Study of the Causes of Teacher Burnout from the Use of Information and Communication Technologies, During the Period of Covid-19

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Abstract:

   Purpose – *The pandemic due to Covid-19 created an unprecedented situation worldwide and radically changed the social situation in people's life and work conditions. For education to function, the use of Information and Communication Technologies and new practices were adopted to build a new basis of communication between teachers and students. During the pandemic and in the phase of exclusion, teachers kept the educational process "alive and active" in the values of learning and school. Nevertheless, their huge effort also caused negative consequences for them. This specific study is a part of a work that concerns teachers' practical reports about their negative experiences using Information and Communication Technologies during the Covid-19 period.*

   Design/methodology/approach – *The study captures the causes of teachers' mental and physical Burnout due to the use of Information Systems, E-Learning, and Teleconferencing. Active teachers carried out the research, and its results concern public school teachers. The research methodology is part of the field of educational research and the analysis of the results through a structured online questionnaire.*

   Findings - *From the development of the research and the analysis of its results, it emerged that teachers during the period of confinement due to Covid-19 presented symptoms of work burnout with different symptoms according to categories of teachers.*

   Originality/value – *The findings of this research are unique in the Greek educational system and should improve the mechanisms to support teachers in performing their duties.*

   Index Terms — Covid-19, Burnout and Work Stress, Distance Education, Digital Educational Material, Information Systems, Electronic Classes – Teleconferencing.

I. INTRODUCTION

The sudden, violent, massive, and compulsory use of Information and Communication Technologies (ICT) through Distance Learning (DL) for all educational levels has become a new reality for both students and their guardians, as well as for Greek teachers [1]. By redefining the use of ICT in the pandemic phases, we find that the implementation of Distance Learning is supported through Internet services. In these virtual learning environments, students have online access to educational material and communicate with their teachers and peers through identified formats [2]. These environments, synchronous or asynchronous, were related to teaching and learning during the pandemic and functioned in a personalised way [3]. Teaching and pedagogical learning models (inside and outside the classroom), group practice, and group action principles moved to a new channel of knowledge transfer and communication [4]. In addition, teachers had to transfer online all their cognitive activities and assessments for Secondary Education like Gymnasium, General Lyceum, and Vocational Lyceum and First Level Education like Primary and Elementary Schools [5]. All acquired experiential educational activities, all models of learning performance, all evaluative learning tools, whether analogue or digital [6], and all provided school knowledge, together with curricula, were integrated into the context of online and technologically mediated learning [7].

Reflecting on the 2019-2020 and 2020-2021 school years (taking measures to address Covid- 19), no one can claim that the educational community, whether practising teachers (teachers, tutors, kindergarten teachers) or students, were prepared for this sudden change [8]. On the other hand, no one had anticipated the closure of schools, the complete individual isolation, and its psycho-spiritual consequences [9]. Nevertheless, the teachers' efforts to keep education "alive" were a catalyst for the whole society and for keeping hope alive. Throughout the pandemic, teachers willingly gave their best to promote the values of learning and schooling. They tried, without compromise and illusions, to synchronise themselves with the new situation, confirming the dictum of educational theorists, psychologists, and sociologists, who argue that "in gloomy times, thinking should keep us alive".

Considering the above, the present research was organised by teachers and referred to teachers. It focuses on the causes of mental and physical teachers' Burnout

due to the use of ICT (Information Systems, Electronic Classrooms, Teleconferencing, etc.) during the Covid-19 pandemic. The study results are relevant to all teachers, and the methodology is in the field of structured observations through a sampling of mental and physical burnout events.

The following parts of the article present an exposition of the principles of the survey design, a presentation of the instruments, a presentation of the results, and an interpretation of the data.

II. THE ORGANIZATION OF THE SURVEY

A. Aim and Objectives of the Research

This study aimed to investigate the causes that contributed to Burnout Symptoms (BS) among Greek teachers of primary and secondary education during the period of Covid-19. The research was oriented toward Burnout Symptoms due to the violent and forced transition from face-to-face to Distance Learning.

