

Research Article

Teachers' experiences of stress and their coping strategies during COVID-19 induced distance teaching

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Mastering distance teaching imposed by the COVID-19 pandemic was challenging for many teachers. In the present cross-sectional survey, we assessed the level of stress that teachers experienced during the lockdown of schools in Germany, their strategies to cope with it, and external and internal barriers for distance teaching with an online questionnaire. Teachers were recruited for the study on the basis of nationwide professional networks (e.g. Eduserver – Education in Germany, The German Education Union (GEW)) as well as by advertising the study on homepages of associations for different special educational needs and in social networks (e.g. Facebook, Instagram). A total of 380 teachers from different school forms participated. They experienced medium to high levels of stress. More than 50 percent of them spent more than four hours daily on remote teaching, with secondary grammar school teachers experiencing significantly more stress and working more hours daily than special education teachers. The vast majority of them experienced technical barriers, but most of them felt able to cope functionally with the stress. Female teachers experienced significantly more stress, but coped with it more often in a functional way; teachers used more functional coping strategies when they expected external factors as barriers for distance teaching. The results imply that teachers' digital skills should be developed, schools should be better equipped with the necessary computer hard- and software, and more research on psychological factors contributing to teachers' willingness to use technologies for remote teaching in the pandemic and beyond should be done.

Keywords: Pandemic; Lockdown; Stress; Functional/dysfunctional coping; Distance teaching

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1. Introduction

The COVID-19 pandemic resulted in unprecedented actions in the area of education: From the 13th of March to the 23rd of April, all schools in Germany were closed, and teachers had to teach their students from home. Thereafter, schools opened partly and stepwise. In Germany, the distance teaching imposed by the COVID-19 pandemic was a mixture of traditional public schooling and homeschooling (Wrase, 2020). Whereas schools set up the curriculum and teachers provided tasks and instructions, parents were expected to implement these tasks and instructions.

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Neither the parents nor the teachers were well prepared to master the multiple challenges these changes imposed on them. Many parents experienced unstructured task transmission by teachers and a lack of teacher feedback (Wildemann & Hosenfeld, 2020), whereas teachers struggled with keeping their relationships to their students and missed advice and support from their schools (Goetz, 2020). Presumably, the gap in students' achievement between families of high and low socioeconomic status will be widened due to differences in material and educational resources, living space, or availability of time, when children were taught at home (Anger & Plünnecke, 2020; Bol, 2020).

Little is known about factors that contributed to difficulties of teachers to ensure continuation of instruction, when most teaching was conducted from home. For example, schools and teachers became increasingly dependent on digital tools for both teaching and communication processes. Whereas for some teachers, using the internet, communicating via social-media channels or using video-conference tools did not pose a real problem, other teachers might experience remote teaching as a burden (Quezada, Talbot & Quezada-Parker, 2020). Depending on their (technical) skills some teachers may have perceived the situation as positive, whereas others considered it as irrelevant. Moreover, others may have perceived it as negative and stressful (Drossel, Eickelmann, Schaumburg & Labusch, 2019). If the latter is the case, it can be a potential stressor and might in turn result in the experience of stress and lower well-being (Skaalvik & Skaalvik, 2018).

In a survey conducted in Germany between the 2nd and the 14th of April 2020, Eickelmann and Drossel (2020) revealed that on average only 33 % of $N = 310$ teachers felt well prepared for remote teaching, with teachers serving in the highest track of secondary school (Gymnasium) feeling more prepared than those teaching in lower tracks of secondary school or in primary school. The authors explain the difference between the school tracks as a result of differences in supply with hardware and knowledge in software between students of different tracks, with primary-school students being the least skilled and worst equipped groups of students (Eickelmann & Drossel, 2020). Furthermore, 34 % of the teachers in this survey experienced the new situation as a burden, whereas 36 % of the teachers indicated that they benefitted from remote teaching. Currently, we still do not know much about the psychological factors that account for the differences in teachers' experiences of remote teaching and their actual teaching behavior. For example, it is unclear why and how some teachers maintained daily contact to and relationships with students and parents during the lockdown, whereas others made contact to their students and parents only once a week (Porsch & Porsch, 2020), or why some teachers mastered digital technologies, whereas others experienced discomfort.

