

Perceived teacher stress during COVID-19 pandemic

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Abstract

The rapid change in education in March 2020, triggered by the pandemic, prompted an equally swift response from stakeholders, managers, teachers, and, not least, pupils. Struggling with physical, technological, and methodological problems, teachers also had to contend with the social isolation of their pupils, as well as the emotional, technical, and learning challenges faced by the pupils, all of which, of course, had an impact on their own mental and physical well-being. The aim of the study is to investigate the extent to which the ability to use online tools influences the stress teachers faced during a pandemic, similar to the effect of school and government management support on stress intensity. The sample for this study comprised 72 male and female participants between the ages of 24 and 54 years. Convenient sampling was employed to collect data. The questionnaire with binary, Likert scale, and open-ended questions was administered to the sample. Correlation tests and t-tests were used to analyze the data in this study. The research revealed a statistically significant medium negative correlation between the intensity of stress and the ability to use digital tools, as well as a similar correlation between stress and the perceived support from the government. The results indicate that teachers' ability to use online tools significantly improved during the pandemic. However, it also highlights the urgent need for changes in teacher training education to equip pre-service teachers with 21st-century skills.

Keywords: pandemic, stress, quality of education, online teaching, digital competence

1 Introduction

The pandemic has transformed the way we live, with one of the most noticeable changes being the increased reliance on online shopping and delivery services. Similarly, communication with various institutions has undergone a significant shift, with processes being streamlined through the adoption of e-communication, becoming a preferred method in some cases. Education, too, has experienced both positive and negative influences in the wake of these changes.

The sudden and unexpected nature of the pandemic has brought about a paradigm shift in the way learners are being taught. The necessity for altered communication, driven by Covid-19 and lockdowns, compelled teachers to embrace technologies and digital tools that may have been unfamiliar to them before. This new situation resulted in frequent adjustments that teachers had to adapt to, impacting not only the methods and forms of instruction but also the daily lives of both teachers and learners.

The majority of previous studies focused their attention on learners and the problems they faced in the then-current situation (Abbasi et al., 2020; Baloran et al., 2021; Koob et al., 2021). Undoubtedly, their situation was exceptionally difficult and demanding, considering the changes in teaching formats, technologies employed, and the conditions learners experienced at home (including not only technological aspects but also spatial constraints). The ability to work independently and autonomously also played a significant role in the effectiveness of teaching in the then-current situation.

The first wave, spanning from January to March 2020, was characterized by "abrupt transitions to remote learning with varied success through a range of online platforms" (Campbell et al., 2021, p. 1). Initially, teachers attempted to substitute in-class teaching, primarily by sending materials with tasks, and many believed this would be a short-term situation. However, after a few weeks, most teachers realized the gravity of the situation and began using video conferencing to deliver content.

The first wave was predominantly characterized by fear, uncertainty, knowledge sharing, and the exchange of experiences. In September, there was a sense of hope as schools reopened, and lessons resumed with in-class sessions. However, after a brief period, it transitioned back to online mode. The Ministry of Education and various

activists attempted to provide support through webinars and guides on using different online tools, creating platforms to showcase educational tools.

The second wave rolled across Europe from October 2020 to May 2021. In Slovakia, elementary and secondary schools experienced several closures based on the incidence of cases, causing anxiety among schools that belonged to the front lines. Vaccination, which began in late December, brought renewed hope, with teachers given priority. Despite this, the majority of universities remained closed in online mode until the end of the academic year, except for health care and medicine students. This wave was marked by a gradual sense of apathy and reluctance to address technical and behavioral issues, as teachers expected a high level of pupil engagement and an understanding of their co-responsibility for their education outcomes.

Both the second and third waves imposed new demands on teachers, who had to adhere to safety measures and protocols such as social distancing, wearing masks, and overseeing handwashing and disinfecting. Teachers transitioned from in-class teaching to hybrid classes, where some classes were taught online, and non-vaccinated students were placed in quarantine to prevent the spread of Covid-19, while the rest attended in person. Teaching modes varied from school to school, as did the situations of vaccinated and non-vaccinated teachers, who, in case of contact with a positive person, had to be isolated and go into quarantine. Teachers faced daily exposure to the risk of teaching classes with a high number of students. According to Collier & Burke (2021, p. 16), teachers "expressed fears for their own health and families, worries about the impacts of social distancing in classrooms and concerns about insufficient teaching tools and resources".

2 Literature review

The change of the forms and methods applied in the online environment in remote teaching also resulted in the shift of roles of the teacher and teachers were not prepared for this situation. Saxena (2020, p. 14) pointed to the change of teacher's role in the pandemic situation (what he calls "new normal") and concluded that "from preparing a personalised curriculum for courses to being a content creator to mentoring students on real-world projects to ensure that they are job-proof, and upskilling themselves to stay abreast of emerging technology and skills, today's educators dabble in many things. From being facilitators of learning, educators have also turned to be innovators."

