



Article

Effects of Individualised and General Self-Regulation Online Training on Teachers' Self-Regulation, Well-Being, and Stress

Kira Li Sanchez and Malte Schwinger * 

Department of Educational Psychology, Philipps University of Marburg, D-35037 Marburg, Germany

* Correspondence: malte.schwinger@uni-marburg.de

Abstract: Teachers face numerous demands in their daily work which can lead to stress and a decline in well-being. This is evidenced by research highlighting prevalent issues such as cognitive strain, exhaustion, and mental health concerns. While interventions exist to address these challenges, they are often time consuming and resource intensive. Therefore, our study aims to investigate the effects of a brief individualised versus general self-regulation online training on (pre-service) teachers' self-regulation competence, well-being, and stress levels. Self-regulation competence was assessed at three timepoints using the MSR-T. Trainee teachers and teachers were assigned to either individualised self-regulation training, general self-regulation training, or a waitlist control group. In addition to self-regulation competence, well-being was measured using the WHO-5 Well-Being Index, general stress was assessed using the Perceived Stress Scale (PSS-10) and occupational stress was measured using the Occupational Stress Scale. Mixed ANOVA and linear regression analyses demonstrated that self-regulation could be fostered through our individualised training and that (trainee) teachers with low baseline competencies, in particular, benefited from the training. Facets of self-regulation were identified as significant predictors of well-being and general as well as occupational stress.

Keywords: self-regulation (SR); teacher training; teaching competencies; self-regulation training (SRT); online training



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1. Introduction

To effectively perform as a teacher, various competencies and skills are required, including extensive subject knowledge, didactic expertise, organisational skills, frustration tolerance, and self-regulation ability [1–3]. Working as a teacher encompasses numerous tasks, such as lesson preparation, content delivery, communication with students and parents, problem solving, grading, and writing support plans [4,5]. However, teacher training curricula often prioritise subject knowledge and didactics, whereby skills such as stress-, classroom-, and self-management are often neglected due to increasing workloads. Especially, trainees who face numerous new tasks often feel overwhelmed in the early stages of their careers [6,7]. According to a German health insurance study of 1300 teachers, 16 percent believe that their health and resilience are insufficient to continue in the profession until legal retirement [8]. Almost half of them doubt being able to work that long. Teachers struggle most with cognitive strain; 45% have difficulty “switching off” and continue ruminating about work-related problems at home. Roughly a third report constant feelings of nervousness and increased irritability [8]. Lehr [9] notes that teachers often exhibit higher rates of exhaustion, irritability, and sleep disorders than other professions. Mental illnesses are the primary reasons for early retirement.

While external factors often lead to stress, internal factors such as self-efficacy expectations, ability to distance oneself [9], and self-regulation (SR) also contribute to stress development [10,11]. There are several projects for expanding health-promoting skills or interventions for reducing stress that have been effective in preventing mental disorders and early retirement [12–16]. However, these programmes often require time and planning or

target only very specific problems, as a systematic review of stress interventions reveals [17]. This may make it difficult for teachers to apply training alongside their daily workload. It would therefore be useful to consider how general skills that affect work performance, stress, and well-being can be developed in the most time-efficient way. One possibility is to make interventions shorter or to offer them at a distance, making it easier and more attractive to participate in training programmes. However, it is questionable which general skills have the greatest possible influence on stress and well-being and how short a training programme can be to have an impact.

To bridge this gap, our study aims to test whether a brief online intervention, teaching overarching competencies such as self-regulation (SR), can positively impact teachers' well-being and general and occupational stress. Given the increasing health risks associated with teaching [18–23], developing brief, accessible online training could help teachers maintain their health. This, in turn, could help them to perform their daily tasks more effectively, benefiting their students in the long run [21,22,24,25]. We focus on SR, a process by which we achieve personal goals by continuously influencing and adapting our thoughts, feelings, and actions [26] because SR influences well-being [27], mental health [28], chronic diseases [29], academic achievements [30,31], and professional success [24]. Several studies show substantial correlations between self-regulative coping strategies, emotional stress, and job satisfaction [23,32–34]. In line with these findings, the German Education Action Council recommends promoting SR skills to prevent and cope with school stress in all phases of teacher education [35]. It is also important to note that pupils benefit from teachers who are able to regulate their own behaviour effectively. Burgess [36] integrates the results of her study into the context of other literature and postulates that teachers should first improve their own SR in order to then be able to effectively promote SR in children. Other studies, such as the one by Akcaoglu and colleagues [25], which links SR skills with critical thinking and metacognition, also recommend that SR be taken into account when designing teacher training programmes. Günes [37] identifies a similar conclusion in her study of student teachers. She demonstrates that self-regulated learning does not undergo significant change over the four-year training period and recommends that these skills be given greater consideration in teacher training. For these reasons, it is our contention that it is both necessary and beneficial to examine the extent to which teachers can benefit from self-regulation training (SRT), as well as to analyse prospective teachers who are already engaged in the same work. As those just starting out in the profession are more susceptible to stress [6], a short and effective training programme would be particularly beneficial in paving the way for a healthy working life. However, please note that SR skills are labelled and operationalised quite differently in the literature, which further complicates the comparison of existing interventions and their effects [38,39].

Although SR is considered learnable and trainable [40], there is little training for teachers that is freely available, brief, and tailored to SR competencies. Moreover, existing training [41,42] often requires a lot of time and is not feasible in every setting. In other fields, such as professional reorientation, goal setting, action planning, self-observation, and self-motivation have proven beneficial for achieving professional goals. Schaarschmidt and Kieschke [41] and Mattern [42] developed SRT programmes for teachers and recorded positive effects on control strategies and stress coping. Their results suggest that short interventions can positively influence teachers' SR competencies and professional well-being and that teaching SR skills is relevant throughout teacher training. Given that teachers often face time constraints in their daily lives, shorter and more flexible approaches, such as online interventions, could be a feasible and cost-effective alternative [43]. This is because web-based interventions can be used anytime and anywhere, providing flexibility at the user's convenience. This is crucial when time is lacking or access to traditional interventions is limited. The ubiquity of smartphones and laptops facilitates the accessibility of these interventions and allows for easy implementation of web-based interventions [44]. However, it remains an open question how to efficiently promote SR skills and in which areas of life. For instance, teachers may exhibit excellent SR skills in the area of lesson

preparation but struggle with self-care and relaxation. In this context, tailoring the training to the individual SR profile could be beneficial, as individualisation has been shown to enhance training effects in other disciplines like teaching [45] but also in SR training for students where adapting SR instructions to a context was more beneficial [46].

In summary, our study addresses the following research questions:

- I. Is self-regulation more effectively promoted through individualised or general on-line training?
- II. Do newcomers or teachers with low self-regulation competencies benefit in particular from this training?
- III. Do high levels of self-regulation competencies reduce general and occupational stress, and enhance well-being among teachers?

2. Methods

This study received support from Pro Praxis, a project funded by the German Federal Ministry of Education and Research as part of “Quality Offensive Teacher Education” (QLB) to enhance teacher education in Germany. This study has been registered at https://aspredicted.org/NFR_LJM (accessed on 18 November 2022). Note that because of high dropout levels at measurement point 3 (47.44%), we decided to adapt our analyses in deviation to our registration, as we describe in more detail below.

2.1. Sample Recruitment

The survey was conducted using the online platform Soscisurvey (<https://www.soscisurvey.de>) (accessed on 20 November 2022). Data were collected between 2 December 2022 and 2 February 2024. There were no specific inclusion criteria, except that participants had to be teachers, trainee teachers, or student teachers. In Germany, trainee teachers perform the same duties as their qualified counterparts, with the exception of receiving support and guidance. Consequently, both groups were treated as equal entities, differing primarily in terms of professional experience and the extent of their work. In deviation from our registration, participants who did not attend all measurement points were included to minimise data attrition. As a result, the final dataset also includes participants who, for example, attended Sessions 1 and 3 but not Session 2. Recruitment was carried out through social media, letters to schools, and study seminars in various federal states, and the university’s internal student mailing list. Participants who accessed the study through our social media call were offered the chance to take part in a draw for a wellness weekend gift voucher as an incentive to participate.

2.2. Instruments

Demographic variables. We assessed the variables *age*, *sex (gender)*, *professional experience* as a (trainee) teacher (in years), and *type of school to be taught* through self-reports.