The research aims to investigate the following:

1) If the Greek educational system provided the mechanisms to support teachers in the performance of their duties during the pandemic and especially, to what extent did the state mechanism, contribute by providing the technological means and resources to support Distance Learning by supporting teachers' educational and administrative tasks through the use of ICT.

2) The degree of readiness and the possible difficulties the teachers had during the organisation of their distance teaching process.

3) How much did the abrupt, violent and forced implementation of Distance Learning affect teachers emotionally, psychologically, and physically?

B. Research Sample

The survey sample consisted of 194 Teachers, regardless of the employment relationship (permanent-substitute) and speciality, who work in public Pre-Primary and Primary Schools, Secondary Schools such as Junior High Schools and High Schools (General and Professional Education). The sample was collected in Athens and Piraeus area by sending anonymous questionnaires via an online cloud to the school directors. Some school directors, in turn, forwarded the link to the online cloud through the Panhellenic School Network (PSN) email and sent it to their school teachers' email addresses. Due to the restrictive measures against the spread of the Covid-19 virus, it was impossible to request formal permission to conduct the survey, resulting in difficulties approaching the sample of substitute teachers. For this reason, the questionnaire was also sent to teachers via social networking services.

C. Research Methodology

This specific research is part of the general field of educational research [10], but it also associates reports and contexts of other social fields. Beyond the particular situation's overview, the intended goals are the description of the context and causes of a social phenomenon (teachers' Burnout) and its interpretation. The approach of the fields is made through polls and sampling, which was organised based on the weighting and distribution of questionnaires. This method is accepted in the international literature on similar topics [11]. The sampling and collection of empirical research material were done with a specially designed, anonymous, online, and self-completed questionnaire. Despite the use of statistical tools, the main aim was not only the recording of statistical relationships but the attempt to interpret the data collected and the generalisation or formulation of the laws governing the specific research work case [12], [13].

The questionnaire includes two parts. The first part focuses on the social profile of the study sample, while the second part focuses on the causes of teachers' Burnout through ICT use during the Covid-19 period.

In more detail, the second part of the questionnaire contained **sixteen (16)** questions, which were composed based on the causes of the appearance of the teachers' burnout phenomenon as a result (causes – deficiencies) of the following:
- technological infrastructure,
- available networking,
- lack of digital learning resources,
- teacher-student support during the Distance Learning period,
- administrative support for teachers,
- e-services support,
- teacher-parent communication.

III. RESULTS

According to Figure 1, we observe that most divorced people agree to a large extent (31%), while widowers agree positively and at a rate of 50% that there is a private space in their home so that Distance Learning classes can be held. Married people also agreed in a large percentage (total 62%). In comparison, unmarried people in a large percentage (54%) expressed a low agreement that there is a particular space in their home to realise Distance Learning courses (Table I).

Table I. Family situation × My home has a private place to hold Distance Learning courses

	Low Agreement				High Agreement			TOTAL
	1	2	3	4	5	6	7	
Single	34%	10%	10%	11%	10%	10%	16%	100%

Married	14%	0%	10%	10%	5%	33%	38%	100%
Divorced	8%	23%	15%	8%	0%	27%	15%	100%
Widower/s	0%	25%	25%	0%	0%	0%	50%	100%
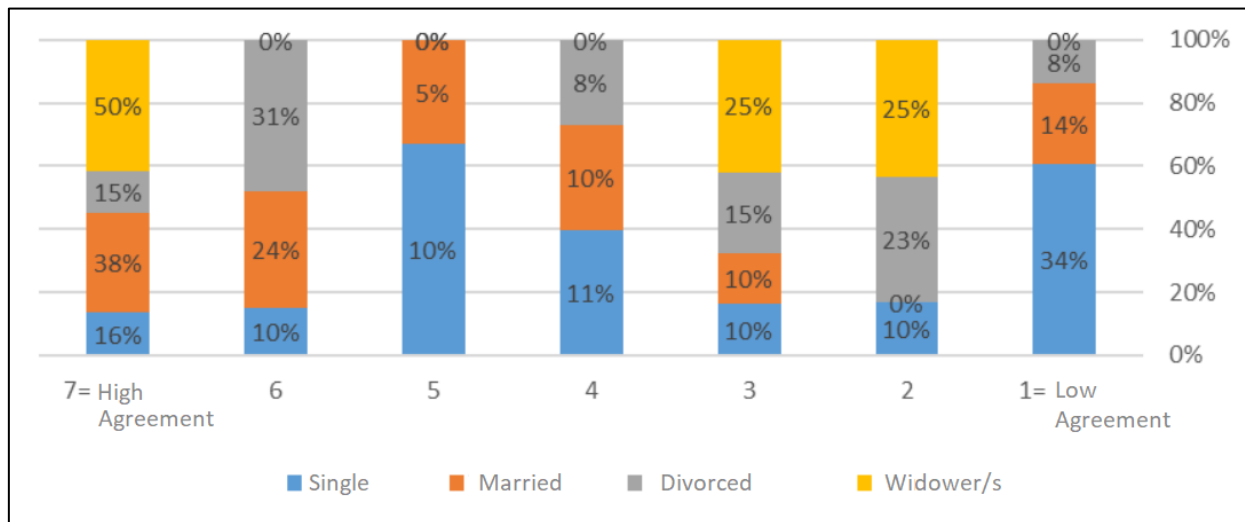
Fig. 1. The family situation concerning conditions at home

