



Professional and psychological precursors of instructional approaches used in distance learning during COVID-19

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Abstract

The current study addresses two antecedents that may serve to explain teachers' online instructional practices during the COVID-19 pandemic: first, the professional aspect that deals with suitable training of teachers and school support for distance learning, and second, informed by the professional aspect, the personal (psychological) aspect that discusses the self-efficacy and attitudes of teachers toward distance learning. A mixed-methods design was employed by collecting data from 327 Israeli schoolteachers. A phenomenological paradigm was used to enrich the information from the point of view of teachers who experienced the transition to distance learning. The empirical model included three aspects connected to distance learning: the professional, personal (psychological), and pedagogical-practical. The professional level included training and school support for distance learning. The personal level referred to teachers' perception of their efficacy to use technology for distance learning and their attitudes toward incorporating technology in teaching. The practical aspect comprised actual teaching methods that teachers used during distance learning. The results of the quantitative data analysis revealed that teachers' perceived efficacy to deploy competency-based learning strategies exceeded their actual use of such activities during the crisis. In practice, they maintained classroom discipline rather than enhancing collaborative practices, according to their report. The current study indicates that teachers' perceived ability to deploy distance learning activities might play a central role in explaining actual online instructional activities used during the crisis. This psychological aspect can be nurtured by appropriate professional training and technical and emotional support. Based on both quantitative and qualitative analyses, appropriate preparations are suggested to provide teachers with technical, pedagogical, and emotional support during times of crisis.

Keywords Distance learning · Distance learning professional development · Distance learning efficacy · Distance learning practices during COVID-19

Introduction

The COVID-19 pandemic disrupted people's lives throughout the world, causing educational systems to close. Schools were compelled to make a transition to distance learning to ensure uninterrupted education for students who were not permitted to physically attend school. The continuation of the crisis created a challenge for the educational system. Reports that were compiled in the wake of the new situation

testified that the educational system was unprepared to deal with rapid changes in teaching methods in Israel and throughout the world (Marshall & Wolanskyj-Spinner, 2020; OECD, 2020; Sintema, 2020). One of the main problems created due to continuous distance learning was teachers' inability to conduct distance learning based on the principle of lifelong learning that emphasizes developing skills (Burgess & Sievertsen, 2020; Valverde-Berrocoso et al., 2021).

The current study addresses two aspects that may serve to explain this failure: first, the professional aspect that deals with suitable training of teachers and school support for distance learning, and second, informed by the professional aspect, the personal (psychological) aspect that discusses the efficacy and attitudes of teachers toward distance learning. These aspects are considered valuable in moving teachers toward integrating technology into

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their constructivist teaching practices (Alt, 2018; Miller et al., 2017). Based on previous studies, Professional Development (PD) programs might spur teachers' confidence to design technology-enabled teaching-learning practices, and their efficacy to integrate technology into their teaching practices (Koh et al., 2016; Moreira et al., 2019; Scully et al., 2021; Tondeur et al., 2021; Valverde-Berrocoso et al., 2021; Vongkulluksn et al., 2018). Moreover, such programs may facilitate a change in teachers' attitudes toward the implementation of technology-enabled practices (González-Sanmamed et al., 2017; Guillén-Gámez & Mayorga-Fernández, 2020). Consequently, teachers who believe in their ability to effectively use technology in their teaching practices may hold positive attitudes toward distance learning (Ismail et al., 2020). These variables might affect the way teachers use technology-supported education in their classes (Baş et al., 2016; Moreira-Fontán et al., 2019; Semerci & Aydin, 2018; Wasserman & Migdal, 2019; Yesilyurt et al., 2016).

A mixed-methods research design was employed for this purpose to empirically assess the relationships between these factors by collecting data from a sample of teachers using quantitative tools. In addition, a phenomenological paradigm was used to enrich the information from the point of view of teachers who experienced the transition to distance learning. This research design may provide an in-depth picture of the phenomenon under study (Creswell, 2015).

Based on its findings, this study will shed light on the understanding of the crisis from the teachers' point of view and will include recommendations that can be implemented during crisis situations in the future. This study may inform key stakeholders with insights regarding teachers' professional and personal aspects connected to the application of pedagogical activities in distance learning during the COVID -19 period.

Theoretical Review

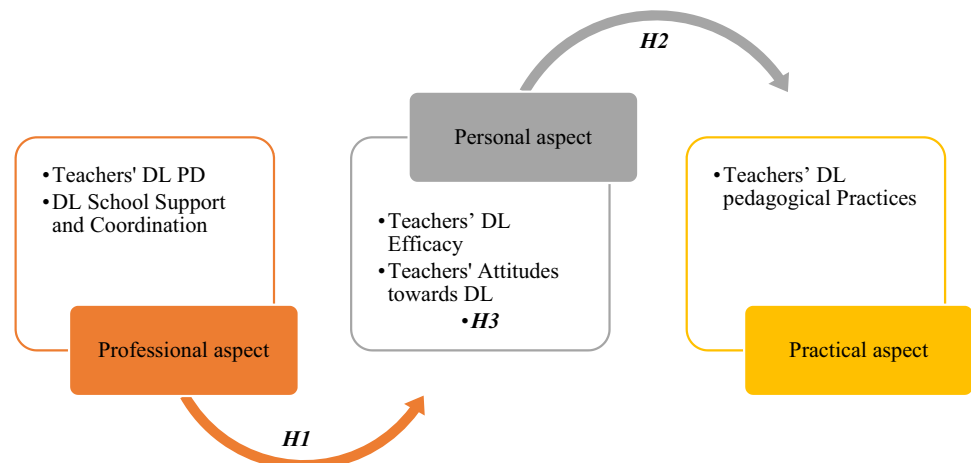
The following review is structured in line with the objectives set for this research (as illustrated in Fig. 1), and includes three sections: the first, refers to the *professional aspect*, including technological training for distance learning and school support needed for teachers before and during distance learning; the second, is the *personal aspect* comprising teachers' efficacy and attitudes toward distance learning; the third is the *practical aspect* - delineating the teaching methods practiced by teachers during the pandemic.