Major barriers limiting teachers' ability to use and integrate technology into classrooms are lack of resources, time, and support (e.g., Pittman & Gaines, 2015). Ample studies have shown that teachers are prone to experience stress when they feel lack of support and time when teaching students (e.g. Kyriacou, 2010; Pithers & Soden, 1998; Travers & Cooper, 1996). In addition, teachers are also likely to experience stress if they have to use technology for which they do not feel competent enough (e.g., Al-Fudail & Mellar, 2008). During the lockdown, both conditions certainly applied. Stressors outside of work can also play a key role, such as socio-demographic factors or coping strategies. Carver, Scheier, and Weintraub (1989) distinguished between different styles of coping with stress, which could be either active or functional on the one hand or could impede activity and hence be dysfunctional on the other hand.

The current study aimed at closing the gap between what is already known about stressors affecting teachers' remote teaching practices, and how teachers actually overcame the stress during the COVID-19 imposed lockdown.

1.1. Research Question and Hypotheses

With the current research, we examined the level of stress that teachers experienced during the lockdown of schools in Germany, their strategies to cope with it, and external and internal barriers for distance teaching. We expected that teachers who taught in the highest track of secondary

school were on average experiencing lower levels of stress than teachers teaching in lower tracks of secondary school or in primary school (cf. Eickelmann & Drossel, 2020). We assumed that stress was induced during the lockdown by lack of sufficient support, both technical and social, and excessive workload regarding the use of computer technology and social media. We anticipated that teachers would use both functional and dysfunctional coping styles with a higher prevalence of functional styles. Moreover, we investigated the influence of socio-demographic factors on level of stress, coping strategies, and experienced barriers.

2. Method

2.1. Research Design and Participants

In our cross-sectional study, $N = 380$ teachers participated. The participants were selected using an ad-hoc sampling strategy. They were recruited via professional networks (e.g. Eduserver – Education in Germany, The German Education Union (GEW)) as well as by advertising the study on homepages of associations for different special educational needs and in social networks (e.g. Facebook, Instagram). From all participating teachers, 307 (79.7 %) provided full data sets. 77 (20.3 %) participants showed some data missing that were identified as missing completely at random, $\chi^2_{(1)} = 3.38$, $p = .07$. We therefore decided to use listwise deletion for handling missing values (Cheema, 2012). 27.6 % of the participants were primary school teachers, 21.2 % were teaching in the lower tracks of secondary modern school or in comprehensive school, 31.7 % were teaching in the highest track of grammar school, and 19.5 % were teaching in special schools for students with different developmental challenges. Of the participants, 293 (77 %) were female, 86 (23 %) were male, and one participant identified with a diverse gender. Their mean age was 43.7 years ($SD = 10.6$).

2.2. Instruments and Data Gathering Procedure

The participants filled out an online questionnaire on their perceived stress level, coping strategies, experienced barriers during distance teaching, and socio-demographic data.

2.2.1. Stress level

We asked teachers how often they have felt nervous or stressed during the last four weeks, with the response choices on a five-point Likert Scale “never,” “rarely,” “sometimes,” “rather often,” and “very often.”

2.2.2. Coping strategies

We assessed the different strategies to deal with the experienced stress with a shortened version of the COPE questionnaire (Carver et al., 1989). The COPE is a self-report measure consisting of 52 items assessing coping along 14 theoretically-based subscales. The questionnaire encompasses a range of functional and dysfunctional coping strategies, which are active coping, planning, denial, suppression of competing activities, restraint coping, instrumental support, emotional support, positive reinterpretation, acceptance, religion, venting emotions, behavioral disengagement, mental disengagement, and alcohol-drug disengagement. The self-developed shortened version consisted of 27 items representing all 14 coping strategies. The participants’ response choices were on a four-point Likert Scale “I didn’t do this at all,” “I did this a little bit,” “I did this a medium amount,” and “I did this a lot”.

