBM SPSS (version 25.0) was deemed suitable for data involving repeated measurement occasions (Field, 2013). LMM allow for analysis of the 2-level structure of the ESM data with repeated 5-day assessments at level 1 and assessments nested within teachers at level 2. We set the significance level at 5%, with multiple comparisons using Bonferroni tests.

The LMM analysis provided estimated marginal mean values of the experienced emotions, adjusted by the teachers' gender and school as reported in the results section and Tables III and IV. At each measurement occasion, the estimated marginal means of the control and intervention groups were compared with multiple assessments. Additionally, post hoc tests were performed for all models to compare between- and within-group differences in the estimated marginal means of the emotions at each measurement occasion. We used a restricted maximum likelihood estimation method (REML) for estimating all models. The three models conducted in the analysis used random intercept models.

Cohen's *d* (Cohen, 2013) was used to calculate the effect sizes of the outcome variable at each measuring point by dividing the mean by the unadjusted pooled standard deviation at pre-intervention. Within psychological research and research relevant to the topic of the current article, effect sizes can be considered medium and statistically sufficient at 0.2 and strong at 0.4 (Funder & Ozer, 2019).

All models included the factors time (pre- and post-intervention, or pre- and post-intervention and 6-month follow-up), group (control and intervention), and gender, with the interaction between time and group as fixed effects. Model 1 (questionnaire data) and model 2 (ESM) also included the variable 'school' as a random effect.

In the ESM data analysis, models 2 (momentary emotions) and 3 (momentary situated emotions) included replicated signals as a random effect to analyse the 5-day pre- and 5-day post-intervention assessments. We analysed the three-way interaction between time, group, and context (model 3) to examine the teachers' emotions situated within context.

Before reducing the ESM-collected distinct emotion items into variables of positive or negative emotions, a principal component factor analysis was conducted with Varimax rotation on the person-mean-centred emotions. A Kaiser-Mayer-Olkin (KMO) measure and Bartlett's sphericity test resulted in values over 0.70 ($p < .05$) (Field, 2013). T-tests conducted pre-intervention indicated no significant deviation in emotions between the control and intervention groups.

**Results**

Table II reports the mean values of the teachers' emotions measured at each time point while Table III presents the results from the mixed model analysis with the estimated marginal mean score of the teachers' emotions (PERMA, PANAS, and ESM), and distinct emotion items (ESM).

Table II. Descriptive statistics of the teachers' positive (pos) and negative (neg) emotions on the PANAS and PERMA scales on three occasions, and with ESM on two occasions.

| | Pre-intervention | | | | Post-intervention | | | | 6-month follow-up | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Intervention | | Control | | Intervention | | Control | | Intervention | | Control | |
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| PANAS pos. | 35.4 | 5.16 | 35.4 | 4.92 | 35.5 | 5.56 | 34.5 | 5.42 | 35.9 | 4.98 | 35.9 | 4.49 |
| PANAS neg. | 19.6 | 5.78 | 19.3 | 5.55 | 19.2 | 5.48 | 19.5 | 6.15 | 19.0 | 5.22 | 18.8 | 6.05 |
| PERMA pos. | 7.66 | 1.34 | 7.78 | 1.40 | 7.94 | 1.12 | 7.71 | 1.48 | 7.82 | 1.16 | 7.96 | 1.28 |
| PERMA neg. | 4.16 | 1.85 | 3.81 | 1.61 | 3.99 | 1.80 | 3.64 | 1.74 | 4.23 | 2.00 | 3.52 | 1.72 |
| ESM pos. | 4.56 | 1.09 | 4.51 | 1.06 | 4.64 | 1.10 | 4.63 | 1.15 | | | | |
| ESM neg. | 1.98 | 0.89 | 1.91 | 0.93 | 1.97 | 0.97 | 1.83 | 0.88 | | | | |

**Notes:** *M* Mean; *SD* Standard deviation; PANAS scale 1–5 (range 10–50); PERMA scales 1–10; ESM emotion variable scale 1–7.