The Professional Aspect: Technological Training for Distance Learning and School Support

The transition to distance learning, brought about by the need for social distancing due to the COVID-19 pandemic, forced the educational system to implement numerous pedagogical, administrative, and organizational changes. The most pronounced of these was the need to transfer a large part of teaching and learning to online platforms within a short period of time (OECD, 2020). However, online teaching will have long-term professional repercussions. Teachers' professional status will be enhanced if they continue to utilize the knowledge, understanding, and technological skills that they acquired after the crisis is over, and their professional empowerment will continue to be tested over time (Yeap et al., 2021).

This empowerment also stems from the quality of professional training that teachers receive. In a report following a workshop on training teachers for online teaching (Israeli Ministry of Education, 2020), five principles for professional training for teachers in a digital environment were formulated: (1) Enhancing techno-pedagogical skills; (2) developing technological and techno-pedagogical teaching methods aimed at providing equal opportunities for

Fig. 1 Model 1. The theoretical structure of the proposed framework with hypothesis indications



learning and evaluation for heterogeneous classes; (3) relating to teachers' beliefs and attitudes toward incorporating technology in teaching and evaluating them at the first stage of training in online teaching (Dovbenko et al., 2020); (4) creating a model for training and professional development that combines various teaching approaches; and (5) relating to the social and emotional aspects that accompany online teaching.

The small number of studies that were conducted about teachers' training during the COVID-19 crisis mainly emphasized the technological aspects of the training processes. For example, Shamir et al. (2020) assessed the empowerment of 711 teachers in their use of a technological tool kit during COVID-19. They examined how laptop computers or iPads enabled them to adapt to the challenge of distance teaching, continue their teaching routine, and maintain contact with their students. The participants drew a connection between teachers' command of digital tools and improvement in the quality of teaching and communication. Their findings led the researchers to emphasize that it was important for teachers to acquire laptop computers and iPads for distance learning during the COVID-19 pandemic together with appropriate training.

According to previous studies published before the pandemic spread, many in-service teachers perceive themselves as having poor technological skills, and Professional Development (PD) programs do not adequately meet their needs and offer only general skill training (Liu et al., 2015). As pointed out by Koh et al. (2016), PD processes are linked to teachers' confidence to design technology-enabled teaching-learning practices. PD also seems to be linked to teachers' efficacy to integrate technology into their teaching practices. This notion was also strengthened by Alt (2018) who investigated science teachers' conceptions of traditional versus constructivist teaching and learning, Information and Communication Technologies (ICT) PD enhanced teachers' ICT efficacy and ICT use in their science classroom.

ICT support is not only important as a condition for the successful implementation of distance learning but also needs to be understood as a form of pedagogical support for teachers when required to integrate ICT into their distance learning practices (Tondeur et al., 2021). In this context, the ICT coordinator's role and responsibility are tremendous but need to be supported by the school leadership and teacher colleagues (Moreira et al., 2019). Vongkulluksn et al. (2018) asserted that school administrators influence teachers' intentions to apply technology in the classroom, as they are responsible for planning, implementing, monitoring, and supporting the integration of ICT in school and the curriculum. Similarly, Scully et al. (2021) contended that school leaders can influence the level of technology use in the classroom and stressed the need for more "professional learning opportunities focused on pedagogic aspects of digital

competence" (p. 179) following the COVID-19 pandemic. Others (Valverde-Berrocoso et al., 2021) also emphasized the role of the ICT coordinators in training teachers to integrate technologies into teaching practices and adequately develop their digital competence.

The Personal Aspect: Teachers' Distance Learning Efficacy

One of the key concepts associated with openness to new teaching methods when facing challenges (Pressley et al., 2018) is self-efficacy, defined as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1994, p. 71). According to previous studies (Moreira-Fontán et al., 2019; Yesilyurt et al., 2016), teachers must have high levels of academic and digital self-efficacy in order to apply technology-supported education. Those possessing strong self-efficacy are more open, responsive, and experimental, and therefore, provide a positive learning environment for their students.

Merely limited research on teachers' efficacy concerning DL during COVID-19 is available thus far. For example, Pressley and Ha (2021) assessed how the new teaching approaches required of teachers during COVID-19 have impacted their self-efficacy, specifically instructional and engagement efficacy. Their sample included 361 teachers from across the United States. According to their study, teachers' self-efficacy scores were lower than scores found in the pre-pandemic studies. More specifically, teachers who used DL approaches had the lowest efficacy scores compared to teachers teaching in other models, such as a hybrid or all in-person models. This trajectory was explained by other researchers, claiming that the different levels of self-efficacy can be hinged on previous experience with online courses (Dolighan & Owen, 2021); and on the level of the perceived difficulty in providing distance learning – decreased levels of self-efficacy was observed when teachers faced more difficulty with this teaching method (Rabaglietti et al., 2021). It should be noted that these studies on teacher efficacy during the COVID-19 were mainly cross-sectional.