2.2.3. Barriers experienced during distance teaching

The barriers that teachers experienced were assessed by 11 self-developed multi-choice items that were preceded by the following question: “Which were the biggest obstacles for you to do successful distance teaching?” The items could be either accepted or denied: excessive workload for students; excessive workload for parents; low housing conditions; lack of access to computer hardware; low internet connectivity; low motivation of students; low motivation of parents;

parents' low level of organization of temporal schedules; school's low level of organization of temporal schedules; own low level of organization of temporal schedules; low digital competence.

2.2.4. Socio-demographic data

In addition, we assessed some socio-demographic data from the participants (age, gender, type of school, federal state of school) as well as their estimate of the daily duration of teaching from home (in hours).

2.3. Statistical Analyses

For further data processing, we factor analyzed the 14 coping strategy scales and revealed 4 factors with eigenvalues larger than 1.0. After varimax rotation, scales loading high on the first and the third factor were combined to a dysfunctional coping strategies scale, whereas scales loading high on factor two and four were combined to a functional coping strategies scale. Functional coping strategies were related to mastering the situation in a proactive und effortful way. Functional coping strategies included active coping (e.g., to concentrate efforts on doing something about the situation), suppression of competing activities (e.g., focusing on dealing with the problem), restraint coping (e.g., forcing oneself to wait for the right time to do something), planning (e.g., thinking about how to best handle the situation), and seeking social support (e.g., getting emotional support from friends or relatives). In contrast, dysfunctional coping strategies were related to avoiding proactive and deliberate mastering, and to abdicating from one's responsibility for managing the new situation. Dysfunctional coping strategies involved denial (e.g., acting as if this situation has never happened), venting of emotions (e.g., getting upset and letting emotions out), mental disengagement (e.g., watching TV to think about it less), behavioral disengagement (e.g., giving up to attempt goals), and alcohol- or drug-related disengagement (e.g., drinking alcohol or taking drugs in order to think about it less). Dysfunctional coping strategies did also entail the inverse of positive reinterpretation of the situation, e.g., not to learn something from the situation, and the inverse of acceptance, e.g., not to learn to live with it. The internal consistency of the new created scales was sufficient, with $\alpha = .73$ for the functional coping strategies scale and the same value for the dysfunctional coping strategies scale.

All metric variables were analyzed by using parametric statistical procedures. Non-metric variables were analyzed by using Chi-Square tests or Spearman rank correlations.

3. Results

3.1. Level of Stress

Teachers experienced on average a medium-to-high amount of stress during the lockdown, indicated by a mean value of 3.64 ($SD = 0.98$) on the five-point Likert scale. Teachers level of experienced stress differed between school types, $F_{(3, 289)} = 4.88, p < .001, \eta^2 = .05$.

As Figure 1 illustrates, teachers in the highest track experienced the most severe stress ($M = 3.89, SD = 0.95$), teachers in special education experienced the lowest level of stress ($M = 3.26, SD = 0.90$). Primary school teachers ($M = 3.56, SD = 0.99$) and teachers of lower tracks of secondary school ($M = 3.56, SD = .97$) were in-between. Scheffé post hoc tests revealed significant differences of experienced stress level only between teachers of the highest track and teachers in special education, $p = .002$. Moreover, stress level was higher in female ($M = 3.71, SD = 1.10$) than male teachers ($M = 3.41, SD = 0.94$), $t_{(377)} = -2.56, p = .011$.