Table III. Estimated results of mixed linear model analysis of distinct emotions experienced in the work context. Only significant findings are reported.

| | Pre-intervention | | | | Post-intervention | | | | Mixed model analysis |
|---|---|---|---|---|---|---|---|---|---|
| | Intervention | | Control | | Intervention | | Control | | Time*Group |
| | *M* | *SE* | *M* | *SE* | *M* | *SE* | *M* | *SE* | *p* |
| With colleague | | | | | | | | | |
| Stressed | 2.94 | 0.09 | 2.72*** | 0.11 | 2.89 | 0.09 | 2.91*** | 0.11 | 0.000 |
| Worry | 2.13 | 0.09 | 1.90* | 010 | 2.07 | 0.10 | 2.03* | 0,10 | 0.041 |
| With pupils | | | | | | | | | |
| Stressed | 3.32* | 0.13 | 3.06 | 0.13 | 3.16* | 0.13 | 3.16 | 0.14 | 0.018 |
| Lonely | 1.52* | 0.08 | 1.50 | 0.93 | 1.44* | 0.81 | 1.56 | 0.95 | 0.017 |
| | | | | | | | | | |
| At work | | | | | | | | | |
| Stressed | 3.33** | 0.11 | 3.03* | 0.12 | 3.19** | 0.11 | 3.16* | 0.12 | 0.001 |
| Worry | 2.07 | 0.09 | 1.95** | 0.10 | 2.05 | 0.09 | 2.09** | 0.10 | 0.022 |

Ntoes: *M* Estimated marginal mean; *SE* Standard error; *d* Cohen's *d*, *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

*Intervention efficacy on state-like emotions*

The results showed no significant difference between pre- and post-intervention regarding the general mean values of positive or negative emotions collected with ESM. However, when examining the ESM data,

significant interaction effects were observed for the distinct emotions *interest* (F [2622,914] = 4.225, $p = .040$), *engagement* ($F$ [2730,585] = 4.490, $p = .034$), and *stress* ($F$ [3304,910] = 15.901, $p < .001$). This model did not result in significant differences between groups in terms of distinct negative or positive emotions. Interestingly, within the intervention group, an increase in interest ($p = .019$, $d = 0{,}10$) was observed after the intervention, contrasting with a slight rise in stress ($p < .001$, $d = 0.22$) observed within the control group.

*Intervention efficacy on state-like emotions within social- and work context*

Table IV presents the results of the mixed model analysis of the distinct emotion items self-reported *while at work* (n = 241), *with pupils* (n = 230), and *with a colleague* (n = 241). Significant interaction effect was observed in the three-way interaction between time, group, and context, only regarding distinct negative emotions. The analysis of the teachers' distinct emotion stress resulted in significant interaction effects; while at work ($F$ [974,368] = 13.959, $p < .001$), with pupils ($F$ [2617,410] = 5.606, $p = .018$), and with a colleague ($F$ [2423,089] = 8.648, $p = .003$). Additionally, the results revealed significant interaction effects in relation to teachers' feelings of worry; while at work ($F$ [66,246] = 5.462, $p = .022$) and while in the presence of a colleague ($F$ [2713,668] = 4.198, $p = .041$). Furthermore, a significant interaction effect was noted for teachers' experience of loneliness ($F$ [1236,613] = 5.684, $p = .017$) in the presence of their pupils.

The outcomes of multiple comparisons conducted within the intervention and control groups, regarding distinct emotions experienced in specific contexts, revealed significant changes in stress, worry, and loneliness. Following the intervention, stress levels decreased among teachers in the intervention group while at work (adjusted $MD = -.206$, $SE = .052$, $p > .001$) and in the presence of their pupils (adjusted $MD = -.158$, $SE = .071$, $p = .026$). Conversely stress increased within the control group after the intervention, when in the company of a colleague (adjusted $MD = -.272$, $SE = .084$, $p = .001$). Furthermore, the findings indicated a significant post-intervention increase in worry among the control group of teachers when they were working (adjusted $MD = -.135$, $SE = .049$, $p = .008$) and when they were in the presence of a colleague (adjusted $MD = -.132$, $SE = .067$, $p = .050$). Lastly, there was a post-intervention decrease in feelings of loneliness among the teachers in the intervention group when they were in the presence of their pupils (adjusted $MD = -.076$, $SE = .038$, $p = .049$).

The outcomes of the multiple comparisons conducted between the intervention and control groups did not reveal any significant post-intervention change in distinct emotions experienced in specific contexts. However, these findings did indicate noteworthy differences between the two groups, before the intervention took place, in relation to stress and worry. Before the intervention was implemented, stress levels were significantly higher in the intervention group in comparison to the control group while at work (adjusted $MD = -.321$, $SE = .129$, $p = .015$) and when in the company of a colleague (adjusted $MD = -.329$, $SE = .152$, $p = .034$). The results furthermore showed that the intervention group experienced higher levels of worry when in the presence of a colleague (adjusted $MD = -.228$, $SE = .111$, $p = .042$), before the intervention.