Previous studies (Miller et al., 2017) showed how teachers' efficacy beliefs relate to their actual teaching, investment in teaching, and the goals they set. Yesilyurt et al. (2016) who investigated computer-supported education maintained that it is necessary for teachers to have high levels of academic self-efficacy and computer self-efficacy in order to use and apply computer-supported education. Another study by Moreira-Fontán et al. (2019), who studied 350 in-service secondary school teachers, found that those who perceived themselves as possessing higher levels of ICT self-efficacy and received support, experienced more ICT positive emotions and satisfaction with school

support and were the most autonomously motivated and engaged in their work. Similarly, Pressley and Ha (2021) contended that teacher self-efficacy can be enhanced by PD including mastery experiences and verbal persuasion. These aspects should reflect success experiences in the classroom and constructive feedback provided by observations. Yet, they noted, the usage of mastery experiences might not yield the expected results, when teachers struggle with new challenges, as in such situations teachers tend to reevaluate their teaching abilities which might hamper their self-efficacy.

The Personal Aspect: Teachers' Attitudes toward Distance Learning

Baş et al. (2016) determined that for successful transformation in educational practice, teachers need to develop positive attitudes toward innovation. Teachers' positive attitudes toward the use of educational technology might ease the adoption and integration of ICTs into the teaching and learning process. These attitudes, they claimed, might be shaped by previous computer experience and training, the more experience teachers have with computers, the more likely that they will show positive attitudes toward ICT.

In a similar vein, to facilitate change in attitudes, researchers (González-Sanmamed et al., 2017; Guillén-Gámez & Mayorga-Fernández, 2020; Semerci & Aydin, 2018; Wasserman & Migdal, 2019), who investigated teachers' attitudes toward ICT, concluded that it is necessary to develop teacher practical ICT training programs that promote and facilitate effective ICT integration in the classroom. De la Rama et al. (2020) suggested conducting seminars on virtual teaching covering topics related, for example, to development, operations, delivery, maintenance, and security. Such training sessions should include technical staff aimed at assisting teachers in implementing ICT tools in their teaching practices. In addition, educational leaders may guide and train teachers on how to convert their instructional materials to a digital format.

Recently, Jomezai et al. (2021) assessed teachers' attitudes concerning the effects of physical distancing during COVID-19 period and increased social media (SM) use, more specifically, they explored how physical distancing amid the pandemic has influenced teachers' attitudes to opt for social media use in online learning. Their findings showed that the increased SM use during that time has positively affected teachers' attitudes toward SM use in online learning. Their attitudes toward SM use in online learning were informed by their increased knowledge of SM use and their meaningful engagement with SM. This knowledge can be enhanced through developing networks and peer collaboration and knowledge sharing in an online community (Limaye et al., 2020).

Ismail et al. (2020) suggested providing more school-level support to help teachers use SM to scaffold students' learning needs. Similarly, DeCoito and Estaiteyeh (2022) explored STEM teachers' views of and attitudes toward online teaching during the COVID-19 pandemic period. According to their findings, teachers faced challenges that negatively affected their attitudes and views toward online teaching. The support they received did not meet their expectations. Teachers' experiences, self-efficacy, and technological competency slightly increased their attitudes toward online teaching. Effective professional development programs are suggested to support and facilitate teachers' transition to online teaching and enhance their attitudes toward it.

The Practical Aspect: Teaching Methods in Distance Learning during the Pandemic

During the pandemic, the Israeli Ministry of Education's report (2021) determined that the quality of teaching is more important than the technological platform through which it is implemented. According to the report, quality teaching includes, among other things, building learning scaffolds and providing feedback, and it can exist in a significant manner remotely as well. This implies that teachers' ability to implement pedagogy, directed at developing twenty-first-century cognitive and social-emotional skills, is the principal topic in reports of the Ministry of Education published during the period of COVID-19. The central role of these skills increased during the pandemic when students were required to demonstrate additional skills as well as to deepen existing ones (Berger-Tykoczynski et al., 2020). Consequently, it is necessary to examine the assimilation of technological tools for changing teaching methods and the efficiency of distance learning for attaining the objectives that confront the educational system.

The period of the pandemic made it necessary to actually create an immense variety of approaches, lesson plans, and unique teaching methods (Danchikov et al., 2021). Creating an interest in learning is likely to encourage students to participate in the learning effort, but in order to accomplish this, teachers need to demonstrate professional ability above and beyond emphasizing classroom discipline. This professionalism is measured by the teacher's ability to develop constructivist learning environments using technology. Teachers will need to become facilitators who help their students acquire knowledge and lifelong learning skills (Maatuk et al., 2021).

However, empirical studies have shown that the potential within the reality of COVID-19 that was described above was not realized. Several studies (Arora & Srinivasan, 2020; Onyema et al., 2020) pointed mainly to the failure of technology-supported pedagogy to develop students' cognitive and emotional skills. For example, in a study conducted

among teachers who practiced distance learning (Arora & Srinivasan, 2020), the researchers claimed that many students experienced cognitive difficulties. These difficulties were attributed to ineffective teaching practices of distance learning that failed to nurture various literacy skills. In other words, when distance learning is not properly implemented in a manner that is suitable to the students, they are unable to assimilate the learning material in an optimal manner. When students absorb the learning material only partially, they fail to develop the various cognitive abilities that accompany literacy, usually materialized during face-to-face learning.

Another study conducted by Onyema et al. (2020) indicated that there is evidence that certain schools attempted to take advantage of the period of COVID-19 in order to foster students' problem-solving abilities through distance learning. This was done mainly by conducting theoretical discussions, presenting difficulties, and brainstorming using the Zoom application. These schools viewed the COVID-19 pandemic as an opportunity to reassess their teaching methods. However, the findings did not reveal unequivocal results regarding the success of the experiment – i.e., improvement in students' problem-solving abilities.

The Current Study

The review of literature presented in this study reflects three main focal points for teachers during the COVID-19 pandemic:

1. The professional aspect: technological training for distance learning and support.
2. The personal aspect: Efficacy and attitudes toward distance learning.
3. The practical aspect: Teaching methods in distance learning.