It can be said that the conditions under which Distance Learning courses take place at home do not depend on the teachers' family status (Table II).

Table II. Chi-Square Tests

X-Square test:	Price	BE	Asymptote. (2-booth)
Pearson X-Square	24,48	18	0,140
Likelihood ratio	28,00	18	0,062
Linear/on-linear correlation	4,10	1	0,043

According to Figure 2, half of the widows/ widowers (50%) agree positively that their home has the necessary equipment (machines and connection) for the coverage of Distance Learning. In contrast, the other half agree little or not at all with this fact. Less than half of singles (44%) do not agree that there is necessary equipment for Distance Learning in their home. On the contrary, more than half of married people, 52%, answered this question largely positively (Table III).

Table III. Family situation X in my home, I have the necessary equipment (machines and connection) to cover the Distance Learning courses

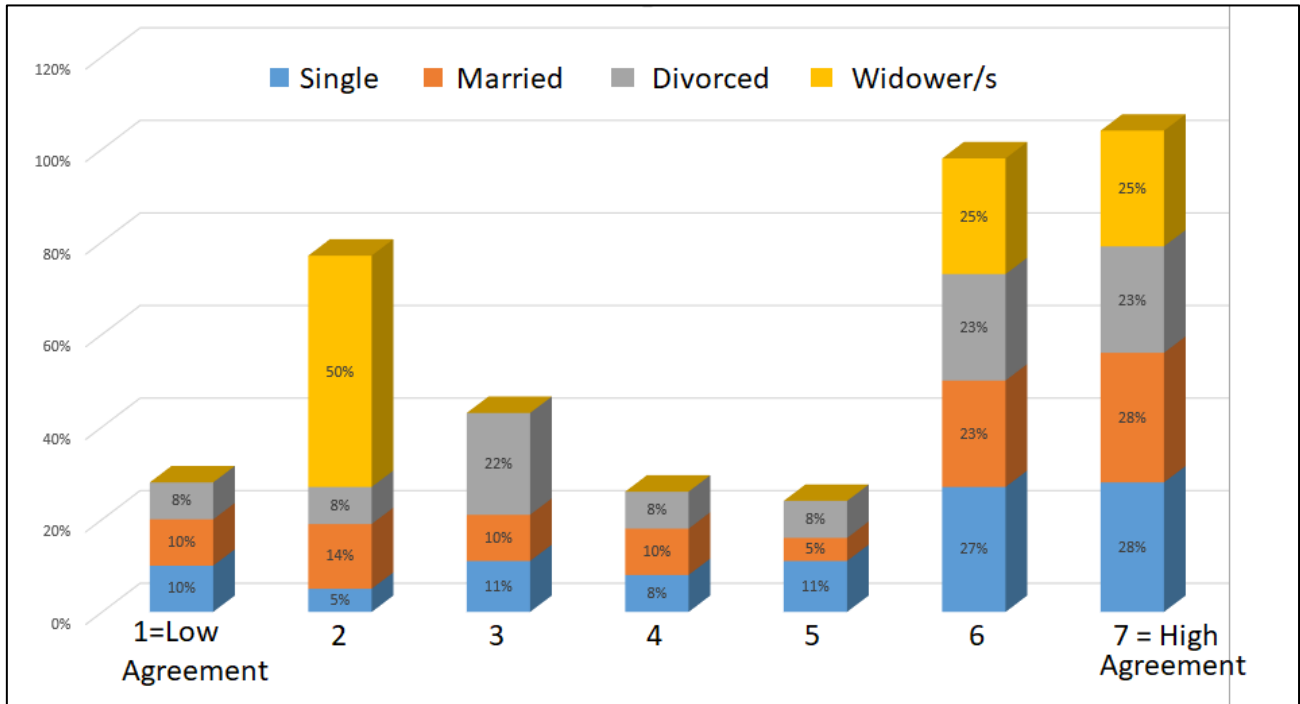|	Low Agreement					High Agreement		TOTAL
	1	**2**	**3**	**4**	**5**	**6**	**7**	
Single	10%	5%	11%	8%	11%	27%	28%	100%
Married	10%	14%	10%	10%	5%	23%	28%	100%
Divorced	8%	8%	22%	8%	8%	23%	23%	100%
Widower/s	0%	50%	0%	0%	0%	25%	25%	100%