As mentioned above we face a rapid move to online learning and this will influence the way learners are taught. We may presume that the elementary and secondary school teachers will apply generally the elements of technology-enhanced learning, and universities will apply the elements of blended learning which can lead towards higher internationalisation of teaching and learning, and less help-seeking behaviours compared to on-campus students (Richardson et al., 2012)

Panisoara et al. (2020, p. 2) highlight that "online environments for teaching and learning can be effective, but only when the conditions in which teachers can successfully continue teaching are known." The truth is that gaps in (tech) skills, problems with technology, and no experience with online tools and online teaching influenced the education process (see Burgerová, Piskura, 2021).

The negative aspects of online learning are also the subject of research. Lodha (2019) based on her research stated the negative impacts of increased time spent online on mental health. Similarly, Zheng et al. (2016) warned that the negative effects of internet use should not be underestimated and their data showed that the most complaints were dry eyes, cervical pain, lumbar pain, wrist pain and neck complaints.

Data from several sources have identified the increased stress and burnout syndromes teachers observed. The countries have taken (and are taking) actions according to the development of the pandemic in their countries. Even though the measures taken through countries differ, to a large extent, it can be seen that the problems teachers and learners face in this difficult situation in different countries are similar. Steiner and Woo (2021) in their survey that was realised in the U.S. (n = 1819) in January and February 2021 reported that almost 25% were considering leaving their job. The majority of respondents stated they experienced job-related stress and burnout; every fourth teacher observed symptoms of depression. The stressful work during the pandemic was also reported by e.g. Jakubowski & Sitko-Dominik (2021), who realised their research among 285 Polish primary and secondary school teachers and Stachteas & Stachteas (2020), who studied the situation in a group of secondary school teachers in Greece.

Panisoara et al. (2020) speak about occupational stress, examining burnout and technostress in tandem. They collected data from 980 in-service teachers in the period April and May 2020 (i.e. soon after the schools' closure) in Romania, and the authors were looking for correlations with motivation, self-efficacy and continuance intention to use online instruction. The results showed that the occupational stress variable was negatively affected by intrinsic motivation and positively by extrinsic motivation. Moreover, a small indirect influence of burnout and technostress on the link between intrinsic and extrinsic motivation and continuance intention was observed.

Occupational stress was also the subject of the research conducted by Johnson et al (2005) who comparing 26 occupations found that teachers belong to the six most stressful occupations regarding physical and psychological well-being. The similar results were reported by e.g. Kokkinen et al (2014); Ingersoll (2003).

The most common sources of stress teachers face belong teaching pupils who lack motivation; maintaining discipline; time pressures and workload; coping with change; being evaluated by others; dealings with colleagues; self-esteem and status; administration and management; role conflict and ambiguity; and poor working conditions (Kyriacou, 2001, p. 29). Petrakova et al. (2021, p. 81) interviewed 14 teachers and revealed the following factors as increasing the stress in pandemic: "administrative support (or lack of it), increased workload caused by the need to seek new teaching methods and keep in touch with students, intensified communication with parents, and disrupted work-life-balance".

Steiner and Woo (2021) reported that as many as 20% of teachers feel tense about their job all or most of the time, compared with 12,5% in similar professions. In the pandemic period the situation even worsened and according to the U.S Teacher survey realised in 2021 there are 78% of teachers who reported frequent job-related stress, compared to 40% of other US adults. It is even more worrying that 27% of teachers reported symptoms of depression, compared to 10% of other adults. In Collie's study (2021) on pandemic influence on teacher somatic burden, stress, and emotional exhaustion have been observed. In her research, she collected data from 325 Australian teachers in May 2020 and found that autonomy-thwarting leadership was positively associated with emotional exhaustion.

Experiencing chronic stress leads to mental health difficulties (Breaux et al., 2021; Richardson et al., 2012), memory problems, inability to concentrate, but also physical problems, such as chest pain, rapid heart rate, skin irritation, insomnia, nausea, diarrhea, etc. (Cherry, 2021; Richardson et al., 2012), cognitive disorders (Yaribeygi et al, 2017).

The research on the influence of pandemic on perceived teacher stress is ongoing and growing, but it is still in its early stages. While there have been a number of studies that have investigated the impacts of the pandemic on teachers and their stress levels, the evidence base is not yet robust enough to fully understand the complexity of these effects. Whatmore, there are also many factors that can influence teachers' experiences of stress during the pandemic, such as their prior levels of stress, their personal and professional circumstances, and their access to support and resources.