This mixed-methods research combined elements of qualitative and quantitative research approaches for the purposes of breadth and depth of understanding the phenomenon.

This study attempted to empirically assess the relationships between these factors by collecting data from a broad sample of teachers using quantitative tools. This study employed the approach to qualitative research to explore the enabling and inhibiting factors connected to distance learning from teachers' points of view. This was done according to the phenomenological paradigm that attempts to clarify the significance of social phenomena as reflected by those who experience them (Heidegger, 2005; van Manen & van Manen, 2021).

The Quantitative Study

The current quantitative study sought to examine the connections between three identified aspects presented in the

literature review: (1) *Professional aspect*, including teachers' distance learning (DL) professional development, and DL school technical support and coordination offered to them by the school; (2) *personal aspect*, including teachers' attitudes toward DL, and their perceived DL self-efficacy; (3) *practical aspect* - teachers' actual DL practices during the COVID-19 crisis. In line with the literature review, the following hypotheses were tested:

(H1) Based on previous studies (e.g., González-Sanmamed et al., 2017; Koh et al., 2016; Tondeur et al., 2021), the professional aspect (including teachers' DL professional development, and DL technical support and coordination) will be positively connected to the personal aspect (i.e., teachers' attitudes toward DL, and their perceived DL self-efficacy).

(H2) In line with past work (e.g., Yesilyurt et al., 2016), the personal aspect (including teachers' attitudes toward DL, and their perceived DL self-efficacy) will be positively connected to teachers' DL practices.

(H3) Based on current findings (DeCoito & Estaiteyeh, 2022) within the personal aspect, teachers' positive attitudes toward DL will be positively informed by their DL self-efficacy.

Background variables such as age and seniority levels will be addressed to examine how they may intersect with the examined constructs. Model 1 (Fig. 1) is a path diagram illustrating the theoretical structure of the proposed framework with hypothesis indications.

Method

Participants

COVID-19 spread in Israel in March 2020, led to several restrictions and frequent total closures, thrusting the education system into e-learning until March 2021. The questionnaires in the present study were distributed to teachers during the closures when students and teachers could not attend classes. The questionnaires were distributed by a link to teachers' communities and forums around the country and enabled a voluntary, anonymous response. This is a non-probability sampling design where the final sample is selected from the potential respondents who are willing to participate in the study (Murairwa, 2015). Data were gathered from 327 teachers from Israeli Jewish public schools (94% female teachers), of whom 56% were primary school teachers and 44% middle/ high school teachers. Most of the participants were teachers of the humanities (37%), 22% were mathematics teachers, 12% were science teachers, and 29% of other disciplines. The seniority level (years spent

in practice) mean result of the teachers was 13.92 years ($SD=9.84$). The most frequent age category reported by the participants was 41–50 years (33%). Concerning educational attainment (EA), 44% reported having a bachelor's degree, 55% master's degree, and 1% Ph.D. degree. Most of the teachers reported the highest frequency category used in the scale (*almost always*) to depict their personal computer use for teaching purposes before the COVID-19 period (36%), and frequently taught 1–2 distance lessons a day during this period. The participants have volunteered to fill out the online questionnaire. It was specified that the questionnaires were anonymous, and the participants were assured that no specific identifying information about the schools would be required or processed. The study was preauthorized by the college *Ethics Committee*.

Instrumentation

Teachers' DL Professional Development Scale This 4-item scale (Vanderlinde & van Braak, 2010) was initially designed to assess teacher engagement in professional development (PD) activities related to ICT integration into the curriculum and was adapted in the current study to DL PD. The teachers were asked to report their level of agreement with the statements: "I attend frequently in-service teacher training about the educational use of DL"; "I try to keep informed about everything that has to do with DL in education"; "I take initiative to learn about everything that has to do with DL in education"; and "I attend frequently technical DL in-service teacher training courses". A 6-point Likert-style format was used ranging from 1 = *completely disagree* to 6 = *completely agree* ($\alpha = .70$).

DL School Support and Coordination Scale This scale was constructed by Vanderlinde and van Braak (2010) to capture the level of ICT support teachers get from their schools. For the purposes of the current study, this 7-item scale was adapted to DL support. The teachers were asked to report their level of agreement with statements such as: "In our school, we can receive technical support during DL". A 6-point Likert-style format was used ranging from 1 = *completely disagree* to 6 = *completely agree* ($\alpha = .90$).

Teachers' DL Efficacy This 18-item scale was based on Robinia and Anderson's (2010) teacher efficacy scale, including three factors: (a) efficacy in instructional strategies (b) efficacy in student engagement; and (c) efficacy in classroom management. Factors a and b demonstrate student-centered approaches, whereas factor c reflects teacher-centered approaches. As the focus of the original scale was on nurse educators in higher education settings, the currently used instrument was revised to address schoolteachers' self-efficacy for online teaching. The teachers were asked to report

their level of agreement with statements concerning DL such as: "I am able to control unworthy behavior in an online environment", or "I can transfer specific learning subject to distance learning lesson". A 6-point Likert-style format was used ranging from 1 = *completely disagree* to 6 = *completely agree*.

Structural equation modeling (SEM) was employed to assess the construct validity of the scale, using confirmatory factor analysis. Data used for the SEM were analyzed with the maximum likelihood method. Three fit indices were computed in order to evaluate the model fit: $\chi^2(df)$, (p value should be higher than .05), the goodness-of-fit index (CFI) should be higher than 0.9, and the root mean square error of approximation (RMSEA). RMSEA less than .05 corresponds to a "good" fit and an RMSEA less than .08 corresponds to an "acceptable" fit (Bentler, 2006). Amos 22 software was used for SEM analysis. The goodness of fit of the data to the model yielded to sufficient fit results ($\chi^2 = 340.75$, $df = 130$, $p = .000$; $CFI = .938$; $RMSEA = .07$). The Instructional Strategies factor included nine items ($\alpha = .91$); four indicators loaded on the Classroom Management factor ($\alpha = .88$); and five indicators constituted the Student Engagement factor ($\alpha = .85$). The validity of the instrument was confirmed.