Fig. 2. Family status and digital equipment to cover Distance Learning courses

In addition, the equipment used to cover Distance Learning does not depend on the marital status of teachers (Table IV).

Table IV. Chi-Square Tests

X-Square test:	Price	BE	Asymptote. (2-booth)
Pearson X-Square	13,49	18	0,762
Likelihood ratio	11,05	18	0,892
Linear/off-linear correlation	,84	1	0,358

From Figure 3, we observe that holders of a second degree agree much more than the rest (at a percentage of 75%) with the Burnout caused by the compilation of digital material in their course preparation. They are followed by teachers who did not continue their studies (at a rate of 63%). Masters or PhD holders are much less in agreement (at a rate of 57-59%), while for post-doctorates, there is moderate agreement (Table V).

Table V. Extra Studies × Compiling digital material for my Distance Learning course brought me to the brink of Burnout as I had to consume many hours

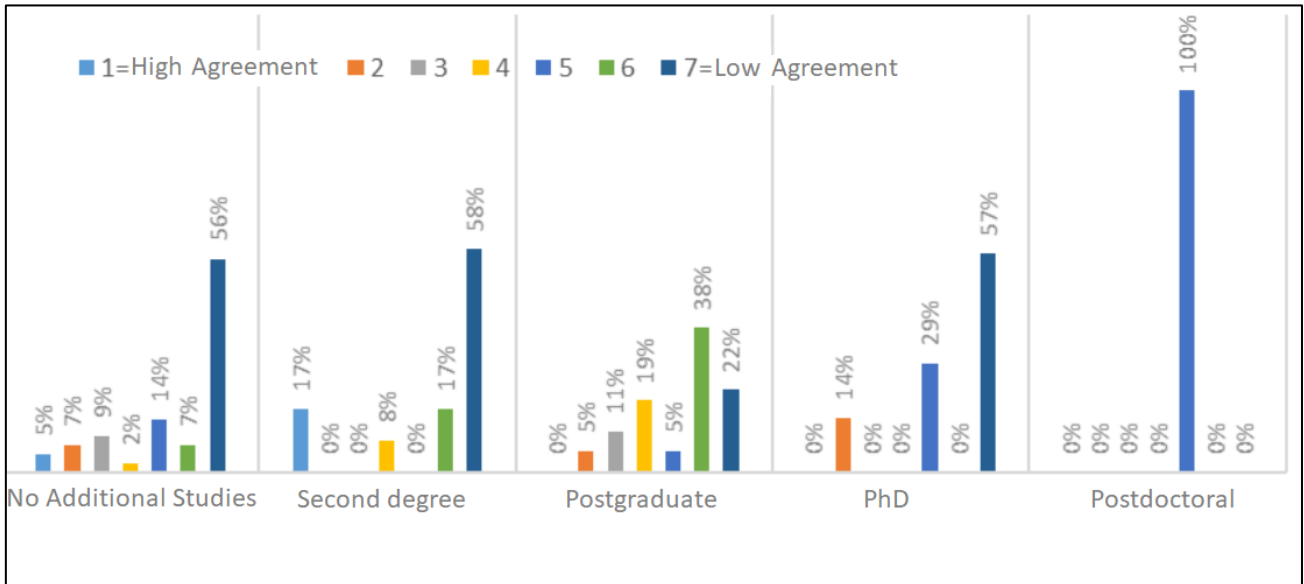|	minor agreement				great deal			TOTAL
	1	**2**	**3**	**4**	**5**	**6**	**7**	
No Additional Studies	5%	7%	9%	2%	14%	7%	56%	100%
Second degree	17%	0%	0%	8%	0%	17%	58%	100%
Postgraduate	0%	5%	11%	19%	5%	38%	22%	100%
PhD	0%	14%	0%	0%	29%	0%	57%	100%
Postdoctoral	0%	0%	0%	0%	100%	0%	0%	100%