3 Methodology

The study focuses on teachers in the pandemic situation, examining their digital skills at the beginning of the pandemic, the perceived support from government and school management, and how these variables influence the level of teachers' perceived stress. The following hypotheses were assumed:

- H1: The level of perceived stress during the pandemic situation depends on the type of school where teachers work (elementary and secondary).
- H2: The level of perceived stress during the pandemic situation depends on teachers' ability to use digital tools.
- H3: The level of perceived stress depends on the perceived support from the government.
- H4: The level of perceived stress depends on the perceived support from school management.

3.1 Sample description

In Slovakia, there are various pathways to becoming a qualified teacher. The most common route involves completing a 300-credit university study in a teacher training program, often as part of a double-major program. Additionally, graduates from non-teaching study programs can obtain a teaching qualification through a 4-semester part-time study focused on pedagogy, psychology, and methodology, depending on their prior study programs.

The sample for this study consisted of 72 in-service teachers currently in their second year of a methodology course. All participants had previously graduated from non-teaching university master's programs with 300 credits. Within the sample, 91.67% were female, and 8.33% were male. The average age of participants was 34 years (SD = 7.7).

Seventy-one participants were actively teaching both before and during the pandemic situation. The youngest individual in the study, aged 24, began teaching in September 2020. In terms of their employment, 48.61% were teachers at elementary schools (5th - 9th grades), while 51.39% worked at secondary schools. Regarding age distribution, the largest category fell within the 30-39 years range, with the smallest category being in the 50-59 years range, what could be explained by the fact that majority of in-service teachers are usually fully qualified at that age.

Fig. 1: Distribution of sample according to age, type of school and gender

		males	females	total	
24-29				26	36,11%
	elementary s	1	14	15	
	secondary s	1	10	11	
30-39				31	43,06%
	elementary s	1	13	14	
	secondary s	1	16	17	
40-49				11	15,28%
	elementary s	0	6	6	
	secondary s	0	5	5	
50-59				4	5,56%
	elementary s	2	2	4	
	secondary s	0	0	0	
		6	66	72	
		8,33%	91,67%		

3.2 Instruments and procedure

The study employed a mixed methods approach, integrating both quantitative and qualitative data collection. Quantitative analysis aimed to provide insights into two main topics: 1) the level of perceived stress and 2) the mastery of digital skills/ability to use online tools for teaching, observed in March 2020 and October 2021. The qualitative analysis of verbal responses, including open-ended questions in the questionnaire, complemented the quantitative data. Similarly, insights from interviews with four teachers from the sample were incorporated.

A questionnaire was chosen as a widely used and practical method for quickly gathering data, with the added benefit of being respondent-independent during evaluation. Participants were requested to provide feedback on their teaching experiences during the Covid-19 period, responding to 9 dichotomous and 6-point scale questions. Additionally, they were encouraged to freely write about the problems they faced (open-ended question). The decision to use an even-numbered Likert scale aimed to prevent respondents from adopting a neutral stance and encouraged them to express more definitive positive or negative opinions.

Quantitative data from the questionnaires administered in October 2021 were analyzed using Statistica software version 13.5 (Tibco Software). Descriptive statistics were applied to categorical variables, while means with standard deviations were calculated for ordinal variables. Bivariate analysis, inferential statistics, and correlations were used to examine associations between variables such as the ability to use online tools, stress levels, learning with children at home, perceived government support, and perceived school management support. T-tests were employed to assess differences in the perceived ability to use digital tools in online teaching between March 2020 and October 2021. Content analysis was utilized for the examination of open-ended questions and interviews.

4 Results and discussion

The majority of respondents reported experiencing work-related stress and anxiety. The intentional use of an even Likert scale was chosen to allow respondents to rate the level of agreement or express the intensity of the studied phenomenon rather than providing a simple yes-no response. Less than one-fifth of the participants reported a lower level of stress, ranging from 1 to 3 on a 6-point Likert scale (see Figure 2). Approximately 34.7% of respondents claimed to experience work-related stress at level 4, with a slightly lower number reporting their stress level at 5. The mean value is 7.37 (SD=1.156), indicating an overall moderate level of reported stress.

While some stress is considered normal and, in certain cases, can have positive effects (Kirby et al., 2013; Schönfeld et al., 2016), it can also exert a significantly negative impact on mental and physical health. Many countries, including Great Britain, the USA, and Slovakia, have reported an increased number of self-reported cases of stress, and education belong among industries with higher than average rates of stress. The pandemic situation has introduced new challenges, along with additional duties, demands, and needs.

To describe stress symptoms, characteristics of high scorers on the stress DASS scale (Lovibond and Lovibond, 1995) were used in the questionnaire, including feelings of tension, inability to relax, being touchy, irritability, and over-reacting to situations.