Teachers' DL Practices This questionnaire was specifically designed for the purposes of the current study based on the above-mentioned adapted Teachers' DL Efficacy scale (Robinia & Anderson, 2010). Each item of the Teachers' DL Efficacy scale was revised to reflect a *practice* instead of the perceived *ability* to act. For example, the item "I am able to control unworthy behavior in an online environment" was revised to "I set clear rules for student behavior in online environment"; or "I can transfer specific learning subject to distance learning lesson" was interpreted as "I change learning materials to fit distance learning". This process was carried out by two experts in the research area of constructivist online learning environments. They were asked to suggest items reflecting online practices relating to the Teachers' DL Efficacy scale items. Their work led to the formulation and adaptation of items. To identify the best-fitted items, inter-rater Cohen's Kappa (k) reliability (Cohen, 1960) was used. The k values were interpreted as follows, $k < 0.20$ poor agreement; $0.21 < k < 0.40$ fair agreement; $0.41 < k < 0.60$ moderate agreement; $0.61 < k < 0.80$ good agreement; $0.81 < k < 1.00$ very good agreement. Results of $0.61 < k < 1$ were considered acceptable for the purposes of the current study. All item descriptions without consensus were discarded from the analysis. Descriptions that were identified as unclear or too similar to another description were omitted. As illustrated in Table 1, the scale consists of 18 items. A 6-point Likert-style format was used ranging from 1 = *never* to 6 = *always*.

Table 1 The Teachers' DL Practices: Sub-factors, item descriptions and internal consistencies (Cronbach's alpha)

Item No.	The following statements address the current time when you are required to teach from a distance. To what extent do you find yourself performing the following activities in actual teaching?	Factor			
		Student Engagement	Instructional Strategies	Classroom Management	
				Classroom Management 1	Classroom Management 2
8	Some of the assignments involve sharing knowledge among students (for example building a shared document in Google Docs)	.820			
7	I initiate learning in groups in distance learning (for example via breakout rooms in Zoom)	.643			
17	I give students group assignments which develop creativity	.632			
11	I create online activities which require collaboration among students	.614			
6	I use programs like Zoom/Google meet to teach subject material (Should load on Instructional Strategies)	.406			
18	I invite an individual student or small groups for one-on-one instruction in Zoom/Google meet to clarify material	.404			
14	I incorporate high order thinking assignments (analysis, synthesis and drawing conclusions)		.763		
16	I design high order thinking assignments for excellent students		.669		
15	I use varied ways to assess students work in distance learning		.571		
12	I adapt learning materials to the special need of my students		.554		
13	I use varied teaching strategies in distance learning (like project-based learning and flipped classroom)	.458	.510		
5	I change learning materials to fit distance learning (for example I use videos, games, and links)				
3	I demand that students take responsibility for their learning (handing-in assignments, attendance list)			.596	
2	I set clear rules for student behavior in online environment			.544	
10	I praise students for their good work to motivate them to learn (Should load on Student Engagement)			.529	
9	I use forum/Facebook group/WhatsApp to create shared communication in learning subjects				
4	When needed, I comment on students breaking discipline rules in distance learning				.714
1	I comment and silence students who talk for no need during Zoom/Google Meet meetings				.706
	Cronbach's alpha	.80	.82	.63	.68

Note: Figures in bold face denote factor loading estimates greater than or equal to 0.4, relating to their respective factor

Exploratory factor analysis was used to determine the validity of the scale (eigenvalue >1.00; item loadings > .40). All scale items were subjected to a principal axis factoring followed by a varimax rotation. Four items were omitted due to low loading results (< 0.40) or when loaded on an irrelevant factor (Duffy et al., 2017; Guadagnoli & Velicer, 1988; Samuels, 2017). The factors accounted together for 44.69% of the variance. The result yielded a three-factor solution, with two sub-categories suggested for the third factor: (a) student engagement (b) instructional strategies; and (c) classroom management (including two sub-factors: classroom management 1, and classroom management 2). Factors a and b demonstrate student-centered approaches, whereas factor c reflects teacher-centered approaches. As can be learned from Table 1, the Classroom Management

factor included two sub-factors: the first refers to setting clear rules in advance, while the second deals with managing online classroom discipline and behavior. In addition to the exploratory factor analysis, confirmatory factor analysis was used to assess the construct validity of the scale. Data used for the SEM were analyzed with the maximum likelihood method. The goodness of fit of the data to the model yielded to sufficient fit results ($\chi^2 = 185.55$, $df = 68$, $p = .000$; $CFI = .924$; $RMSEA = .07$), conforming the three-factor solution, with two sub-factors related to the classroom management factor.

Teachers' Attitudes toward DL This scale was designed by Baş et al. (2016) to capture teachers' perceptions toward ICTs in the teaching-learning process in relation to three

factors: attitudes, usage, and beliefs. In this study, the 10-item subscale measuring attitudes was adapted to estimate teachers' attitudes toward DL, for example, "The use of DL in teaching-learning processes is important" or, "I consider the use of DL a suitable tool for teaching-learning process". A 6-point Likert-style format was used ranging from 1 = *completely disagree* to 6 = *completely agree*. ($\alpha = .93$).

Data Analysis

Data were analyzed by using Partial Least Squares - Structural Equation Modeling (PLS-SEM; Hair et al., 2017) with SmartPLS 3 software, and by analyses of variance and a paired sample *t*-test.