Fig. 3. Extra studies and Burnout from creating digital material

From the Pearson table, we can say that the level of teachers' education is related to the amount of Burnout from assembling the digital material necessary for Distance Learning (Table VI).

Table VI. Results of Chi-Square Tests

X-Square test:	Price	BE	Asymptote. (2-booth)
Pearson X-Square	47,89	24	0,003
Likelihood ratio	48,75	24	0,002
Linear/off-linear correlation	,32	1	0,573

According to Figure 3, we observe that the majority of teachers (over 60%) reported Burnout caused by the assembly of digital materials while they prepare their distance courses. Teachers who did not have ICT certification agreed greatly on this Burnout (47%). Teachers with B-level ICT certification also reported Burnout to a great extent at 42% and A-level ICT holders at 40% (Table VII).

Table VII. ICT training x Creating digital material for my course brought me to the brink of Burnout as I had to consume many hours

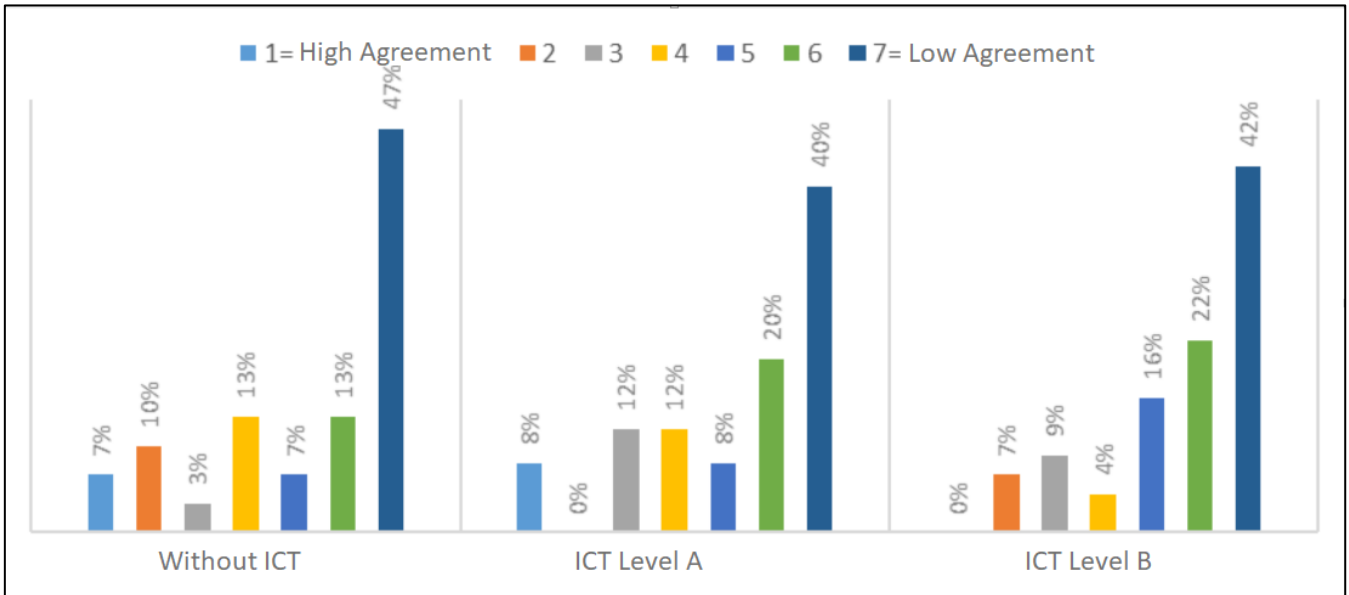|	minor agreement				great deal			TOTAL
	1	2	3	4	5	6	7	
Without ICT	7%	10%	3%	13%	7%	13%	47%	100%
Level A	8%	0%	12%	12%	8%	20%	40%	100%
Level B	0%	7%	9%	4%	16%	22%	42%	100%