Recognizing that small-scale research may yield non-reliable and non-valid results, a meta-analysis is employed to enhance the generalizability of findings and provide a systematic review of previous research results. The meta-analysis, synthesizing results from five different studies, led authors to the conclusion that "higher anxiety levels were found at elementary levels of education, as expected, but more teachers with stress were found among university teachers" (Ozamiz-Etxebarria et al., 2021).

Fig. 2: The perceived level of stress

Frequency table: stress				
Category	Count	Cumulative Count	Percent	Cumulative Percent
1	2	2	2.778	2.778
2	2	4	2.778	5.556
3	9	13	12.500	18.056
4	25	38	34.722	52.778
5	22	60	30.556	83.333
6	12	72	16.667	100.000
Missing	0	72	0.000	100.000

Note: 1 normal, 2 minor, 3 mild, 4 moderate, 5 severe, 6 extremely severe stress

Given that the studied sample included teachers from both elementary and secondary schools, the expectation was a statistically significant difference in the perceived stress levels between these two groups. However, the hypothesis was not confirmed, and the subsequent graph displays the observed levels of stress in both groups.

Fig. 3: Boxplot: Stress level according to the type of school

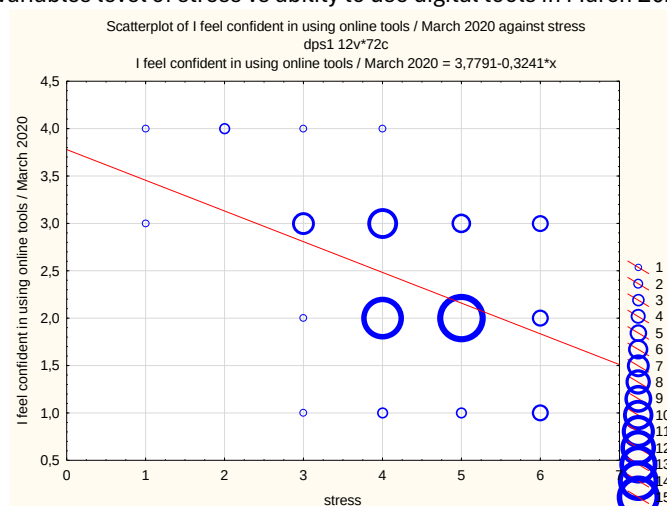


Note: 1 elementary school, 2 secondary school

One of the needs directly connected with school closures, lockdowns, and the shift to virtual learning was the necessity of utilizing digital tools for teaching delivery.

The respondents self-evaluated their skills to work online and use digital tools at two different time points: March 2020, during the initial stages of the pandemic and its impact on coronavirus disease transmission, and 18 months later in September 2021. The following scatterplot and table illustrate the correlation between two variables – the ability to use digital tools in March 2020 and the level of stress.

Fig. 4: Scatterplot of variables level of stress vs ability to use digital tools in March 2020



A moderate downhill correlation ($r = -.47$; $p < 0.01$; $r^2 = 0.22$) was observed between the variables stress and perceived confidence of teachers in using online tools. Considering the age of respondents, having digital natives (Prensky 2001) in a sample, we expected that at least those respondents would evaluate their skills positively. Similarly, knowing how many teachers passed the courses on using technologies as a part of their life-long education, we expected a higher level of awareness. Surprisingly, no respondent evaluated their skills as completely confident and the vast majority opted for level 2 slightly confident (see fig.5).

Fig. 5: Frequency table: Ability to use digital tools in March 2020

Frequency table: I feel confident in using online tools / March 2020				
Category	Count	Cumulative Count	Percent	Cumulative Percent
1	9	9	12.500	12.500
2	33	42	45.833	58.333
3	25	67	34.722	93.056
4	5	72	6.944	100.000
5	0	72	0.000	100.000
6	0	72	0.000	100.000
Missing	0	72	0.000	100.000

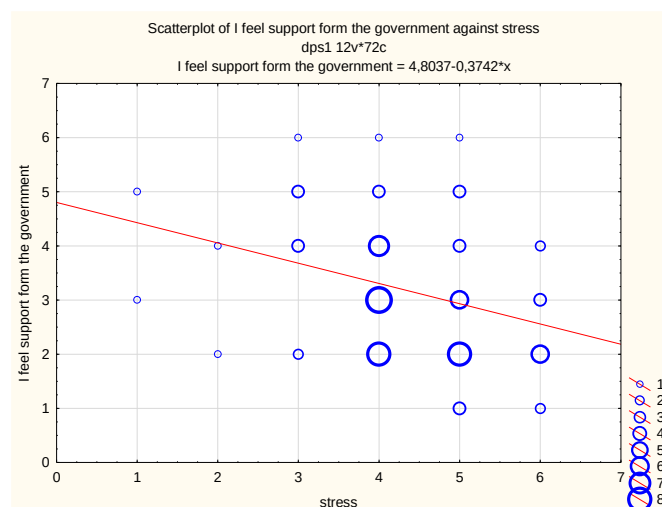
Note: 1 not confident at all – 6 completely confident

Returning to the hypothesis 2 presented at the beginning of this study, it is now possible to state that, based on the data, digital competence influenced the level of perceived stress during the pandemic situation.