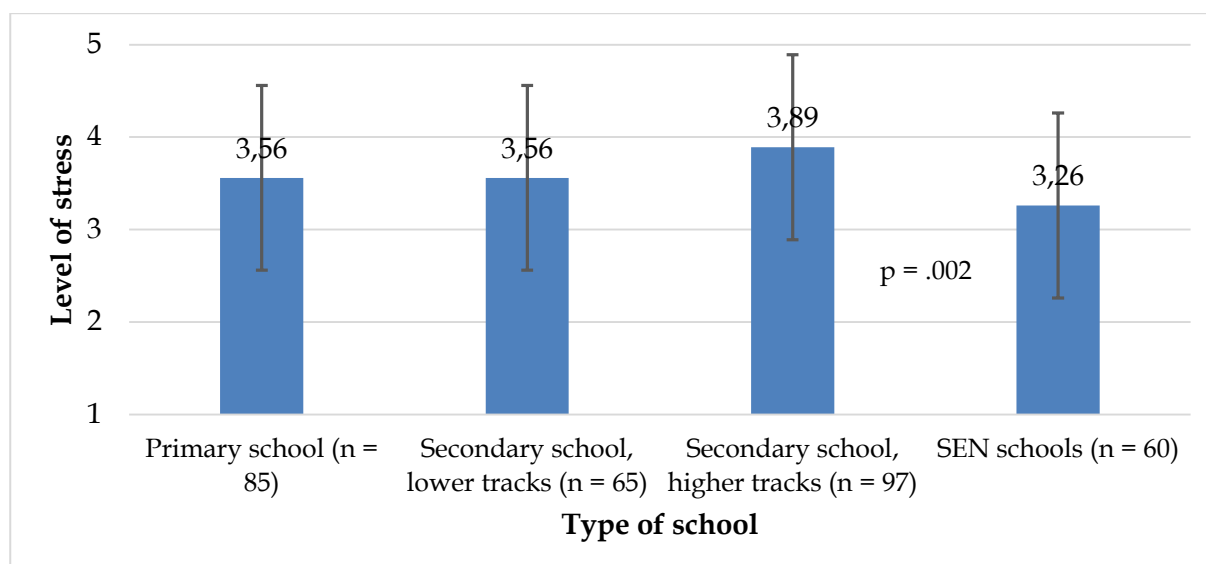


Figure 1. Experienced level of stress according to type of school

3.2. Duration of distance teaching and experienced obstacles

Of the teachers participating in our study, 56.6 % ($n = 215$) indicated to teach more than four hours daily, 18.7 % ($n = 71$) stated to teach about three to four hours daily, 9.7 % ($n = 37$) specified their daily teaching activities to last no longer than two hours, and 15.0 % ($n = 57$) did not specify their teaching duration. Teachers spending more hours a day with remote teaching activities experienced significantly more stress than did teachers spending less time, $r = .41$, $p < .001$.

There were no significant gender differences regarding the duration of distance teaching, $r = -.04$, $p = .490$, but significant differences between school types, $\chi^2_{(9)} = 28.38$, $p = .001$. Grammar school teachers had the greatest daily workload in terms of teaching duration, with 87.1 % specifying their daily teaching time longer than four hours, whereas only 56.5 % of special education teachers did the same amount of teaching per day.

Teachers most often agreed that the lack of adequate hardware was a barrier for successful teaching. Often mentioned were also excessive workload and low motivation of the students. As Table 1 displays, about half of the participants considered excessive workload of parents and low internet connectivity as barriers for their teaching. About one third of the teachers were concerned about their own housing conditions, their own level of organization, and the low motivation of parents. Less than 20 % of the participants agreed that the school's and their own level of organization as well as their digital competence contributed to impeding their teaching from home. On average, teachers experienced 4.52 ($SD = 2.04$) from a total of 11 presented barriers.

Table 1

Frequency of barriers teachers experienced during distance teaching (percentage of teachers who agreed)

Excessive workload for students	68.6
Excessive workload for parents	54.8
Low housing conditions	35.7
Lack of access to computer hardware	69.7
Low internet connectivity	50.1
Low motivation of students	66.9
Low motivation of parents	26.8
Parents' low level of organization	32.3
School's low level of organization	18.7
Own low level of organization	13.0
Low digital competence	15.0

There were no significant differences in the number of experienced barriers between the types of school they were teaching at, $F_{(3, 264)} = 0.38, p = .768$. The level of perceived stress and the number of experienced barriers did not correlate significantly, $r = .07, p = .184$.

3.3. Coping Strategies

When experiencing stress, teachers made use of both coping strategies. But what type of strategy did they prefer, and under which conditions?