Self-regulation. The Marburg Self-Regulation Questionnaire for Teachers (MSR-T; [47]) was used to measure SR. The questionnaire with 27 items asks about planning, monitoring and reflection skills in four relevant domains—namely *teaching*, *motivation*, *self-care*, and *communication* on a five-point scale ranging from 1 (“(almost) never”) to 5 (“(almost) always”). In addition, the items reflect adaptive or maladaptive SR strategies. For each of the four domains, subscores for adaptive and maladaptive planning (“I can set meaningful interim goals”, “I don’t know exactly where to focus my attention to achieve my goals.”), monitoring (“I can focus my attention on aspects relevant to the task.”, “Instead of doing the necessary tasks, I do other things that can later be used to justify my possible failure.”), and reflecting (“My interim goals serve as a compass for my further actions.”, “In retrospect, I can tell why something worked well or not.”) were calculated. An overall score was calculated by summing the subscales of the four domains. Both the overall score and the subscale scores can be used to create a profile of an individual’s strengths and weaknesses.

The quality criteria of the scale have been reported to be satisfactory, with Cronbach's alpha values ranging from $\alpha = 0.91$ to 0.97 [47]. In our study, internal consistency was high (as in the validation study), ranging from $\alpha = 0.92$ to 0.97 (see Table 1).

Table 1. Mean, standard deviation, and reliability measures of the instruments used at Timepoint 1 ($N = 269$).

Item Characteristics	Questionnaire
$M = 3.43$ (0.54) $\alpha = 0.970$	MSR-T sum score of all areas
$M = 3.78$ (0.56) $\alpha = 0.918$	MSR-T sum score Teaching
$M = 3.12$ (0.68) $\alpha = 0.927$	MSR-T sum score Self-Care
$M = 3.59$ (0.56) $\alpha = 0.916$	MSR-T sum score Communication
$M = 3.26$ (0.70) $\alpha = 0.935$	MSR-T sum score Self-Motivation
$M = 29.77$ (6.18) $\alpha = 0.883$	Perceived Stress Scale (PSS)
$M = 39.61$ (9.29) $\alpha = 0.877$	Occupational Stress (BB)
$M = 16.16$ (4.91) $\alpha = 0.863$	Well-being (WHO5)

Note. M (SD) = mean (standard deviation), α = Cronbach's α .

Perceived Stress. General stress was examined using the 10-item version of the Perceived Stress Scale (PSS-10, German version [48]). PSS-10 can be used to measure 'the degree to which situations in one's life are appraised as stressful' (p. 387; [49]) and the 10 items ("In the last month, how often have you felt nervous and 'stressed'?") must be answered on a five-point scale, ranging from 1 ("never") to 5 ("very often"). A sum score is formed after inverting positively formulated items, with higher scores reflecting a high level of stress. The scale's test-retest reliability was reported to be satisfactory, with Cronbach's α ranging from 0.78 to 0.91 in different studies and $\alpha = 0.84$ in a German sample [48]. In our study, the internal consistency was good $\alpha = 0.88$.

Well-being. Using the WHO-5 [50], we assessed general well-being. Five items (e.g., "I have felt calm and relaxed.") must be answered on a six-point scale ranging from 1 ("at no time") to 6 ("all the time") and are summed up to a total score, with higher scores reflecting better well-being. In our study, the WHO-5 showed good internal consistency of $\alpha = 0.86$.

Occupational stress. To examine subjective feelings about work, the 15-item (e.g., "I have seriously considered quitting.") Occupational Stress Scale (BB) by Enzmann and Kleiber [51] was used. This scale can be divided into three content areas: *Excessive demands*, *sense of control*, and *job satisfaction*. A five-point Likert scale ranging from 0 ("does not apply") to 4 ("fully applies") was used. As recommended by the authors, we used the arithmetic mean of the responses to assess levels of occupational stress. Higher scores reflect a high level of occupational stress. Internal consistency of the BB was good in our study $\alpha = 0.87$.

2.3. Training Material

In accordance with the MSR-T and the underlying theoretical framework [47], short online exercises were designed for each of the MSR-T's process areas to be measured. They were based on existing exercises from the field of SRT and related constructs such as stress-management skills [14,46,52–54]. All learning modules started with a brief video that explained what skills were promoted in the respective exercise based on concrete examples

from everyday teaching practice. For instance, teachers could improve their planning skills by using methods such as SMART goals or the WHOOP method to cope with difficult tasks at work. The capacity for self-observation could be enhanced through exercises such as the body scan, reflecting on one's own stress markers, and creating a personal rating scale for the desired objective. The ability to reflect was fostered by addressing reflection questions, scrutinising one's own attribution styles, and generating ideas for adaptation based on experience. The training modules were completed online. At the end, participants were offered exercises as a PDF download and asked to implement them in their everyday work over the next few weeks. As different studies in other fields like student behaviour [2], sports [55] or nursing [56] point out, self-monitoring seems to be a crucial part of the SR process [55] because we must be able to identify current conditions in order to properly regulate thoughts, feelings and behaviour [57,58]. Therefore, exercises from the self-monitoring section of the individualised training were redesigned as daily recurring tasks for the generalised training. Participants were reminded by text message to engage in self-monitoring exercises for a period of two weeks. Sample tasks are provided in our Supplementary Materials.

2.4. Procedure

After obtaining informed consent, four questionnaires were presented to the participants. Subsequently, participants were randomly assigned to one of three experimental groups: Training Group 1 (TG1, individualised training), Training Group 2 (TG2, generalised training) and Waiting-Control Group (WCG). Participants in Experimental Groups 1 and 2 were able to start training immediately after the first measurement point. The control group could start the individualised training after the second measurement point. For an overview of the course of the study, see Figure 1.

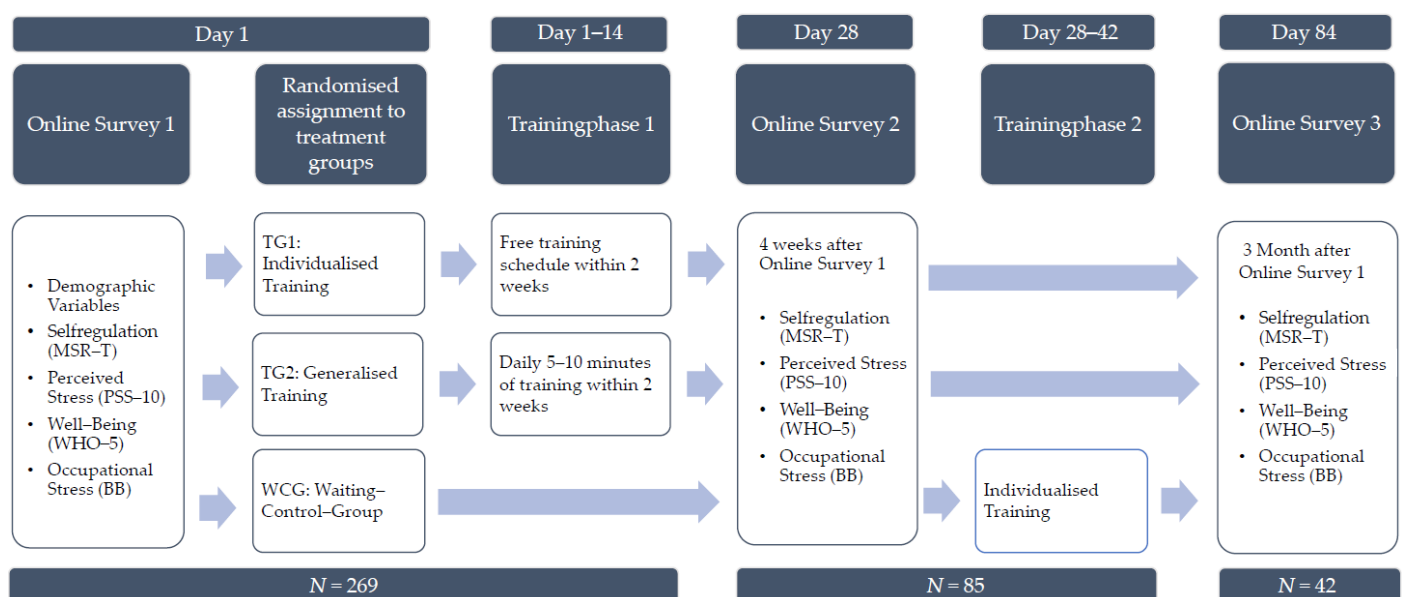


Figure 1. Overview of the course of study.