Throughout the tumultuous pandemic situation, especially in the initial months, a high number of press conferences were conducted (with several per day at the beginning of the pandemic), disseminating new information about the global and Slovakian situation. These conferences conveyed both negative aspects and solutions to address the challenges. In the realm of education, financial support for technical equipment, provision of data for schools and pupils at no cost, web portals aggregating educational materials, and TV educational programs tailored for young learners were developed. NGOs similarly supported educational activities, organizing webinars for teachers. Teachers, however, found themselves in a situation where they were inundated with information, had to comply with government regulations, simultaneously prepare for teaching, and navigate the situation within their own families, all without a clear understanding of how long the situation would last.

Positive support, feedback, and evaluation are crucial factors influencing teachers' motivation, and cultivating motivation is paramount for stress reduction. The following figure illustrates the relationship between perceived support from governments and the level of stress.

Fig. 6: Scatterplot of variables level of stress vs perceived support from the government



The stress variable is, similarly as in case of ability to use digital tools, associated with the perceived support from the government ($r = -.33$, $p < 0.01$). Here again we observe negative, inverse correlation indicating, as expected,

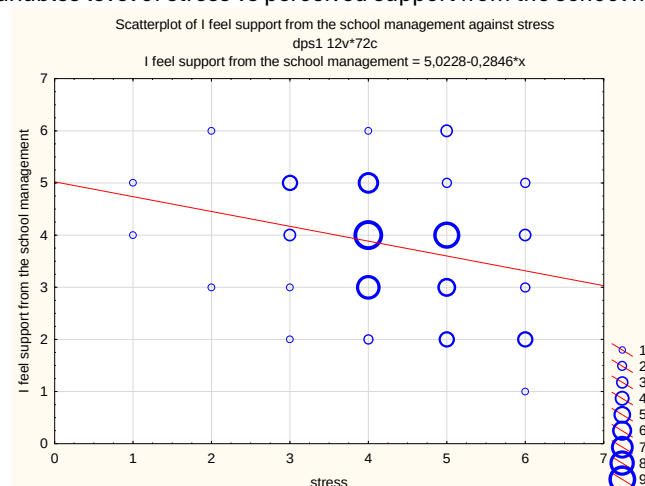
that both variables move the opposite direction and how important the measures taken by the government are. It is important to mention that the r squared is 0.11 ($p < 0.004$; $r^2 = 0.11$) and we observe a moderate correlation.

Fig. 7: Frequency table: perceived support from the government

Frequency table: I feel support from government				
Category	Count	Cumulative Count	Percent	Cumulative Percet
1	5	5	6.944	6.944
2	22	27	30.556	37.500
3	17	44	23.611	61.111
4	15	59	20.833	81.944
5	10	69	13.889	95.833
6	3	72	4.167	100.000
Missing	0	72	0.000	100.000

The teacher's closest managerial level is the school management and thus we observed how teachers perceived the support from the managerial level. Surprisingly, the test reports a statistically significant ($p < 0.05$) small and negative correlation coefficient ($r = -0.27$; $p < 0.05$; thus, indicating low or no effect of perceived support from the school management on stress. This is quite interesting if we realise that the support from the school management influenced the level of stress teachers felt.

Fig. 8: Scatterplot of variables level of stress vs perceived support from the school management



Comparing Figures 6 and 8, it becomes apparent that teachers perceived support from the school management more positively compared to the support from the government. The act of sharing problems daily and facing the same challenges might have influenced this positive perception. A significant majority of teachers, accounting for more than 61%, expressed positive feelings towards the position and activity of school management during the pandemic situation..

Fig. 9: Frequency table: perceived support from the school management

Frequency table: I feel support from school management				
Category	Count	Cumulative Count	Percent	Cumulative Percet
1	1	1	1.389	1.389
2	11	12	15.278	16.667
3	16	28	22.222	38.889
4	24	52	33.333	72.222
5	15	67	20.833	93.056
6	5	72	6.944	100.000
Missing	0	72	0.000	100.000

It can be assumed that teachers' level of stress depends on the perceived support from the government (H3 confirmed) and does not depend on the perceived support from the school management (H4 rejected).