Results

Descriptive Statistics

Table 2 displays the descriptive statistics of the research constructs and indicators. Following the general guidelines for skewness and kurtosis (suggesting that if the number is greater than +1 or lower than -1, then the distribution is skewed, flat, or peaked). The construct distributions can be generally considered normal. As can be learned from Table 2, differences can be observed between the sub-factors of teachers' DL efficacy and Teachers' DL practices (Instructional Strategies, Student Engagement, and Classroom Management). In relation to Teachers' DL efficacy, a repeated measures analysis revealed statistically significant differences among the sub-factors ($F_{[2, 325]} = 29.77$ $p < .001$, $\eta_p^2 = .16$). As shown in Table 2, the highest mean result was indicated for Student Engagement and the lowest for Classroom Management. Statistically significant differences were also found among the teachers' DL practices sub-factors by using a repeated measures analysis ($F_{[2, 325]} = 162.04$ $p < .001$, $\eta_p^2 = .50$). However, in this analysis, the highest

mean result was shown for Classroom Management and the lowest for Student Engagement.

To compare each *efficacy* sub-factor to its respective *practices* sub-factor, a paired sample *t*-test was deployed. A statistically significant difference was shown between efficacy in instructional strategies and actual instructional strategies, focusing on student-centered approaches ($t_{[326]} = 7.452$ $p < .001$). As can be learned from Table 2, the mean score of the *actual practice* was lower than the *efficacy* mean result. In a similar vein, a statistically significant difference was shown between the student engagement sub-factors, wherein teachers' perceived efficacy was higher than their actual practice. Non-significant results were obtained for the classroom management sub-factors.

Research Hypotheses Examination

To assess the research hypotheses Model 2 (Fig. 2) was constructed. This path model includes five constructs, represented in the model as cycles: *Teachers' DL PD*, *DL school support and coordination*, *teachers' DL efficacy*, *teachers' attitudes toward DL*, and *teachers' DL practices*. In addition, the following background variables' effects on the above constructs were checked in this model: age, gender, seniority level, teachers' educational attainment (EA), and teachers' school affiliation: 1 = *primary* 2 = *secondary and high school* (High school). However, merely EA and High school were found connected to DL School Support and Coordination, and Teachers' Attitudes toward DL, respectively, therefore, were entered into the model.

Table 3 displays the bootstrap routine analysis results of the direct effects of Model 2 (Fig. 2). The highest significant moderate results were shown between the following constructs: Teachers' DL Efficacy -> Teachers' Attitudes toward DL; Teachers' DL Efficacy -> Teachers' DL Practices; Teachers' DL PD -> Teachers' DL Efficacy; and DL School Support and Coordination -> Teachers' DL Efficacy.

Table 2 Descriptive statistics of the research constructs and indicators

Construct	Indicators	Mean	SD	Skewness	Kurtosis
Teachers' DL PD		3.33	1.00	0.32	-0.27
DL School Support and Coordination		4.53	1.00	-0.46	-0.41
Teachers' DL Efficacy		4.25	0.70	0.08	0.30
	Instructional Strategies	4.26	0.76	-0.05	0.77
	Student Engagement	4.41	0.86	-0.10	0.22
	Classroom Management	4.08	0.79	0.03	0.99
Teachers' DL Practices		3.71	0.77	0.19	0.06
	Student Engagement	3.07	1.11	0.34	-0.14
	Instructional Strategies	3.89	0.99	-0.01	-0.14
	Classroom Management	4.17	0.88	0.00	0.11
Teachers' Attitudes towards DL		4.00	0.85	0.04	0.57