Participants in TG1 received individual feedback on their SR skills after completion of the initial questionnaires. The feedback was based on their MSR-T subscores *planning*, *self-monitoring*, and *self-reflection* in comparison to MSR-T subscores from a large sample of teachers [47]. Specific exercises were recommended if participants scored in the bottom 50% in certain areas. If participants were in the top 50% in all 3 areas, they were recommended an area in which they had individually performed the worst.

TG2 was not provided with personalised feedback on their SR skills. They were asked to complete the same self-observation training, regardless of their personal SR abilities.

The questionnaires were administered again at the second and third timepoints (respectively, four weeks and three months after the first timepoint). Lastly, we collected open-ended feedback about the training and the application.

If participants failed to participate at the second or third timepoint, they were sent an automated reminder email via Soscisurvey after one and two weeks.

2.5. Data Preparation and Statistical Analysis

The data were initially examined for potential outliers. Many participants only took part in the first measurement point. To prevent further data loss, we included data from participants who did not fully participate at all measurement points. However, participants were excluded from the respective analyses if no corresponding values were available. As a result, different sample sizes were used for different analyses. Prior to analysing the data, we checked for systematic dropout. Participants who dropped out after participating at baseline did not differ significantly from those who took part in multiple measurements in terms of *age*, *gender*, or *professional status* (teachers or trainee teachers). However, significant differences were found between the two groups in terms of *general well-being*, *perceived stress*, and *occupational stress*. Participants with a higher level of stress and poorer well-being were more likely to discontinue participation (see Tables A1 and A2, Appendix A).

To answer Research Question I, a 3 (Group: Training Group 1 vs. Training Group 2 vs. Waiting-Control group 3) $\times$ 2 (Time: Measurement 1 vs. Measurement 2) mixed ANOVA was conducted using data from $N = 78$ participants who declared to have fully participated the training ($N = 7$ participants were excluded from analyses, as they disclosed not to have participated the training). Research Questions II and III were addressed through linear and multiple regression analyses.

The scores of the MSR-T, WHO-5, PSS-10, and BB were normally distributed for all groups and measurement points, as confirmed by the Shapiro–Wilk test ($p > 0.05$). The box plots analysis revealed no outliers. Levene’s test indicated no significant differences in error variances among groups ($p > 0.05$), suggesting homogeneity. Box’s M-test revealed no significant differences in covariances ($p = 0.383$), indicating homogeneity of covariances.

To examine the impact of SR on general and occupational stress and well-being, 3 linear regression analyses were conducted using data from Timepoint 1 ($N = 269$). Additionally, three analyses were performed using data from Timepoints 1 and 2, using only data from the Waiting-Control Group ($N = 40$), as they did not receive any treatment that could enhance SR competencies. We checked the assumptions for regression analyses through collinearity diagnostics, the Shapiro–Wilk test, QQ plots, and residual plots. Cook’s distance did not identify any outliers (all values < 1), and the variance inflation factor also indicated no issues (all values < 10). According to the case-by-case diagnosis using standardised residuals, 5 participants were identified whose values were more than 3 standard deviations. These were excluded from the data set.

All analyses were conducted with SPSS Statistics Base (IBM, Version 27). Our data and syntax to reproduce the analyses are publicly available: <https://data.uni-marburg.de/handle/dataumr/277> (accessed on 20 November 2022).

3. Results

Sample characteristics. Table 2 presents the characteristics of the sample, which consisted of 234 women (86.99%, mean age = 40.36 years, $SD = 10.95$ years) and 35 men (13.01%, mean age = 41.41 years, $SD = 10.10$ years). The sample included 1.4% student teachers, 23.4% trainee teachers, and 75.2% teachers. Table A3 (Appendix B) presents the composite scores for self-regulation (MSR-T), well-being (WHO-5), occupational stress (BB), and perceived stress (PSS-10), categorised by occupation. In terms of SR skills, there are descriptive differences among students, trainee teachers, and teachers at baseline. As expected, competence levels were higher in higher training levels. While the domain of teaching exhibited the most advanced development, the domain of self-care exhibited the

most pronounced deficiencies across all groups. Moreover, trainee teachers experienced slightly elevated levels of stress compared to their more experienced counterparts.

Table 2. Sample characteristics.

	Timepoint 1 (N = 269)
Gender	
Male, N (%)	35 (13%)
Female, N (%)	234 (87%)
Diverse, N (%)	-
Age, M (SD)	40.52 (10.83)
Occupational Experience in Years, M (SD)	12.16 (9.81)
School	
Elementary School, N (%)	75 (27.9%)
Secondary School (Hauptschule), N (%)	9 (3.3%)
Intermediate School (Realschule), N (%)	14 (5.2%)
Comprehensive School (Gesamtschule and Oberschule), N (%)	48 (17.9%)
College (Gymnasium), N (%)	69 (25.7%)
Trade School, N (%)	21 (7.8%)
Special Education School, N (%)	52 (19.3%)
Other, N (%)	16 (5.9%)
Employment	
Teacher, N (%)	202 (75.2%)
Trainee teacher, N (%)	63 (23.4%)
Student, N (%)	4 (1.5%)

Note. N = sample size, M = mean, SD = standard deviation.

At Measurement Point 2, participants (N = 38) from TG1 and TG2 were asked to provide information regarding the completion of the training, the efficacy of the exercises in their daily lives, and the usefulness of the training. The results are presented in Figures 2–4.

The majority of participants from TG1 had fully implemented the training and 28.57% had partially implemented it. In contrast, in TG2, only 16.66% of participants stated that they had fully completed the training, with the majority having only partially completed it (12.5%) and 12.5% having largely not completed it.

On the descriptive level, implementation in everyday life was more successful in TG1 (57.14% rather good, 35.71% rather bad, and 7.14% bad) than in TG2 (8.33% good, 16.66% rather good, 62.5% rather bad, and 12.5% bad).

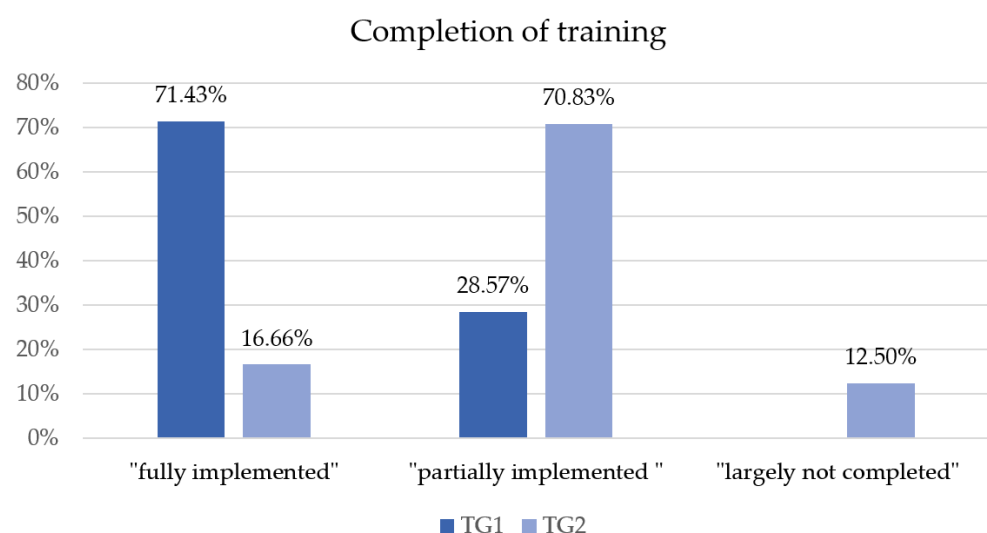


Figure 2. Subjective assessment of completion of training programme at Measurement Point 2 (N = 38, only TG1 and TG2).