We also aimed to investigate how the pandemic situation influenced digital skills or the perception of the ability to use online applications that teachers employ in a virtual learning environment. The t-test was used to determine whether there is a significant difference between the means of the two groups, specifically the perceived confidence in using online tools in March 2020 and October 2021.

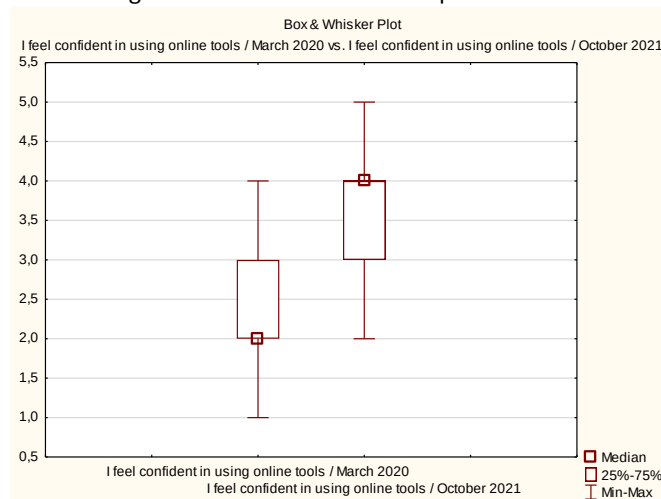
Fig. 10: T test – confidence in using online tools March 2020: September 2021

T-test for Dependent Samples Marked differences are significant at $p < ,05000$										
Variable	Mean	Std. Dv.	N	Diff.	Std. Dv. Diff.	t	df	P	Confid-95%	Confid-95%
I feel confident in using online tools / March 2020	2.361	0.793								
I feel confident in using online tools / October 2021	3.694	0.705	72	-1.333	0.605	-18.696	71	0.000	-1.476	-1.191

The difference between the mean scores between March and October is 1.33 point with the 95% confidence interval [1.476, 1.191]. The progress can be also interpreted via the effect size ($d=1.67$), which was calculated as a proportion of the difference between the scores measured in March and October ($\text{diff}=1.33$) and the standard deviation of the score measured in March ($\text{SD}=0.792$). In this sense we can state that the observed positive increase is 1.67 of the standard deviation.

The following box and whiskers graph displays the difference between the March 2021 and October 2021 where the whiskers show minimum and maximum values recorded and the small box shows the median value. Approximately the middle 50 percent of the data fall inside the box.

Fig. 11: T test – confidence in using online tools March 2020: September 2021



As can be seen from the chart, no respondent indicated a value of 6 (completely confident) in either March or October. It is worth mentioning that half of the respondents selected 1 or 2 option in March, whereas in June there were 50% of respondents who opted for option 3 or 4. Similar results, concerning stress symptoms teachers observe have been found also in other studies as e.g. Santamaría et al (2021), Ozamiz-Etxebarria, et al (2021), Pressley and Learn (2021).

To gain a deeper understanding of the issues perceived as stressful by teachers during online teaching, we conducted online unstructured interviews. The intentional use of semi-structured interviews allowed us to formulate questions based on pre-selected areas during the interviews, adapting to the situation and respondents' reactions. The aim of the semi-structured interviews was to gather information about educators' experiences of teaching during the pandemic, focusing on the following sub-objectives:

- 1) to explore teachers' reflections on online education
- 2) to identify the most challenging areas of their pedagogical activity, including preparation for teaching, implementation of teaching, proficiency in presenting teaching skills, students' readiness for online learning, etc.

To gather information, we approached four respondents from our sample who participated voluntarily. The sample included two primary school teachers and two secondary school teachers, with three females and one male (high school). Online interviews were pre-arranged through MS Teams at a time convenient for the respondents. They were informed in advance about the areas of interest. To ensure anonymity and encourage honest responses, we conducted the interviews individually.

Fig. 12: Profile of teachers participating in research

Respondent	R1	R2	R3	R4
Type of school and length of experience	primary school 5 years of experience	primary school 15 years	secondary school 7 years	secondary school 10 years
Openness	friendly, willing to cooperate	open approach	open, with a tendency to criticise; questions, casts doubts on opinions and facts	emotional expression
Reacting to questions	careful formulation of opinions	self-confident extrovert	constructive with a tendency to negative evaluation	prudent person with a deliberate, careful choice of words
Motivation to participate in the interview	willingness to share own experience	likes the profession and anything that can help should be supported	initially not interested in the profession, but now is happy to be in the profession and has something to say	wants to make his/her teaching work more effective
Other characteristics	doing extra-curricular activities with learners	head teacher	head teacher, science oriented	change place of work in 2020

The interviews were conducted in November 2021. At the outset, we posed more general questions to gain a comprehensive understanding of the studied issue. In the subsequent section, questions were specifically directed at the challenges experienced by the interviewees in the implementation of teaching. Data were organized into categories (positive, negative) and subcategories (cooperation, feelings, learners, lesson preparation, lesson realization, personal issues, skills, support, time, technical aspects, etc.).