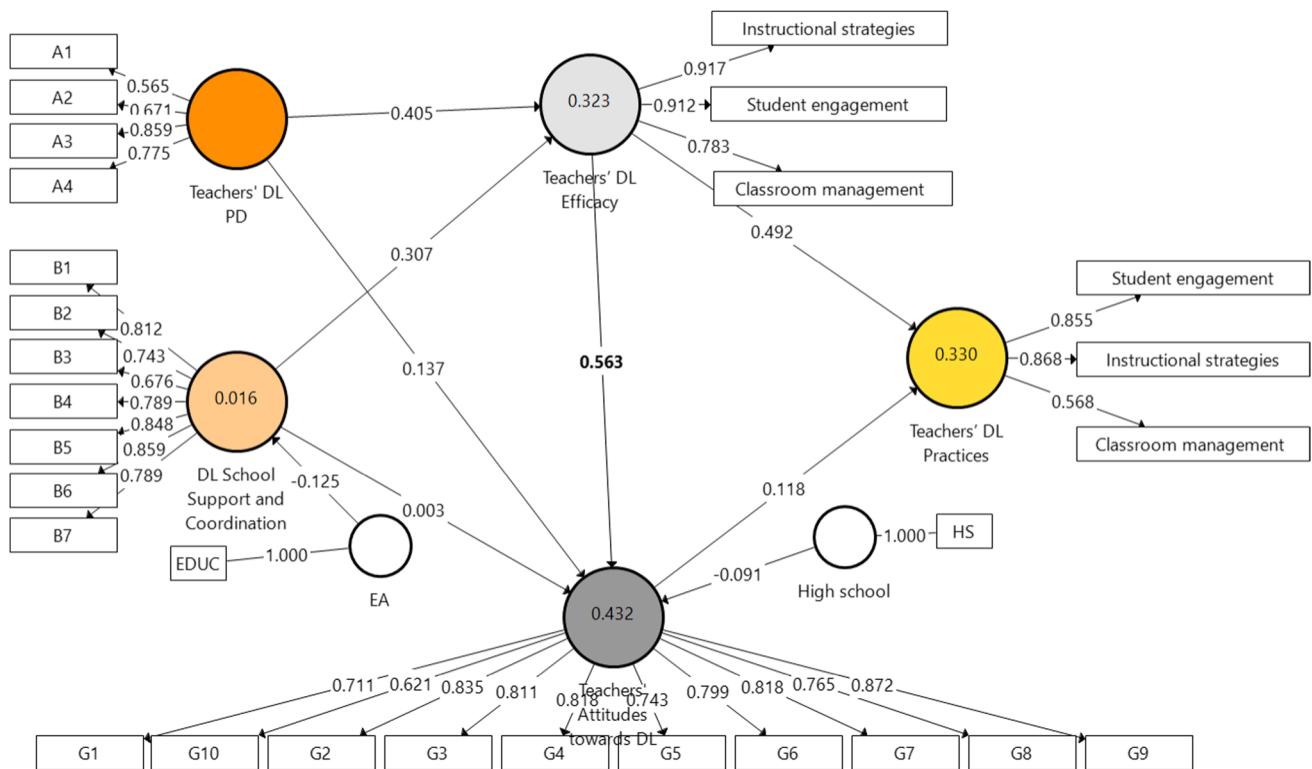


Fig. 2 Model 2. Analysis results of research model by SmartPLS

Table 3 Significance analysis of the direct effects

Specified paths	Direct Effect	t value	p value
DL School Support and Coordination -> Teachers' Attitudes towards DL	.003	0.07	.942
DL School Support and Coordination -> Teachers' DL Efficacy	.307	6.42	.000
EA -> DL School Support and Coordination	-.125	2.27	.023
High school -> Teachers' Attitudes towards DL	-.091	2.12	.034
Teachers' Attitudes towards DL -> Teachers' DL Practices	.118	2.03	.043
Teachers' DL PD -> Teachers' Attitudes towards DL	.137	2.89	.004
Teachers' DL PD -> Teachers' DL Efficacy	.405	8.24	.000
Teachers' DL Efficacy -> Teachers' Attitudes towards DL	.563	12.01	.000
Teachers' DL Efficacy -> Teachers' DL Practices	.492	7.44	.000

The lowest positive results were found between the following variables: Teachers' DL PD -> Teachers' Attitudes toward DL; Teachers' Attitudes toward DL -> Teachers' DL Practices; and DL School Support and Coordination -> Teachers' Attitudes toward DL. The background variables exerted very low negative effects on the dependent variables. All research hypotheses were corroborated.

Model Evaluation

Variance Inflation Factor (VIF) values of all sets of predictor constructs in the structural model were checked for

collinearity. The results showed that the VIF values of all combinations of endogenous and exogenous constructs are below the threshold of 5 (Hair et al., 2017). The coefficient of determination (R^2) values for the endogenous factors ranged from 0.016 to 0.432 these values can be considered moderate (Hair et al., 2017). The change in the R^2 value (f^2 effect size) showed that the background variables had very low effect sizes of 0.014–0.016 on the endogenous latent variables.

Teachers' DL PD had a small effect size on teachers' attitudes toward DL (0.025). Teachers' DL efficacy highly affected teachers' attitudes (0.378) and DL practices (0.214).

The blindfolding procedure was used to assess the predictive relevance (Q^2) of the path model. Values larger than 0 suggest that the model has predictive relevance for a certain endogenous construct (Hair et al., 2017). The Q^2 values ranged from .009 to .255.

The Qualitative Study

Method

Participants

The participants in this study included 22 teachers (15 women and 7 men) from eight public elementary schools in northern and central Israel. The teachers' distribution by seniority was as follows: 10 teachers had 15–22 years of teaching experience; 10 had 7–14 years of experience; 2 novice women teachers had 2–4 years of teaching experience. The participants volunteered to participate in the study by contacting the researcher via email published in the online questionnaire. The participants were asked to describe how they functioned, felt, and coped at work during the crisis. Using the phenomenological paradigm enabled an in-depth assessment of the challenges and tools that teachers dealt with from their point of view. It is typical in qualitative research to study a few individuals to enable the researcher to provide an in-depth picture of the phenomenon under study and to present the complexity of the information provided by individuals (Creswell, 2015).

Measurements

The research tool consisted of a semi-structured interview. The participants were asked several questions that were pre-planned, but questions could be added according to how the dialogue proceeded. The interview included topics that arose in the literature review of the current study and from the research questions. After becoming initially acquainted with the research participants, they were asked questions that focused upon the main focal points of the study:

1. The professional aspect: Technological training for distance learning and support.
2. The personal aspect: Efficacy and attitudes of teachers toward distance learning.
3. The practical aspect: Teaching methods in distance learning during the pandemic.

Research Procedure

The participants were contacted by phone before the interviews took place. They received a detailed explanation of the research topic and times and locations were set up for the interviews. 15 interviews were conducted using Zoom. Each interview lasted from 45 to 90 minutes. The participants offered comprehensive and detailed responses to the questions and raised additional topics. Codes were followed to preserve the ethical principles of the study: The participants were informed about the research topic with the promise that total anonymity would be preserved. They were told that each person's name would be changed to a pseudonym and any identifying details would be eliminated when the research report was written. The study was approved by the college's Ethics Committee.

Data Analysis

Data analysis in the study was done according to the deductive approach based on existing themes in the proposed theory, combined with the inductive approach that enables the identification of additional significant categories (or sub-categories) at the analysis stage. The combination of these two approaches is considered essential throughout the analysis stage (Creswell, 2015).