Table IV. Estimated results of effect sizes and mixed linear model analysis of the interaction between time*group of general positive (pos) and negative (neg) emotions and distinct emotions

| | Intervention | | | | | Control | | | | | Group difference | | Mixed model analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pre-int. | | Post-int. | | Within group | Pre-int. | | Post-int. | | Within group | Pre-int. | Post-int. | Time*Group |
| | *M* | *SE* | *M* | *SE* | *d* | *M* | *SE* | *M* | *SE* | *d* | *d* | *d* | *F(p)* |
| PANAS-pos | 35.0 | 0.50 | 35.0 | 0.57 | 0.01 | 34.7 | 0.57 | 34.1 | 0.67 | -0.11 | 0.05 | 0.17 | 0.65 (0.422) |
| PANAS-neg | 19.9 | 0.59 | 19.7 | 0.63 | -0.04 | 19.2 | 0.65 | 20.2 | 0.71 | 0.18 | 0.11 | -0.10 | 2.63 (0.107) |
| PERMA-pos | 7.60 | 0.13 | 7.83* | 0.17 | 0.17 | 7.63 | 0.16 | 7.52 | 0.17 | -0.08 | -0.02 | 0.23 | 4.84 (0.030) |
| PERMA-neg | 4.06 | 0.19 | 4.08 | 0.20 | 0.00 | 3.74 | 0.19 | 3.70 | 0.21 | -0.01 | 0.08 | 0.09 | 0.07 (0.798) |
| | | | | | | | | | | | | | |
| ESM pos | 4.52 | 0.06 | 4.55 | 0.06 | 0.04 | 4.53 | 0.07 | 4.49 | 0.07 | -0.07 | 0.07 | 0.11 | 3.23 (0.072) |
| ESM neg | 2.08 | 0.06 | 2.11 | 0.06 | 0.05 | 2.03 | 0.07 | 2.11*** | 0.07 | 0.16 | 0.10 | -0.01 | 3.28 (0.070) |
| Joyful | 4.71 | 0.07 | 4.72 | 0.07 | 0.01 | 4.84 | 0.08 | 4.78 | 0.09 | -0.10 | -0.20 | -0.09 | 0.21 (0.151) |
| Calm | 4.58 | 0.09 | 4.62 | 0.09 | 0.05 | 4.58 | 0.10 | 4.55 | 0.10 | -0.04 | -0.02 | 0.09 | 0.15 (0.221) |
| Content | 4.87 | 0.08 | 4.81 | 0.08 | -0.08 | 4.81 | 0.08 | 4.75 | 0.08 | -0.09 | 0.09 | 0.10 | 0.03 (0.871) |
| Engaged | 4.10 | 0.08 | 4.17 | 0.09 | 0.09 | 4.08 | 0.09 | 4.03 | 0.09 | 0.08 | 0.03 | 0.18 | 4.49 (0.034) |
| Interested | 4.39 | 0.10 | 4.47* | 0.10 | 0.10 | 4.40 | 0.11 | 4.38 | 0.11 | -0.04 | -0.01 | 0.13 | 4.23 (0.040) |
| Annoyed | 2.24 | 0.07 | 2.23 | 0.07 | -0.02 | 2.25 | 0.08 | 2.25 | 0.08 | 0.00 | -0.01 | -0.04 | 0.09 (0.762) |
| Worried | 1.94 | 0.08 | 2.01* | 0.08 | 0.09 | 1.88 | 0.09 | 2.01*** | 0.09 | 0.19 | 0.09 | -0.01 | 2.77 (0.096) |
| Sad | 1.65 | 0.07 | 1.72** | 0.07 | 0.12 | 1.66 | 0.08 | 1.70 | 0.08 | 0.06 | -0.02 | 0.04 | 0.93 (0.336) |
| Stressed | 2.94 | 0.09 | 2.89 | 0.09 | 0.05 | 2.72 | 0.10 | 2.91*** | 0.11 | 0.22 | 0.25 | -0.02 | 15.90 (<0.001) |
| Lonely | 1.63 | 0.08 | 1.68 | 0.08 | 0.08 | 1.68 | 0.08 | 1.73* | 0.09 | 0.08 | -0.10 | -0.09 | 0.01 (0.911) |

Notes: *M* Estimated marginal mean; *SE* Standard error; *d* Cohen's *d*, *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

*Intervention efficacy on trait-like emotions*

In our model, which included two measurement occasions of general positive emotions assessed with PERMA, a significant interaction effect occurred in the two-way interaction between group and time ($F$ [105,444] = 3843, $p$ =.03). Furthermore, the results indicated an increase in positive emotions (PERMA) within the intervention group between pre- and post-intervention ($p$ = .017, $d$ = 0.17). However, this model did not result in any between-group differences, nor did it result in any significant differences in general negative emotions measured with PERMA, nor in general positive or negative emotions as measured by PANAS, between pre- and post-intervention. Finally, no significant results occurred from the analysis of the general trait-like emotions measured with PERMA and PANAS on three measurement occasions (pre- and post-intervention, and 6 months follow-up).