Analysing the responses to the question *How do you reflect on online learning?* we found out that the responses ranged from the spectrum of very problematic to manageable.

"At first I saw the transition to online teaching as a chance to learn something new, but the problem was that it was happening on the fly. Little time.....! It was necessary to completely overhaul my previous preparations for the classes and I already perceived this as a problem. Fortunately, my husband is IT, well versed in this area and he helped me a lot". I think I managed it at a pretty decent level". (R1) "I was constantly stressed. Even though I was responsibly adjusting my preparations to the online conditions I didn't trust myself. I was aware that my performance was actually public and parents could watch it live.....!. The responsibility was almost depressing. We were starting a lesson and I wasn't sure if I would be able to handle it technically, if my students would be able to connect and how many or if at all, how much the technology would be conducive to the realization of the learning objectives....!" (R2) "I

perceived it as a complication, a lot of changes in preparation, a brutal increase in administrative and organizational problems, when the teacher cannot devote himself to quality preparation for the next lesson, but has to sit at the computer..... I was happy to teach in a secondary school where the pupils are already much more independent. I think I have maintained the standard quality of teaching in spite of the conditions.....!" (R3) "I have coped. At times under a lot of stress, but after the first few days it was going quite well. At times it was almost fun in some subjects. I felt some shortcomings when communicating with the pupils. It was as if they did not realise that I had not invented this problem, this situation, this teaching, but that I wanted to help them to be active even in these complicated conditions....." (R4)

The second area of our interviews was devoted to reflection on the teaching phases of online teaching. We oriented the respondents' statements to the phases of the teaching process that were most problematic and the reasons that caused these problems. Again, responses in this area ranged from positive to very problematic.

"When explaining the curriculum, I had no opportunity to control how or if the pupils were cooperating with me at all. I often heard noises, noises that I could not define whether they were technical problems or whether it was the noise of the space in which the pupil was working." (R1) "The feedback phase was problematic for me. Not being able to see the pupil's eyes and not knowing if and to what extent they were cooperating was destructive to my performance. I read somewhere that if we don't see the pupil in the eye we only get half the information. Very often this caused me to lose concentration and not know how to help myself...." (R2)

The participant (R3) highlighted the preparatory phase of the teaching process, i.e. lesson planning, as problematic. *"The preparation for the teaching process was the most dramatic, especially in the first phase of online teaching. Little or no experience with online teaching caused concern at the beginning, but after that it was not a problem anymore."*

"I was also very worried at first about planning the teaching process and its implementation. The first two weeks I was so stressed that I carried these feelings into my own family. My survival was so intense that I thought about quitting my teaching job, resigning" (R4)

The positive aspects addressing cooperation, self-perception, effectivity were observed.

"I think the online teaching experience showed how we can work together within the school, respect each other and help each other....." (R1) "I had a positive experience during this period with my colleagues and the management. Especially the school management has been supportive." (R2) "... under such teaching conditions, I got to know myself, my capabilities and my limits, what I am able to endure everything.....!" (R4) "...online learning helped me focus on the core curriculum. I believe I focused more on the essential parts of the thematic units, I worked more effectively in class...!" (R3)

Concerning negative aspects they mainly mentioned they are not ready for teaching online, timing activities, dealing with technical issues, problems in communication with parents.

Although I have experience in teaching, preparing for online teaching in such a quick time sequence was very problematic. I needed much more time to prepare for teaching....." (R3)

"...professionally I felt dissatisfied, the technical problems in communicating with individual pupils were very disruptive to the flow of the lesson, many times we didn't even get to the solutions that how to solve it because the pace of the pupils is individual and you don't have more time.....". (R1). "There was a need to communicate with parents more often and communication with them was very problematic. Many of them were not interested in cooperating at all. There were times when I didn't know how to go on....." (R2) "Online teaching required a specific form of communication with the parents of the children.....only a tiny percentage of parents understood that without their help online teaching would be even more complicated." (R4) "I had trouble figuring out how many minutes the pupils were able to focus and concentrate, what breaks I should give so that the pupils would interact with me effectively...what to do, how to interact with pupils who didn't want to turn on the camera, I didn't know how to deal with that....." (R1) ".....I was forced to look for information in the field of psychology in preparation for the class..... I felt considerably unprepared in terms of the psychological laws of online teaching....." (R2)

With the widespread closure of schools and universities in the pandemic situation, many educators have had to quickly adapt to online learning methods, such as online classes, virtual lectures, and using different online applications.