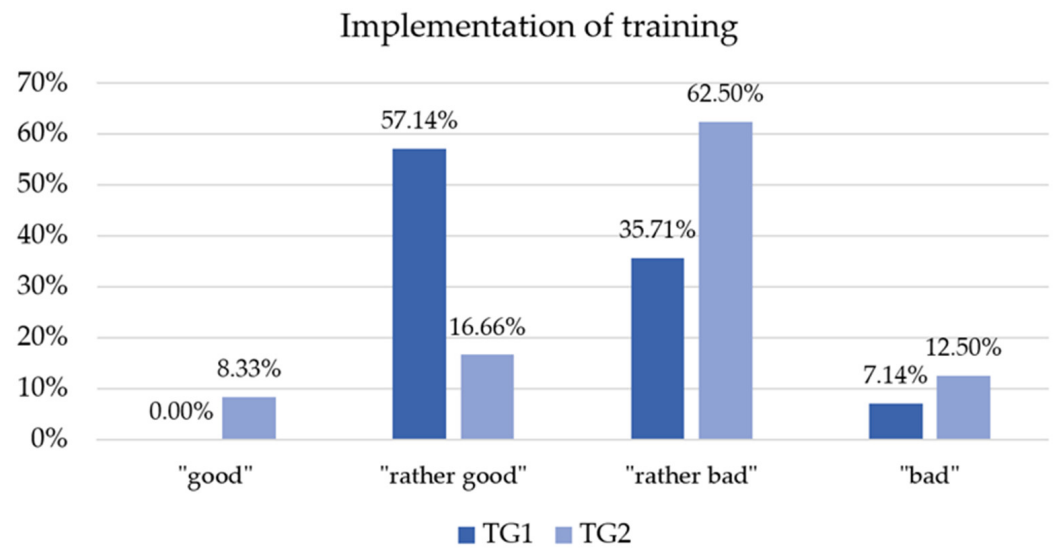


Figure 3. Subjective assessment of implementation in everyday life at Measurement Point 2 ($N = 38$, only TG1 and TG2).

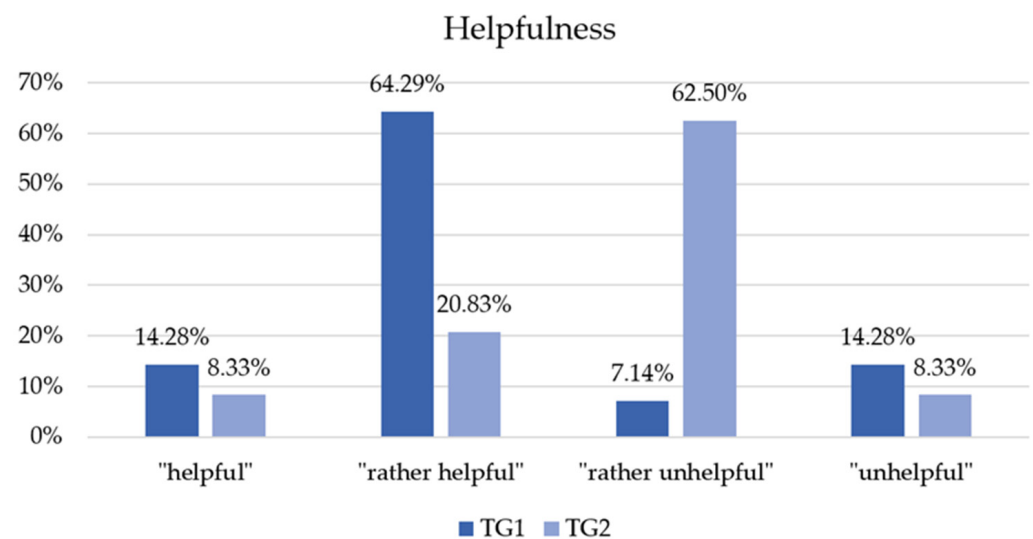


Figure 4. Subjective assessment of helpfulness at Measurement Point 2 ($N = 38$, only TG1 and TG2).

When queried on the helpfulness of the training, the majority of TG1 respondents indicated that they found the training "rather helpful" (64.29%) or "helpful" (14.28%), while 7.14% stated that they found the training "rather unhelpful" and 14.28% found it "unhelpful". In TG2, the assessment was reversed: here the majority found the training "rather unhelpful" (62.5%) or "unhelpful" (8.33%), while 20.83% found the training "rather helpful" and 8.33% "helpful".

The course has a relatively high dropout rate, resulting in different group sizes. Table 3 displays the number of participants as a function of the experimental group at each time-point. Table 4 provides correlations between all instruments and measurement points (MP). Self-regulation (measured by MSR-T) is moderately to strongly correlated with well-being (measured by WHO-5), general stress (measured by PSS-10), and occupational stress (measured by BB).

Table 3. Cross table with training conditions across the three measurement points.

		Participation at Measurement Points				Overall
		Only 1	1 and 2	1 and 3	1, 2 and 3	
Group	TG1	46	11	2	5	64
	TG2	73	14	1	15	103
	WCG	59	25	3	15	102
Overall		178	50	6	35	269

Note. TG1 = Training Group 1; TG2 = Training Group 2; WCG = Waiting-Control Group.

Table 4. Pearson Correlations of all instruments at all measurement points.

	(1) MSR-T MP1	(2) WHO-5 MP1	(3) PSS-10 MP1	(4) BB MP1	(5) MSR-T MP2	(6) WHO-5 MP2	(7) PSS-10 MP2	(8) BB MP2	(9) MSR-T MP3	(10) WHO-5 MP3	(11) PSS-10 MP3	(12) BB MP3
(2)	0.387 **	--										
N	269	269										
(3)	−0.486 **	−0.705 **	--									
N	269	269	269									
(4)	−0.543 **	−0.603 **	0.670 **	--								
N	269	269	269	269								
(5)	0.807 **	0.582 **	−0.565 **	−0.558 **	--							
N	81	81	81	81	81							
(6)	0.365 **	0.630 **	−0.560 **	−0.459 **	0.524 **	--						
N	84	84	84	84	81	84						
(7)	−0.568 **	−0.686 **	0.815 **	0.592 **	−0.686 **	−0.688 **	--					
N	84	84	84	84	81	84	84					
(8)	−0.578 **	−0.753 **	0.717 **	0.909 **	−0.652 **	−0.616 **	0.732 **	--				
N	84	84	84	84	81	84	84	84				
(9)	0.764 **	0.538 **	−0.606 **	−0.576 **	0.860 **	0.700 **	−0.775 **	−0.695 **	--			
N	39	39	39	39	32	32	32	32	39			
(10)	0.337 *	0.331 *	−0.346 *	−0.201	0.633 **	0.669 **	−0.674 **	−0.498 **	0.592 **	--		
N	43	43	43	43	36	36	36	36	39	43		
(11)	−0.491 **	−0.425 **	0.550 **	0.412 **	−0.561 **	−0.673 **	0.824 **	0.593 **	−0.699 **	−0.736 **	--	
N	43	43	43	43	36	36	36	36	39	43	43	
(12)	−0.581 **	−0.669 **	0.615 **	0.706 **	−0.661 **	−0.621 **	0.720 **	0.862 **	−0.706 **	−0.565 **	0.659 **	--
N	43	43	43	43	36	36	36	36	39	43	43	43

Note. MSR-T = Marburg Self-regulation Questionnaire for Teachers; WHO-5 = Questionnaire Well-being; PSS-10 = Questionnaire Perceived Stress; BB = Questionnaire Occupational Stress. MP = measurement point. * $p < 0.05$ (2-tailed), ** $p < 0.01$ (2-tailed).

Research question I. To address whether SR is more effectively promoted through individualised or general online training, we conducted a 3 (Group: TG1 vs. TG2 vs. WCG) $\times$ 2 (Time: MP1 vs. MP2) mixed ANOVA on the MSR-T mean score.

There was a statistically significant Group by Time interaction $F(2, 75) = 8.778, p < 0.001$, partial $\eta^2 = 0.190$. At the second measurement point, the MSR-T values differed significantly between groups ($p < 0.05$). Post hoc test indicated that TG1 did not differ significantly from TG2 (15.06, $p = 0.764$) or WCG (45.35, $p = 0.068$) after training. The difference between TG1 and WCG was borderline significant, possibly due to sample size or difference in group size. There was a statistically significant effect of Time in TG 1 $F(1, 14) = 19.924, p = 0.001$, partial $\eta^2 = 0.587$.

This means that the individualised training led to higher levels of SR while the generalised training did not improve SR. Figure 5 shows the differences in self-regulation (MSR-T) for the three groups over time.