Teachers applied on average more functional ($M = 2.59, SD = 0.45$) than dysfunctional coping strategies ($M = 1.70, SD = 0.39$), $t_{(359)} = 27.71, p < .001$. The more stress was experienced, the more coping strategies were applied to master the situation. The use of both functional ($r = .25, p < .001$) and dysfunctional ($r = .40, p < .001$) coping strategies was positively related to stress experience.

Teachers' choice of coping strategies was primarily affected by what they experienced as a burden. The use of functional coping strategies was positively related to the teachers' perception of low motivation of parents ($r = .15, p = .005$) and their experience of a school's low level of organization ($r = .20, p < .001$). In contrast, the use of dysfunctional coping strategies was positively related to their perception of high student workload ($r = .12, p = .032$), low perceived digital competence ($r = .23, p < .001$), their own low level of organization ($r = .14, p = .009$), and again the school's low level of organization ($r = .15, p = .006$). Table 2 shows all correlation coefficients regarding the relationship between coping strategies and experienced barriers.

Table 2

Correlation coefficients indicating relationships between coping strategies and experienced barriers

	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Functional coping (1)	-.03	-.07	.05	.07	-.08	.05	-.08	.15**	.04	.20**	-.03	.01
Dysfunctional coping (2)	1	.12*	.02	.08	.01	.00	.09	.07	.05	.15**	.14**	.23**
Excessive workload for students (3)		1	.25**	.10	.19**	.11*	.20**	.03	.08	.02	.04	.09
Excessive workload for parents (4)			1	.29**	.17**	-.02	.00	.30**	.42**	-.05	-.01	-.01
Low housing conditions (5)				1	.26**	.15**	.01	.23**	.24**	.04	.05	-.03
Lack of access to computer hardware (6)					1	.26**	.04	.00	.07	-.13*	-.08	-.01
Low internet connectivity (7)						1	.02	-.02	.02	.01	-.01	-.00
Low motivation of students (8)							1	.23**	.13*	.10	.04	-.01
Low motivation of parents (9)								1	.35**	.08	.06	-.04
Parents' low level of organization (10)									1	.00	.14*	-.01
School's low level of organization (11)										1	.21**	-.02
Own low level of organization (12)											1	.03
Low digital competence (13)												1

Note: *: $p < .05$; **: $p < .01$

The longer teachers worked at home, the more likely they were to apply functional coping strategies ($r = .22, p < .001$). Moreover, females more often applied functional coping strategies ($M = 2.62, SD = 0.43$) than males ($M = 2.46, SD = 0.48$), $t_{(357)} = -2.91, p = .004$, whereas gender did not matter in regard to the execution of dysfunctional coping strategies ($p = .796$).

4. Discussion

This study revealed three major results. First, the level of stress experienced by teachers was medium to high. Since we do not know the level of stress before the lockdown, we will abstain from interpreting it. However, we found a substantial relationship between teachers' subjective stress level and their type of school. Contrary to our hypothesis, teachers from the highest track of secondary school (grammar school) experienced the highest level of stress, whereas those from special education classes experienced the least. Presumably, teachers in the highest track posed more workload on their students compared to teachers from other schools, so that students in the highest track were likely to disengage from instruction, and teachers found them less motivated.

Second, more than half of all participating teachers spent more than four hours a day on remote teaching and experienced significantly more stress than teachers spending less time a day in teaching activities. However, teaching time differed between school types. Teaching time was longest with grammar school teachers and shortest with special education teachers. Possibly, recommendations for distance teaching and learning from educational policy were more explicit and pronounced for regular schools than for special educational schools and even more focused on pupils switching from elementary school to secondary schools and graduates from school (Huber & Helm, 2020), forcing secondary school teachers in the higher tracks to spend more time with distance teaching and experiencing more stress due to technical problems. The expert statements of the Leopoldina (2020) underline that children and their parents from elementary and primary school need the most support and the caring services of school, but they did not mention students with special educational needs. Three essential functions of schooling are abrogated due to the shutdown: a) the structured learning environment pupils with ADHD, Autism Spectrum Disorders and other neurodevelopmental challenges need the most, b) the learning supportive social exchange with peers and teachers that practices societal participation, especially important for pupils with socio-emotional and language problems, and c) professional, differentiated feedback to advances in learning that are essential for pupils with learning disabilities.