The research aimed to assess the perceived stress levels of teachers and explore how their proficiency in using online tools, as well as the support from management/government, could impact these stress levels. The abrupt transition to a virtual environment presented new challenges and opportunities for teachers, students, and institutions as they navigated the intricacies of remote learning and the supporting technology.

The results indicated a significant influence of the ability to use online tools on the perceived stress levels of teachers. This finding aligns with similar conclusions in other research studies. Foreign studies, such as those by Antón-Sancho et al. (2022) and Vargas Rubilar & Oros (2021), consistently reported comparable results.

Surprisingly, our research revealed a relatively low skill level among the respondents in using technology, especially at the onset of the pandemic. Despite expectations that digital natives in the sample would evaluate their skills positively, and considering that many teachers undergo courses on technology use as part of their life-long education, the reported skill level was lower than anticipated (see fig. 5). This contrasts with findings from Winter et al. (2021), who reported a good level of skill in using various programs and apps among teachers in their sample. Such variations may be attributed to differences in educational philosophy, governmental priorities, and regional disparities.

Teaching is often described not only as challenging and rewarding but also as a stressful profession. High levels of stress can contribute to burnout syndrome and the teaching profession is generally said to be at risk for burnout. Stress symptoms were self-observed by the majority of respondents in the present research (see e.g. fig. 2) and similar results have been found also in other studies as e.g. Santamaría et al (2021), Ozamiz-Etxebarria, et al (2021), Pressley and Learn (2021). Based on both qualitative and quantitative data we have found that the support of school management significantly influences the teachers' behaviour (see fig. 9) and this finding is supported also by other research studies (McCarthy et al., 2022).

The primary focus of the analysis was to identify and highlight the challenges that teachers face in relation to online teaching, as well as to discuss broader issues encountered in their profession. Despite expressing complications in their statements, participants acknowledged the positive aspects that online learning has introduced and expressed intentions to incorporate them into their future teaching practices. Similar findings of the positive impact of the pandemic have been reported by researchers such as Godber & Atkins (2021) and Karakaya et al. (2021).

The influence of the pandemic on formal education has been substantial, with observable effects during the pandemic itself and anticipated long-term consequences. This impact extends beyond the adoption of technology, affecting the health and well-being of both teachers and students, their socialization abilities, communication, social interactions, and, importantly, their capacity for systematic learning.

Reflecting on the pandemic period, the teachers in the sample suggested several measures to prepare for similar situations and capitalize on the positive aspects experienced. These recommendations included ensuring access to technology and providing specialized training (as also noted by Ahmed, Opoku, 2022), offering management support, addressing health issues, fostering community engagement (in line with Haller & Novita, 2021), and developing online etiquette (consistent with Neuwirth et al., 2021).

Studying teacher stress, anxiety, and depression in the context of the Covid-19 situation is essential, but the current study may not provide a comprehensive evaluation of the results and consequences. Given the evolving nature of the Covid-19 situation, it is recommended that future studies on this topic be conducted to further explore and understand the challenges faced by teachers.

Limitations of the study

The sample size of 72 participants may not be representative, and as a result, the findings may not be generalizable. Furthermore, the study did not differentiate between depression, anxiety, and stress, despite enumerating several stress symptoms. The research methodology utilized convenient sampling, which can significantly influence data interpretation.

5 Conclusion

"Nearly 1.6 billion learners have been affected by school closures, representing more than 9 out of 10 enrolled students. This situation has also impacted over 63 million teachers, emphasizing the importance of building 'greater resilience in our education systems,' 'protecting education financing,' investing in high-quality initial teacher education, and continuing the professional development of the existing teacher workforce (Edwards et al., 2020, p. 14). Teachers, much like healthcare workers, often perceive their work as a mission rather than a job. They demonstrate a readiness to learn, a commitment to progress, and a willingness to work extra hours.

However, the stressful situation, increasing uncertainty, frustration stemming from the non-acceptance of their performance, lack of positive feedback, heavy workload, growing volume of administration, and the realization of additional activities like summer schools can lead to depression, stress, and even burnout. These challenges inevitably reflect on the quality of their work, the outcomes of education, and consequently, the overall teaching quality. Therefore, school management plays a crucial role in motivating teachers, distributing and organizing work effectively, offering appropriate training, and providing conditions for effective work.

Equally important is reflecting on the current situation, which we believe should positively influence the use of technology in teaching. This scenario naturally prompts changes in teacher training education, as it highlights that all teachers, not just modern ones, require digital skills as part of the essential 21st-century skills. It is the responsibility of universities to train teachers to use these skills effectively.

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