Research question II. To address whether newcomers or teachers with low SR competencies benefit in particular from this training two linear regression analyses were conducted. To ensure whether work experience predicts SR at all, first a linear regression analysis with *self-regulation* (MSR-T score at Timepoint 1) as the dependent variable and *work experience in years* as the predictor. The regression analysis is significant ($F(1, 264) = 8.05, p = 0.005$). The coefficient of determination R^2 for the overall model is 0.03 (corrected $R^2 = 0.026$) and according to Cohen [30] corresponds to a small goodness of fit. *Work experience* is a significant predictor of *self-regulation* ($\beta = 0.172; t(263) = 2.837; p = 0.005$). Please refer to Appendix C Table A4 for further details. This implies that those at the outset of their careers, in particular, exhibit lower

levels of competence, which improve with increasing professional experience. Figure 6 shows slight descriptive differences between the two groups.

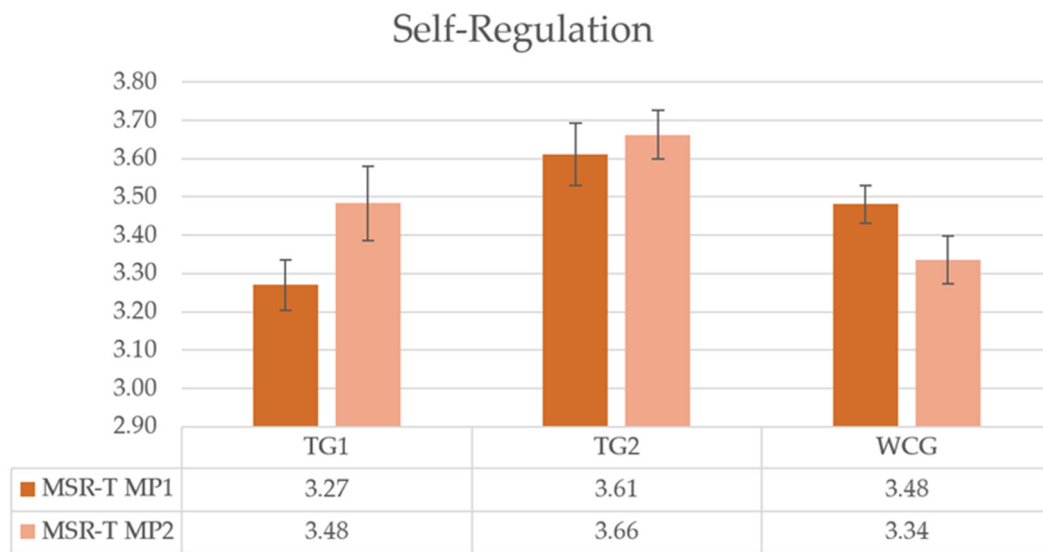


Figure 5. Self-regulation scores (MSR-T) at Measurement Points 1 and 2 ($N = 85$). Note. MP = measurement point. TG1 = Training Group 1; TG2 = Training Group 2; WCG = Waiting-Control Group. Scale of MSR-T ranges from 1 to 5; higher values indicate more SR. Error bar = $\pm$ SEM.

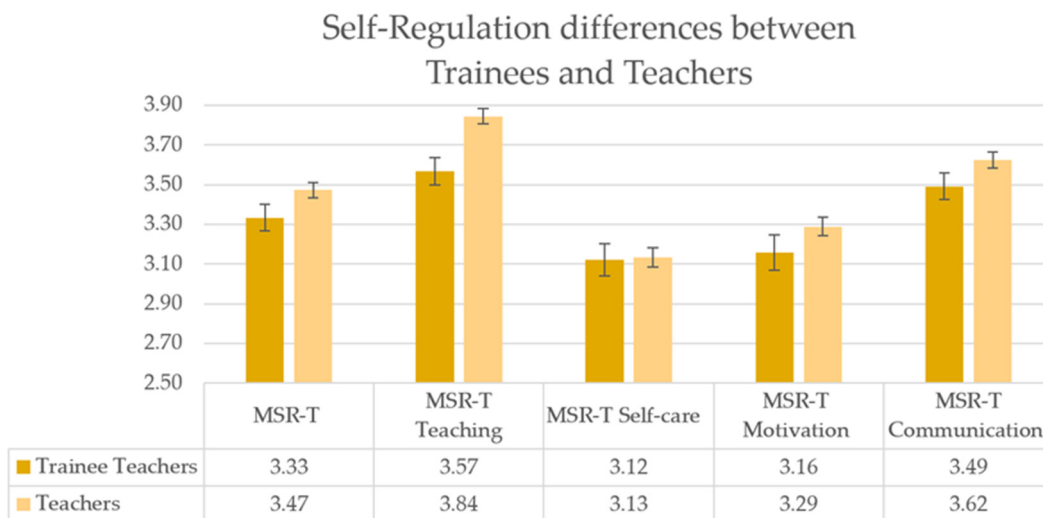


Figure 6. Self-regulation differences (MSR-T) between trainee teachers and teachers at MP1 ($N = 269$). Note. Trainee teachers were defined as those engaged in the process of becoming teachers, including student teachers ($N = 4$). Scale of MSR-T ranges from 1 to 5. Error bars = $\pm$ SEM.

Secondly, it should be noted that not all teachers with low SR skills are trainee teachers. Therefore, a linear regression analysis was performed using *training gain* (change-score of SR between Timepoint 1 and Timepoint 2) as the dependent variable and the *MSR-T score at timepoint 1* as the predictor and is significant ($F(1, 41) = 4.897$ $p = 0.033$). The coefficient of determination R^2 for the overall model is 0.107 (corrected $R^2 = 0.085$) and according to Cohen [30] corresponds to a small goodness of fit. *Self-regulation at MP1 is a significant predictor of training gain* ($\beta = -0.327$; $t(39) = -2.213$; $p = 0.033$), indicating that training was more successful for teachers with a lower self-regulation score. Please refer to Appendix C Table A5 for further details.

Research question III. To review previous findings suggesting that high levels of SR competencies reduce general and occupational stress and enhance well-being among

teachers, the connection between these constructs was examined with several multiple regression analyses with data from MP1 as well as longitudinal data from MP1 and 2.

The multiple linear regression with *well-being at MP1* as the dependent variable and the four *self-regulation subscores* as predictors was significant ($F(4, 264) = 13.877$ $p < 0.001$). The coefficient of determination R^2 for the overall model was 0.174 (corrected $R^2 = 0.161$) and according to Cohen [30] corresponds to a medium goodness of fit. *MSR-T subscore self-care* was MP1 is a significant predictor of *well-being* ($\beta = 0.266$; $t(262) = 3.11$; $p = 0.002$). *MSR-T subscores teaching, self-motivation, and communication* do not significantly influence *well-being* (see Appendix C: Table A6).

The multiple regression with *occupational stress at MP1* as the dependent variable and the four *self-regulation subscores* as predictors is significant ($F(4, 264) = 29.847$ $p < 0.001$). The coefficient of determination R^2 for the overall model is 0.311 (corrected $R^2 = 0.301$) and according to Cohen [30] corresponds to a high goodness of fit. *MSR-T subscores self-care and teaching at MP1* are significant predictors of *occupational stress* (self-care: $\beta = -0.252$; $t(262) = -3.231$; $p = 0.001$; teaching: $\beta = -0.229$; $t(262) = -2.632$; $p = 0.009$). *MSR-T subscores self-motivation and communication* do not significantly influence *occupational stress* (see Appendix C: Table A7).

The multiple regression with *perceived stress at MP1* as the dependent variable and the four *self-regulation subscores* as predictors is significant ($F(4, 264) = 21.885$ $p < 0.001$). The coefficient of determination R^2 for the overall model is 0.249 (corrected $R^2 = 0.238$) and according to Cohen [30] corresponds to a medium goodness of fit. *MSR-T subscore self-care at MP1* is a significant predictor of *perceived stress* ($\beta = -0.259$; $t(262) = -3.184$; $p = 0.002$). While *MSR-T subscores teaching, self-motivation and communication* do not significantly influence *perceived stress* (see Appendix C: Table A8).

In summary, it can be said that individual subscores of SR measured via MSR-T-more precisely self-care and teaching- predict stress and well-being, measured with PSS-10, BB, and WHO-5 at MP1.

As the majority of our participants received SRT, we were only able to include 40 participants from the waiting control group in the longitudinal analysis to confirm the results mentioned above.