The vast majority of teachers considered the lack of adequate computer equipment, alongside with a low internet connectivity, as major barriers for successful teaching. This result mirrors complaints that diverse agents in society have made years ago (e.g., Harwardt, 2020). Thus, teachers faced technological problems that were already known, but during the lockdown they became visible. Furthermore, teachers felt constrained by excessive student workload and their low motivation for doing schoolwork at home. When teachers experienced that their students were overstrained by distance teaching and learning, they may have feared a tendency for them to employ a surface learning approach (Kember & Leung, 2006), which in turn might prevent them for reaching the learning goals. In addition, low motivation of students would also prevent them for reaching learning goals. Students' low motivation might have been the result of a combination of both students' low-to-medium computer and internet skills (Eickelmann, Bos, Gerick & Labusch, 2019), and teachers' low ability to facilitate online learning and to overcome technological limitations (Fryer & Bovee, 2016). However, there was no significant relationship between type of school and the number of barriers experienced by teachers. Since the mere number of experienced barriers and the level of stress did not correlate significantly, the number of barriers seems to cover a different aspect of subjective pressure than perceived stress.

Third, the result that teachers applied on average more functional coping strategies (e.g., planning or seeking social support) than dysfunctional coping strategies (e.g., giving up to attempt goals or drinking alcohol) underlines that most of them felt able to actively and deliberately manage distance teaching. However, although many teachers preferred functional over

dysfunctional strategies, almost all of them also used dysfunctional strategies, like, for instance, watching more TV or abandoning personal goals.

Teachers were more likely to use functional than dysfunctional coping strategies when they attributed the causes of their constraints to external factors, like parents' low motivation or the school's low level of organization. However, when they internalized the constraints, e.g. when they complained about their own level of organization or the low level of digital competence, they preferred dysfunctional over functional coping strategies.

Female teachers were more stressed than male teachers, but female teachers also used more often functional coping strategies than their male colleagues. Elevated work stress of females might stem from gender differences in domains outside of work, such that female teachers may experience higher workload for teaching and domestic tasks at the same time or a sharper conflict between work and family roles (Greenglass & Burke, 2003). It may also be that teachers who perceived greater stress from responsibility for students' achievement exerted more effort during lesson planning and distance teaching and thus used more functional than dysfunctional coping strategies (cf. Klassen & Chiu, 2010).

4.1. Limitations of the Study

One limitation of the present study is the non-representativeness of the sample we used. Since we did not apply a deliberate sampling strategy, teachers were recruited for the study on the basis of professional networks as well as by advertising the study in social networks. Our research instrument is self-constructed, although the assessment of coping strategies is adapted from the COPE. The factor structure and the internal consistency could be replicated for the shortened version used, but the quality criteria are only acceptable. Moreover, causal implications are not possible because of the correlational design of the study.

4.2. Implications of the Study

One implication of the results obtained is that in order to enhance teachers' digital skills, training programs have to be developed and applied to teachers wherein they are trained in using digital tools for remote teaching. Teachers should also be equipped by their schools or local authorities with computer hard- and software that is necessary for distance teaching. Both supply with technologies and training how to use them could eliminate at least one important barrier that teachers were faced with during distance teaching. Since teachers experienced a medium to high amount of stress during the lockdown, and did also use dysfunctional in addition to functional coping strategies, coping competencies should also be trained by professional trainers. Moreover, more research should be done in order to examine psychological factors that contribute to teachers' willingness to use technologies for remote teaching in the pandemic and beyond. Researchers have suggested that major barriers limiting teachers' ability to use and integrate technology into classrooms are lack of resources, time, and support (e.g., Pittman & Gaines, 2015). Besides these external barriers, internal factors may be of even more relevance (Ottenbreit-Leftwich, Liao, Sadik & Ertmer, 2018). Motivational factors, attitudes, knowledge and self-efficacy, for instance, have been suggested as reasons for teachers' reluctance to incorporate technology into their classrooms.

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