Fig. 4. ICT training and Burnout from creating digital material for Distance Learning courses

Moreover, we can say that the additional work teachers have done is not related to their Burnout from long hours of computer and digital application use (Table VIII).

Table VIII. Chi-Square Tests

X-Square test:	Price	BE	Asymptote. (2-booth)
Pearson X-Square	36,20	24	0,053
Likelihood ratio	27,24	24	0,293
Linear/off-linear correlation	1,40	1	0,238

According to Figure 4, we observe that all teachers, regardless of whether they have certification or not, agree to a very large extent (a percentage greater than 60%) that they found themselves at the limits of their endurance due to long hours of computer use. A small percentage of 13-14% without B level ICT certification report that they did not reach the limits of their endurance from long hours of computer use, while holders of B Level ICT certification in a double percentage (24-26%) also report that they have not reached the limits of their endurance from long hours of PC use (Table IX). Moreover, teachers' ICT training is not related to their Burnout from long hours of computer use (Table X).

Table IX. ICT training × I feel that I am at the limits of my endurance from the long hours ofcomputer use

	minor agreement				great deal			TOTAL
	1	2	3	4	5	6	7	
Without ICT	10%	0%	3%	17%	7%	13%	50%	100%
ICT Level A	0%	4%	8%	20%	8%	28%	32%	100%
ICT Level B	0%	13%	11%	2%	9%	22%	42%	100%

Table X. Chi-Square Tests

X-Square test:	Price	BE	Asymptote. (2-booth)
Pearson X-Square	21,85	12	0,039
Likelihood ratio	25,02	12	0,015
Linear/off-linear correlation	0,03	1	0,858

From Figure 5, we observe that more than half of the teachers with less than 10 years of experience take 2-4 hours on average to prepare for their Distance Learning courses. 29% of early-employed teachers need 4- 6 hours of preparation, while 22% of older teachers (with 6-10 years of experience) need 3-4 hours of preparation for their Distance Learning courses. More than 10 years experienced, teachers need less preparation - as reported - than the rest (half of them require less than 3 hours of preparation), while 12% of teachers with more than 16 years of experience said that they get prepared in less than 1 hour for their Distance Learning courses (Table XI).

Table XI. Years of service × To be able to prepare for Distance Learning courses, I dedicated every day over