## Discussion

The current study aimed to assess the long- and short-term efficacy of the Flourishing Schools intervention program intended to enhance the emotional well-being of basic education schoolteachers. The intervention led to an increase in positive emotions, as assessed by the PERMA positive emotion subscale, within the intervention group. This suggests an enhancement in emotional well-being, aligning with findings from prior PPI studies (Donaldson et al., 2019). The intervention did not result in increased trait-like positive emotions measured with PANAS. This result could be attributed to the distinct format of PANAS and the PERMA positive and negative emotion subscales, including variations in the number of items and scale ranges.

The intervention results showed an increase in the distinct emotions interest and engagement. These results are consistent with results from previous studies, which indicate that interest can improve general psychological well-being (Fredrickson, 2003) and further predict teacher well-being (Schiefele et al., 2013). PPIs executed in work environments have further improved employee engagement (Donaldson et al., 2019).

At the end of the intervention period, stress levels in the control group had increased; this increase supports the notion that schools without targeted programs supporting teachers' well-being put teachers at risk to the negative impact of stress (Skaalvik & Skaalvik, 2009).

Contrary to our expectations, negative emotions neither decreased within the intervention group nor differed between intervention and control groups after the intervention. The increase in positive emotions without a corresponding decrease in negative emotions supports the notion that the two constructs are relatively independent of each other (Fredrickson, 2001).

The results did not confirm our second hypothesis regarding the intervention's long-term effect on the teachers' emotions. The lack of sustained increase in positive emotions could be explained either by the intervention design insufficiently meeting the participants' needs, or by the diminishing effect, which often occurs within six months after an intervention (Weare & Nind, 2011). Further continuity and regular well-being screening using benchmarking procedures and booster sessions may achieve long-term efficacy (Roth et al., 2017). Besides being continuous, PPIs should be supported by the management and in policy documents.

McGrath et al. (2011) argue that sustained positive outcomes require the implementation of interventions in the entire school ecology.

Although the assessment of the teachers' momentary experienced distinct emotions in work situations showed no significant between-group post-intervention differences, the outcome revealed differences in stress and worry before the intervention. In comparison to the control group, the intervention group reported higher levels of stress while working, and higher levels of both stress and worry in the company of their colleagues. Although these pre-intervention differences are a concern, it is worth noting that the current study, contrary to our expectations, did not yield any significant between-group differences post-intervention. Nevertheless, the pre-intervention differences in stress and worry align with Folkman's (1997) theory, which suggests that notable negative emotional states can drive individuals to actively seek positive emotional states as a means of alleviation. As a result, it's possible that the intervention group was more motivated to decrease their stress levels at work compared to the control group.

After participating in the intervention program, the teachers reported decreased levels of stress and loneliness when in the company of their pupils. Stress and worry increased after the intervention in the control group when in the company of their colleagues. In comparison, levels of experienced stress while working and in the company of colleagues decreased within the intervention group. The pre-intervention assessments were carried out at the beginning of the school year and the post-intervention assessments at the end, which potentially influenced the outcome of these variables. However, the results support the notion that emotional well-being is affected by context (Folkman & Moskowitz, 2000).

### *Strengths and limitations*

This study contributes to the growing body of research that advocates for the development of the well-being of teachers and school personnel, along with the support for student well-being in the school environment (McGrath et al., 2011). This study is exploratory in the sense that few studies have assessed teachers' state-like emotions with ESM (Keller et al., 2014). ESM can enhance the ecological validity of assessments of momentary emotional experiences (Hektner et al., 2007) in terms of both the educational context (Zirkel et al., 2015; Keller et al., 2014) and the dynamic nature of emotions (Robinson & Clore, 2002).

## Conclusion

Supporting and enhancing teachers' well-being is important for encouraging and retaining teachers in the profession (Acton & Glasgow, 2015) and to increase students' well-being (Spilt et al., 2011). Consistent with previous PPI studies (Carr et al., 2020), the Flourishing Schools program was efficacious in enhancing emotional well-being and decreasing stress. However, achieving sustained improvement in emotional well-being in educational settings requires continuous efforts, and the prioritization and implementation of such efforts, on inter-individual, structural, and legislative levels (McGrath et al., 2011). This study indicates that the emotional well-being of both teachers and school personnel can be successfully enhanced in the school workplace, which could have consequent positive effects on student well-being (Spilt et al., 2011) and student

learning (Jennings & Greenberg, 2009). By increasing teachers' ability to handle challenging situations, PPIs such as the Flourishing Schools program may potentially contribute to help teachers feel engaged and motivated in their work and consequently encourage them to remain in their profession.

**Disclosure statement**

No potential conflict of interest was reported by the authors.

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