The multiple regression with *well-being at MP2* as the dependent variable and the four *self-regulation subscores and well-being at MP1* as predictors is significant ($F(5, 34) = 5.148$ $p = 0.001$). The coefficient of determination R^2 for the overall model is 0.431 (corrected $R^2 = 0.347$) and according to Cohen [30] corresponds to a high goodness of fit. *MSR-T subscore communication at MP1* is a significant predictor of *well-being* ($\beta = -0.601$; $t(34) = -2.050$; $p = 0.048$). *MSR-T subscores teaching, self-motivation, and motivation, as well as well-being at MP1* do not significantly influence *well-being at MP2* (see Appendix C: Table A9).

The multiple regression with *occupational stress at MP2* as the dependent variable and the four *self-regulation subscores and occupational stress at MP1* as predictors is significant ($F(5, 34) = 74.685$ $p < 0.001$). The coefficient of determination R^2 for the overall model is 0.917 (corrected $R^2 = 0.904$) and according to Cohen [30] corresponds to a high goodness of fit. *MSR-T subscores self-care, teaching and communication at MP2 as well as occupational stress at MP1* are significant predictors of *occupational stress at MP2* (self-care: $\beta = -0.252$; $t(34) = -3.231$; $p = 0.001$; teaching: $\beta = -0.229$; $t(34) = -2.632$; $p = 0.009$; communication: $\beta = 0.312$; $t(34) = 3.456$; $p = 0.001$; BB MP1: $\beta = 0.789$; $t(34) = 11.302$; $p < 0.001$). *MSR-T subscore self-motivation* does not significantly influence *occupational stress* (see Appendix C Table A10). The multiple regression with *perceived stress at MP2* as the dependent variable and the four *self-regulation subscores and perceived stress at MP1* as predictors is significant ($F(5, 34) = 32.390$, $p < 0.001$). The coefficient of determination R^2 for the overall model is 0.826 (corrected $R^2 = 0.801$) and according to Cohen [30] corresponds to a high goodness of fit. *MSR-T subscores self-care and communication, as well as perceived stress at MP1* are significant predictors of *perceived stress* (self-care: $\beta = -0.482$; $t(34) = -4.002$; $p = 0.001$; communication: $\beta = 0.305$; $t(34) = 2.338$; $p = 0.025$; PSS-10 MP1: $\beta = 0.678$; $t(34) = -7.584$;

$p < 0.001$). MSR-T subscores teaching, and self-motivation do not significantly influence *perceived stress* (see Appendix C: Table A11).

In summary, different SR subscores at MP1, more precisely self-care and teaching, predict general and occupational stress, as well as well-being at MP2, indicating, that training SR can help to improve health. However, the communication subscale also proved to be a significant predictor, whereby it is particularly striking that the regression coefficient is positive and thus indicates that all three stress and well-being measures for MP2 are better the less SR was reported in the area of communication for MP1.

4. Discussion

Self-regulation is a crucial skill, particularly in complex professions such as teaching. It is associated with not only professional success but also stress management and well-being [22,27,59]. Our study aimed to explore how online training can promote SR in teachers over a relatively short period of time. Additionally, we aimed to investigate whether such training needs to be tailored to teachers' individual competence levels or whether more general approaches that focus on promoting self-monitoring can increase the overall use of SR strategies. The study employed the MSR-T [47] to assess the use of SR strategies (planning, monitoring, reflecting) in four relevant domains of SR, including teaching and self-care. This approach enabled the investigation of individual strength and weakness profiles, from which concrete training recommendations can be derived.

Our findings suggest that SR skills can be enhanced through brief, individualised online training. In contrast, our generalised training did not lead to a significant increase in SR skills. The waiting control group's SR remained stable between Measurement Points 1 and 2, suggesting stability of the characteristic over time. The results must be interpreted with caution in light of the relatively high dropout rate, as described in Section 4.3.

Cross-sectional analyses demonstrated that SR was positively associated with the level of professional experience. Novice teachers in particular exhibited a lower level of SR than their more experienced colleagues. The fact that the increase in competence (subtraction of MSR-T score MP2-MP1) was predicted by the MSR-T score at MP1 suggests that teachers with a lower level of SR skill benefited particularly from the individualised training.

Several regression analyses were conducted to investigate the relationship between SR and stress and well-being, which has already been reported in other studies [59,60]. In our cross-sectional analyses, we also found that different aspects of SR predicted stress experience and well-being as measured by PSS-10, occupational stress scale and WHO-5. For instance, the SR subscore for self-care was found to be a significant predictor of stress experience (PSS-10) and well-being (WHO-5). Furthermore, the SR score for teaching was also a significant predictor of occupational stress (BB). It can be concluded that promoting SR strategies for teachers in the area of self-care can have a positive impact on their health. However, SR scores in the area of teaching or self-motivation are less significant.

The findings of the cross-sectional examination were confirmed in the longitudinal analyses. Different subscores of the MSR-T at MP1 were significant predictors of stress experience and well-being at MP2 four weeks later. In this instance, the outcomes may also be affected by the varying sample sizes employed. In the cross-sectional study, all participants from Measurement Point 1 could be included, while the longitudinal study was affected by the dropout. However, the slightly different results may also be explained by the choice of measurement instruments, as explained further in Sections 4.1 and 4.3.

4.1. Promotion of Self-Regulation Skills

Contrary to our assumption, SR could only be promoted by individualised training and not by generalised training in the present. Besides the comparatively small sample size, possible reasons for this finding may lie in the significantly lower training adherence in TG2 compared to TG1. Some participants reported that the exercises from TG2 were too time-consuming for implementation in everyday life. It is possible that the daily exercises had put the participants under additional pressure, thereby undermining their beneficial

effects. They further criticised that more concrete examples should have been given for implementation in everyday life.

It is also conceivable that the exercises in the generalised training were simply not suitable for promoting SR as a whole. When examining the average scores in the area of *teaching*, it is clear that when comparing the three process areas of *planning*, *monitoring*, and *reflection*, *monitoring* is the most successful. This, in turn, has possibly led to less progress, especially if it was not possible to derive helpful conclusions from the observation. Furthermore, the individualised feedback given in TG1 could have contributed to improving the applicability by specifying the context (*teaching*, *self-care*, *self-motivation*, or *communication*) where SR could be extended. Further research should, therefore, investigate the impact of feedback on the strengths and weaknesses of the promotion of SR skills.

However, individualisation and corresponding feedback for training have the advantage of being more resource saving than non-individualised training, in which all modules have to be completed.

4.2. Influence on General Stress Level, Occupational Stress, and Well-Being

Various facets of SR influence well-being, general stress experience, and occupational stress. However, only some facets are significant predictors in both cross-sectional and longitudinal studies. Further research is needed to determine which facets are relevant. The cross-sectional study highlights the importance of self-care, while the longitudinal study identifies communication, besides self-care, as a significant predictor. The differences may be due to the fact that the use of SR strategies has a direct impact on our well-being when we successfully complete tasks or take good care of ourselves. However, it is unlikely that SR in the area of self-care at MP1 four weeks later at MP2 has a long-term influence on well-being. Rather, the level of SR shown shortly before will have an influence on well-being. Further, there is a possibility that the communication subscale also captures how often challenging conversations are conducted. This could occur more frequently, for example, with teachers who have class leadership than with teachers without class leadership. As a result, it might not be the frequency with which regulation in the communication area is regulated, but the absence of regulation because fewer situations arise in which SR is necessary that may influence well-being and stress to MP2. However, it could also be that the three measures used, WHO-5, BB and PSS-10, are simply too volatile, i.e., fluctuating too much over a 4-week period, to be able to deliver meaningful results here.

4.3. Limitations and Future Directions

Working teachers represent a specific target group that is exposed to high demands and strong time pressure due to their profession. Recruiting for a long-term study proved to be difficult, as particularly stressed teachers who could benefit from training are often deterred by the questionnaires and the general effort of the study. Upon analysis of the dropouts, no differences in SR skills were observed. However, the participants who discontinued participation in the study exhibited higher stress levels. The effects of the study could possibly be even more pronounced if participants with higher stress exposure had continued to participate. Another issue was that a significant proportion of the participant reminder emails were incorrectly classified as spam and, therefore, not received in a timely manner. Despite our explicit instructions to check this folder, this occurred. Not all subjects participated carefully in the training, which could distort the results. Also, self-assessment regarding the implementation of the training could be faulty due to social desirability. For future studies, control measures such as brief questions about training content should be considered, which can also be helpful in developing the strategies. Overall, the study should be repeated with a larger sample to specifically investigate the influence of SR strategies on stress experience and well-being in the long term. Furthermore, it would be beneficial to collect data on professional success and teaching quality in order to ascertain the role of SR in teaching. In addition, the seasonal increase in stress, for example in the phases before the holidays or the determination of grades, could be considered.