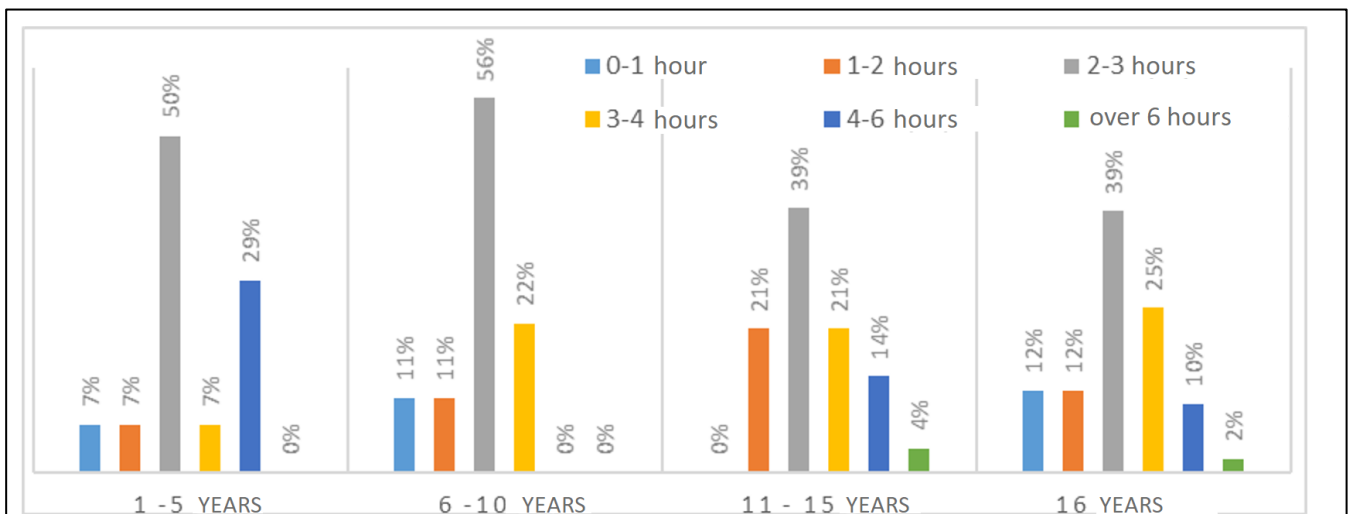|	HOURS OF PREPARATION						
	0-1 time	1-2 hours	2-3 hours	3-4 hours	4-6 hours	> 6 hours	TOTAL
1 -5 years	7%	7%	50%	7%	29%	0%	100%
6 -10 years	11%	11%	56%	22%	0%	0%	100%
11 – 15 years	0%	21%	39%	21%	14%	4%	100%
16 and	12%	12%	39%	25%	10%	2%	100%

Fig. 5. Years of service and Burnout from daily preparation for Distance Learning courses

From the Pearson table, we can conclude that the teachers' seniority time is not related to their Burnout from daily preparation for DE lessons (Table XII).

Table XII. Chi-square test

X-Square test:	Price	BE	Asymptote. (2-booth)
Pearson X-Square	12,47	15	,643
Likelihood ratio	15,80	15	,396
Linear/off-linear correlation	31	1	,581

According to Figure 6, we observe that regardless of their level of study, 40% of teachers (except for postdocs) agree that Distance Learning courses need 2 to 3 hours of preparation. 17%-28% of teachers report that they agree

on a Distance Learning preparation of 3 to 4 hours, and a percentage of 18%-27% of teachers, regardless of their level of study, agree on a Distance Learning preparation in less than 2 hours. Among teachers with a postgraduate degree, a percentage of 13% seem to agree that it takes 4-6 hours to prepare for a Distance Learning course (Table XIII).

Table XIII Extra Studies × To be able to prepare for the Distance Learning courses, I dedicated every day

| | HOURS OF PREPARATION | | | | | | |
	0-1 time	1-2 hours	2-3 hours	3-4 hours	4-6 hours	> 6 hours	TOTAL
No Additional Studies	5%	19%	35%	28%	14%	0%	100%
Second degree	8%	8%	50%	25%	8%	0%	100%
Postgraduate	11%	11%	51%	14%	8%	5%	100%
PhD	0%	14%	29%	14%	43%	0%	100%
Postdoctoral	100%	0%	0%	0%	0%	0%	100%
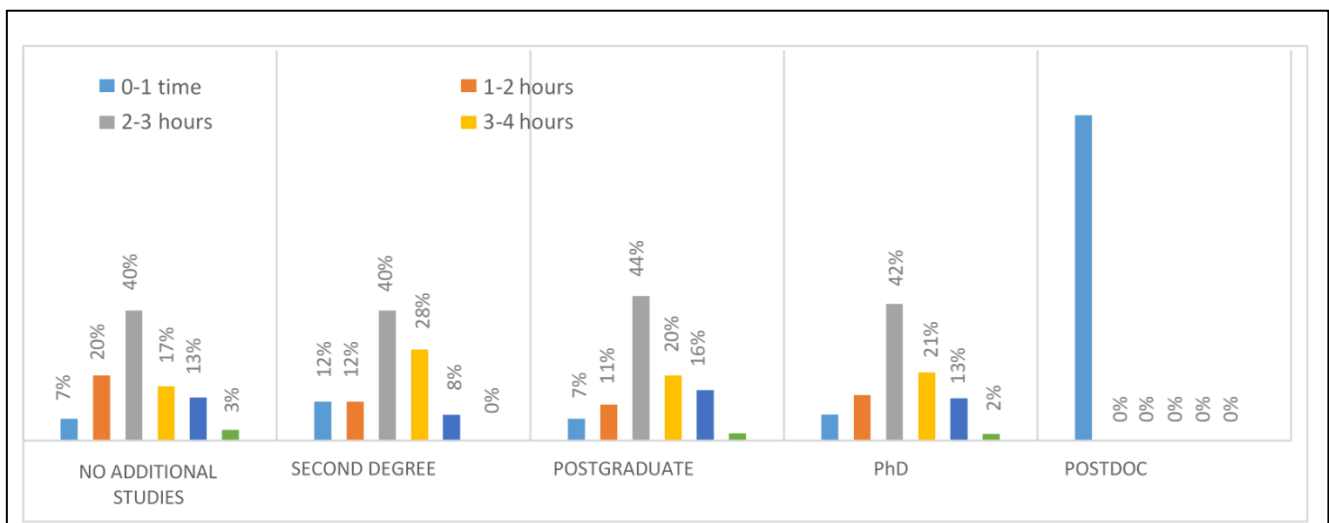
Fig. 6. Extra studies and Burnout from the daily Distance Learning preparation

We can say that the extra studies that teachers have done and their Burnout from the daily Distance Learning preparation are not dependent (Table XIV).

Table XIV. Chi-square test

X-Square test:	Price	BE	Asymptote. (2-booth)
Pearson X-Square	27,30	20	0,127
Likelihood ratio	20,43	20	0,431
Linear/off-linear correlation	0,08	1	0,776

IV. CONCLUSION

The importance of the research lies in the fact that it highlights the causes and the problems that Greek teachers faced for the first time due to Distance Learning during the Covid-19 quarantine period. It captures the phenomena of professional Burnout in teachers of all levels but also in education executives such as Principals, Vice-Principals, and Supervisors, where, in addition to planning their Distance Learning courses, they shouldered the burden of the administrative tasks of closed schools.

Based on the survey, it was found that teachers in Greece not only did not have the skills but were not sufficiently trained to cope with the demands of Distance Learning, apart from the last months of the 2020 – 2021 school terms (https://t4e.sch.gr/), through a rapid online training.

According to the results of the questionnaire, Greek teachers consider that overall, the Greek educational system was not prepared, nor did it have mechanisms to support the educational process. The state did not properly prepare the infrastructure or those mechanisms

that would help teachers to cope with their teaching and service tasks. Apart from the electronic classrooms and the compulsory modern teaching system, the Greek educational system has not structured the necessary technological-digital resources to support E-Learning. Furthermore, the digital infrastructure of education has not been further upgraded except for the purchase of a limited period of software or web platform for the implementation of E-Learning. The above resulted in transferring all responsibilities and organisational obligations of the educational process during the Covid-19 quarantine period to Greek teachers.

In addition, most teachers stated that they were led to Burnout due to the long hours of computer use to respond to the multifaceted tasks of preparing their e-learning materials for their Distance Learning courses and administrative duties.

During the quarantine, teachers rose to the occasion and took full responsibility for the organisation of Distance Learning. They fully covered the equipment cost for their e-courses, and finally, carried out their distance teaching and administrative duties as efficiently as possible. A significant finding was that teachers supported their students and their families in every possible way during the pandemic. This specific finding demonstrates the extent of the empathy of the teachers who helped practically and essentially in social cohesion, setting a valuable legacy for the educational future of their country.

The involvement of teachers in all the aforementioned processes, namely the continuous ICT use and E-Learning, as well as their repeated administrative reassignments due to the new working data that emerged, resulted in their Burnout. The specific findings concerning the imposition of Distance Learning as the only means of education during the pandemic period make this study even more important. The reason is that these findings will be used in future research to measure whether Greek teachers will continue, even after the end of the Covid-19 pandemic, to implement digital media and the operation of electronic classrooms in lifelong education.

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