It is also important to note that the representativeness of our sample is limited. This is due to the relatively small number of participants, as well as the gender ratio and the geographical distribution of the participants. Although we explicitly wrote to schools in most of the federal states for recruitment purposes, there was no way of checking how balanced the composition of our sample was. Nevertheless, it should be noted that we were able to recruit working teachers for a time-intensive study. In addition, we were able to recruit not only novice teachers but also teachers with a great deal of professional experience ($M = 12.16$ (9.81)) as participants.

As previously stated, further research is required to elucidate the precise mechanisms underlying the impact of individual facets of SR on feelings of stress and well-being. Long-term studies may employ either less volatile measurement instruments to record stress and well-being or a high-frequency combined measurement of SR strategy use and current state, as it is operationalised in EMA studies (Ecological Momentary Assessment). In future, it will be beneficial to include enquiries pertaining to the frequency of stressors or challenging conversations. It would also be advisable to control for this in order to obtain more accurate results. This study should therefore be repeated with a larger sample and the above-mentioned improvements to confirm the results.

Nevertheless, the results of our study indicate that the promotion of teachers' health should also include the fostering of SR, as the influence on indicators of mental health (stress, well-being) has been proven. According to our results, individualised training based on strengths and weaknesses seems to be particularly helpful in this regard.

4.4. Conclusions

The findings are consistent with previous research, identifying SR as a significant and teachable concept [56]. Online training that is short and adaptable can be used to encourage SR in teachers in a time-efficient manner. SR skills in the area of self-care are particularly important for managing stress levels and promoting well-being. The area of self-care is particularly pertinent, given that teachers are frequently exposed to high levels of stress. Nevertheless, the results of the SR questionnaire indicate that self-care is the least pronounced of the four areas we measured with MSR-T. In order to ensure the long-term health of teachers, it is therefore prudent to enhance the regulation of self-care in everyday professional practice as part of the development of professional competencies.

Based on our results, we recommend online training sessions, which allow participants to engage with the material independently and learn at their own pace. To ensure effectiveness, it is helpful to tailor the training to the individual competencies of each participant. To ensure relevance and direct applicability to participants' roles, it is important to adapt training sessions to individual competencies and provide practical examples that help participants understand how to apply the concepts in real-world scenarios. When designing the training programme, it is important to ensure that sufficient support is provided for transferability to everyday life, in line with the feedback from participants. It is recommended that novice teachers and those with low SR skills participate in SRT, as they stand to gain the most from it.

The capacity to self-regulate not only enhances teachers' ability to navigate the challenges of the educational environment but also fosters continuous personal and professional growth. The cultivation of SR skills enables teachers to more effectively reflect on their practices, set and achieve personal goals, and adapt to the evolving demands of their profession. This dynamic interplay between SR and professional identity development emphasises the necessity of targeted training programmes that facilitate the development of reflective practitioners and resilient professionals.

Nevertheless, further studies should aim to clarify the sustainability of the effects of SRT and its impact on teaching and the professional success of teachers.

Supplementary Materials: The following supporting information can be downloaded at <https://www.mdpi.com/xxx/s1>; <https://data.uni-marburg.de/handle/dataumr/277>, Example task of SRT Modules; SRT Material in German.

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Data Availability Statement: The original data presented in the study are openly available: <https://data.uni-marburg.de/handle/dataumr/277> (accessed on 20 November 2022).

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Appendix A

Table A1. Baseline differences at Timepoint 1.

	Dropout Yes(1)/No(0)	N	M	SD	SE
Sex	0	91	1.10	0.30	0.03
	1	178	1.15	0.35	0.03
Age	0	91	41.43	10.51	1.10
	1	178	40.04	11.00	0.82
WHO-5 MP1	0	91	17.15	4.96	0.52
	1	178	15.66	4.81	0.36
PSS-10 MP1	0	91	28.63	6.51	0.68
	1	178	30.35	5.93	0.44
BB MP1	0	91	37.67	9.65	1.01
	1	178	40.61	8.97	0.67
MSR-T MP1	0	91	374.73	62.78	6.58
	1	178	369.54	56.18	4.21
Trainee or teacher	0	91	0.81	0.39	0.04
	1	178	0.72	0.45	0.03

Note. *M* = mean; *SD* = standard deviation, *SE* = standard error of the mean; MSR-T = Marburg Self-regulation Questionnaire for Teachers; WHO-5 = Questionnaire Well-being; PSS-10 = Questionnaire Perceived Stress; BB = Questionnaire Occupational Stress.

Table A2. T-test for equality of means using independent samples.

		Levene-Test Equality of Variance		T-Test for Equality of Means						
		F	Sig.	T	df	Sig. (2-Sided)	Mean Difference	SE	95% Confidence Interval for the Difference	
									Lower Value	Upper Value
Sex	Variances are equal	4.990	0.026	−1.086	267	0.278	−0.047	0.043	−0.133	0.038
	Variances are not equal			−1.146	209.682	0.253	−0.047	0.041	−0.128	0.034

Table A2. Cont.

		Levene-Test Equality of Variance		T-Test for Equality of Means						
		F	Sig.	T	df	Sig. (2-Sided)	Mean Difference	SE	95% Confidence Interval for the Difference	
									Lower Value	Upper Value
Age	Variances are equal	0.742	0.390	0.991	267	0.323	1.384	1.396	−1.365	4.133
	Variances are not equal			1.006	188.953	0.316	1.384	1.376	−1.330	4.097
WHO-5 MP1	Variances are equal	0.022	0.882	2.388	267	0.018	1.49654	0.62667	0.26270	2.73039
	Variances are not equal			2.365	176.802	0.019	1.49654	0.63267	0.24799	2.74509
PSS-10 MP1	Variances are equal	0.434	0.511	−2.186	267	0.030	−1.72756	0.79039	−3.28375	−0.17136
	Variances are not equal			−2.121	167.340	0.035	−1.72756	0.81447	−3.33553	−0.11959
BB MP1	Variances are equal	0.455	0.501	−2.480	267	0.014	−2.94203	1.18620	−5.27753	−0.60653
	Variances are not equal			−2.422	170.226	0.016	−2.94203	1.21453	−5.33951	−0.54455
MSR-T MP1	Variances are equal	2.751	0.098	0.688	267	0.492	5.18595	7.53697	−9.65350	20.02540
	Variances are not equal			0.664	164.725	0.508	5.18595	7.81291	−10.24041	20.61231
Trainee or teacher	Variances are equal	13.084	0.000	1.691	267	0.092	0.09409	0.05564	−0.01547	0.20364
	Variances are not equal			1.769	205.154	0.078	0.09409	0.05319	−0.01078	0.19895

Note. Sig. = significance; df = degrees of freedom; SE = standard error of the mean; MSR-T = Marburg Self-regulation Questionnaire for Teachers; WHO-5 = Questionnaire Well-being; PSS-10 = Questionnaire Perceived Stress; BB = Questionnaire Occupational Stress.

Appendix B

Table A3. Sample characteristics of self-regulation, well-being, general stress, and occupational stress at Timepoint 1.

	Students and Trainee Teachers	Teachers
	(N = 67)	(N = 202)
MSR-T sum score of all areas, <i>M</i> (<i>SD</i>)	360.04 (60.32)	375.02 (57.45)
MSR-T sum score Teaching, <i>M</i> (<i>SD</i>)	96.27 (15.22)	103.80 (14.53)
MSR-T sum score Self-care, <i>M</i> (<i>SD</i>)	84.25 (18.25)	84.56 (18.45)
MSR-T sum score Communication, <i>M</i> (<i>SD</i>)	94.25 (14.75)	97.87 (15.35)
MSR-T sum score Self-motivation, <i>M</i> (<i>SD</i>)	85.27 (19.84)	88.79 (18.38)
Perceived Stress Scale (PSS), <i>M</i> (<i>SD</i>)	31.62 (6.33)	29.15 (6.02)
Occupational Stress (BB), <i>M</i> (<i>SD</i>)	40.97 (10.22)	39.17 (8.94)
Wellbeing (WHO5)	16.08 (5.50)	16.18 (4.70)

Note. MSR-T = Marburg Self-regulation Questionnaire for Teachers; *M* = mean; *SD* = standard deviation.

Appendix C

Table A4. Model Coefficients of Regression Analyses.

Dependent Variable	Predictor	Regression Coefficient	Standard Error	Beta	t	p	95% Confidence Interval	
							Lower	Upper
MSR-T MP1	Intercept	358.512	5.661		63.329	0.000	347.365	369.658
	Professional Experience (in years)	1.029	0.363	0.172	2.837	0.005	0.315	1.743

Note. MSR-T = Marburg Self-regulation Questionnaire for Teachers; MP1 = Measurement Point 1.

Table A5. Model Coefficients of Regression Analyses.

Dependent Variable	Predictor	Regression Coefficient	Standard Error	Beta	t	p	95% Confidence Interval Lower	Upper
Training Gain (MSR-T MP2-MSR-T MP1)	Intercept	98.175	36.249		2.708	0.010	24.970	171.380
	MSR-T MP1	−0.208	0.094	−0.327	−2.213	0.033	−0.399	−0.018

Note. MSR-T = Marburg Self-regulation Questionnaire for Teachers; MP1 = Measurement Point 1, MP2 = Measurement Point 2.

Table A6. Model Coefficients of Regression Analyses.

Dependent Variable	Predictor	Regression Coefficient	Standard Error	Beta	t	p	95% Confidence Interval Lower	Upper
WHO-5 at MP1	Intercept	5.558	2.050		2.711	0.007	1.521	9.594
	MSR-T S1	0.071	0.023	0.266	3.114	0.002	0.026	0.116
	MSR-T U1	0.040	0.031	0.122	1.281	0.201	−0.021	0.101
	MSR-T K1	−0.030	0.028	−0.094	−1.079	0.282	−0.085	0.025
	MSR-T M1	0.039	0.028	0.151	1.385	0.167	−0.017	0.096

Note. WHO-5 at MP1 = Well-being Index at Measurement Point 1, MSR-T S1 = MSR-T subscore self-care at Measurement Point 1, MSR-T U1 = MSR-T subscore teaching at Measurement Point 1, MSR-T K1 = MSR-T subscore communication at Measurement Point 1, MSR-T M1 = MSR-T subscore self-motivation at Measurement Point 1.

Table A7. Model Coefficients of Regression Analyses.

Dependent Variable	Predictor	Regression Coefficient	Standard Error	Beta	t	p	95% Confidence Interval Lower	Upper
BB at MP1	Intercept	70.306	3.545		19.830	0.000	63.325	77.287
	MSR-T S1	−0.127	0.039	−0.252	−3.231	0.001	−0.205	−0.050
	MSR-T U1	−0.142	0.054	−0.229	−2.632	0.009	−0.247	−0.036
	MSR-T K1	0.031	0.048	0.051	0.639	0.523	−0.064	0.126
	MSR-T M1	−0.097	0.049	−0.195	−1.961	0.051	−0.194	0.000

Note. BB at MP1 = occupational stress scale at Measurement Point 1, MSR-T S1 = MSR-T subscore self-care at Measurement Point 1, MSR-T U1 = MSR-T subscore teaching at Measurement Point 1, MSR-T K1 = MSR-T subscore communication at Measurement Point 1, MSR-T M1 = MSR-T subscore self-motivation at Measurement Point 1.

Table A8. Model Coefficients of Regression Analyses.

Dependent Variable	Predictor	Regression Coefficient	Standard Error	Beta	t	p	95% Confidence Interval Lower	Upper
PSS-10 at MP1	Intercept	47.314	2.461		19.226	0.000	42.469	52.159
	MSR-T S1	−0.087	0.027	−0.259	−3.184	0.002	−0.141	−0.033
	MSR-T U1	−0.046	0.037	−0.111	−1.224	0.222	−0.119	0.028
	MSR-T K1	−0.002	0.033	−0.004	−0.051	0.960	−0.068	0.064
	MSR-T M1	−0.061	0.034	−0.185	−1.783	0.076	−0.128	0.006

Note. PSS-10 at MP1 = Perceives Stress Scale at Measurement point 1, MSR-T S1 = MSR-T subscore self-care at Measurement Point 1, MSR-T U1 = MSR-T Subscore teaching at Measurement Point 1, MSR-T K1 = MSR-T Subscore communication at Measurement Point 1, MSR-T M1 = MSR-T subscore self-motivation at Measurement Point 1.

Table A9. Model Coefficients of Regression Analyses.

Dependent Variable	Predictor	Regression Coefficient	Standard Error	Beta	t	p	95% Confidence Interval Lower	Upper
WHO-5 at MP2	Intercept	7.760	5.023		1.545	0.132	−2.448	17.967
	WHO-5 MP1	0.369	0.220	0.346	1.673	0.103	−0.079	0.816
	MSR-T S1	0.076	0.058	0.291	1.319	0.196	−0.041	0.193
	MSR-T U1	0.140	0.090	0.431	1.545	0.132	−0.044	0.323
	MSR-T K1	−0.159	0.078	−0.601	−2.050	0.048	−0.317	−0.001
	MSR-T M1	−0.022	0.082	−0.089	−0.271	0.788	−0.188	0.144

Note. WHO-5 = Well-being Index, MP1 = Measurement Point 1, MP2 = Measurement Point 2, MSR-T S1 = MSR-T subscore self-care at Measurement Point 1, MSR-T U1 = MSR-T subscore teaching at Measurement Point 1, MSR-T K1 = MSR-T subscore communication at Measurement Point 1, MSR-T M1 = MSR-T subscore self-motivation at Measurement Point 1.

Table A10. Model Coefficients of Regression Analyses.

Dependent Variable	Predictor	Regression Coefficient	Standard Error	Beta	t	p	95% Confidence Interval Lower	95% Confidence Interval Upper
BB at MP2	Intercept	18.323	6.096		3.006	0.005	5.934	30.713
	BB at MP1	0.835	0.074	0.789	11.302	0.000	0.685	0.985
	MSR-T S1	−0.127	0.048	−0.230	−2.637	0.013	−0.225	−0.029
	MSR-T U1	−0.191	0.069	−0.279	−2.746	0.010	−0.332	−0.050
	MSR-T K1	0.175	0.051	0.312	3.456	0.001	0.072	0.277
	MSR-T M1	0.028	0.064	0.054	0.441	0.662	−0.101	0.158

Note. BB = occupational stress scale, MP1 = Measurement Point 1, MP2 = Measurement Point 2, MSR-T S1 = MSR-T subscore self-care at Measurement Point 1, MSR-T U1 = MSR-T subscore teaching at Measurement Point 1, MSR-T K1 = MSR-T subscore communication at Measurement Point 1, MSR-T M1 = MSR-T subscore self-motivation at Measurement Point 1.

Table A11. Model Coefficients of Regression Analyses.

Dependent Variable	Predictor	Regression Coefficient	Standard Error	Beta	t	p	95% Confidence Interval Lower	95% Confidence Interval Upper
PSS-10 at MP2	Intercept	16.888	5.204		3.245	0.003	6.311	27.465
	PSS-10 at MP1	0.689	0.091	0.678	7.584	0.000	0.504	0.873
	MSR-T S1	−0.163	0.041	−0.482	−4.002	0.000	−0.246	−0.080
	MSR-T U1	−0.101	0.061	−0.242	−1.648	0.109	−0.226	0.024
	MSR-T K1	0.104	0.045	0.305	2.338	0.025	0.014	0.195
	MSR-T M1	0.065	0.055	0.204	1.178	0.247	−0.047	0.178

Note. PSS-10 = Perceives Stress Scale, MP1 = Measurement Point 1, MP2 = Measurement Point 2, MSR-T S1 = MSR-T subscore self-care at Measurement Point 1, MSR-T U1 = MSR-T subscore teaching at Measurement Point 1, MSR-T K1 = MSR-T subscore communication at Measurement Point 1, MSR-T M1 = MSR-T subscore self-motivation at Measurement Point 1.

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