Findings

This section illustrates the interviewees' insights into their personal experiences during the pandemic while referring to the following main focal points in this study and enriching them with vivid examples. A summary of main findings is provided at the end of this section. The main categories were:

1. The professional aspect: technological training and support for distance learning, included two sub-categories: (a) teacher engagement in professional development; (b) school support and coordination.
2. The personal aspect: efficacy, and attitudes about distance learning, comprised three sub-categories: (a) teachers' DL efficacy; and (b) teachers' attitudes toward ICT in DL.
3. Practical aspect referring to teachers' DL Practices Teacher-centered vs. student-centered practices.

The Professional Aspect: Technological Training and Support for Distance Learning

Teacher Engagement in Professional Development

Two groups of teachers were detected in the analysis: The first group consisted of 10 teachers who received training for incorporating technology in teaching before the outbreak of the COVID-19 pandemic. Their comments reflect that the training they received before they entered the educational system enriched their capabilities in real-time. Anat described this as follows:

I attended a training course in mathematics, which is my area of expertise. It helped me with ideas for teaching mathematics in the various classes. At the beginning of the year, there were a few meetings about distance learning, I was already familiar with computers, and I like the world of computers, so I don't think the course contributed to me very much.

The second group consisted of eight teachers who participated in a short training course provided by the school during the lockdown. Most of the courses took place online because of COVID-19. Sarit explained that she was exposed to numerous tools. Like most of the participants in this group, she explained that the tool they used most frequently was the Zoom application.

I attended a course given by the school when the pandemic began, about three weeks after the first lockdown. I mostly learned how to use Zoom and everything it offers. I learned to build a "Kahoot!" quiz and to use "Padlet". I admit I don't use this interface because it's not relevant to my students' level of function. I also learned to use another interface that creates a sun of concepts, but I don't remember what it is called. I don't use that either, but I think the main contribution was everything having to do with Zoom and increasing my confidence in giving a lesson this way.

School Support and Coordination

All the teachers mentioned that their school had a "technical coordinator" or "ICT coordinator" who was available and responded to any question or problem, "At the school where I work there is a computerization coordinator whom we can approach about any question. I think it's important that there is someone who knows and understands the world of computers and can help with questions at any time, even from a distance (David). Miriam also explained: "We have a computer coordinator at our school, and she prepared folios with guidelines that we can use. We can

also sign up for short individual consultations that she offered." Another type of technical assistance that most teachers spoke about was getting help with equipment for remote teaching that was lacking. Some of the teachers explained: "Our school loaned laptop computers to teachers who did not have them or to teachers whose children needed their computer to study by distance learning. Batya described the help she received: "We were asked if we had a network camera and microphone. My computer has a built-in camera, but my microphone did not work well, so I was given another one without any questions asked. Everyone also received a whiteboard with a stand and markers."

Ten teachers reported that in addition to technical support, the ICT coordinators and the administrative staff also provided emotional support. They were available throughout most of the day to solve problems, even if the solution lay outside routine school policy. As Rachel described, "This support contributed to teachers' ability to use technology successfully for distance learning during the COVID pandemic."

Dalia described a feeling of "sharing the same fate" and mutual caring:

The coordinator checked how I was doing every day or two, and the principal made sure to call at least once a week. Both of them, as well as the other teachers in my grade and the professional staff, were available at all times. There was a sense that we were all in this together and that everyone cared about everyone else – from making sure everyone was OK to sending complete lesson plans to each other.

The Personal Aspect: Efficacy, Attitudes, and Feelings about Distance Learning

Teachers' DL Efficacy

Nine of the participants reported that they lacked the efficacy to conduct lessons remotely and felt that this type of teaching was a waste of time. Sivan, for example, expressed such feelings, and felt she would have to return to face-to-face teaching,

I was unable to understand what the students did and didn't understand, what I needed to go over again, who was alone, and which student's parents were not available. I felt that I was teaching lessons with no purpose and that after we went back to school, I would have to teach everything again. I was unable to teach the material at the rate I needed to keep up with what I should have been teaching at that time of year. In short, it was total chaos.

Twelve participants testified that during the pandemic and the transition to distance learning they developed efficacy that they had difficulty developing previously. Sigal explained that in the past she had been deterred from incorporating technological tools in her teaching and thought she was incapable of doing so. However, over time she understood that the transition to distance learning was simpler than she thought.

To tell you the truth, I learned everything that I now know about distance teaching during the pandemic, while I was doing it. I developed technological abilities that I never thought I would succeed in mastering. I was deterred at first, but it's easier than you think. I also think that my creativity and ability to improvise soared because there simply wasn't any choice.

Teachers' Attitudes toward ICT in DL

Twelve participants attributed their lack of ability to successfully teach remotely to personal barriers that stemmed from negative attitudes toward distance learning or toward incorporating technology within teaching. On the other hand, seven teachers felt that these barriers were eliminated following the crisis and the transition to distance learning. This transition brought about a change in attitudes toward incorporating technology because it forced them to "leave their comfort zone" (Rinat). Gila's remarks can be attributed to the group of teachers who described a "personal barriers" in relation to distance teaching,

I think that the most difficult thing I had to cope with was myself. I had a huge block regarding anything having to do with lessons of this type. At first, I approached lessons with a lot of frustration. It took me much longer to prepare lessons, and I didn't feel that I presented any of them the way I wanted.

Karen described herself as a "technophobe" who was forced to integrate technology into her teaching despite the fact that she does not feel that this was the best method to give a lesson smoothly,

As a technophobe, it was difficult for me to get used to the fact that I had to implement a technological lesson. During the first lesson when I didn't know how to use Zoom most of the lesson was spent asking "Can you hear me? Tell me if you can hear me." Even after several lessons and after I was relatively used to it, my lessons still did not go smoothly.

Other teachers described how their attitudes toward incorporating technology in teaching changed. This integration proved to be effective for them, and technology

was transformed from an "enemy" to a "friend". This was explained by Sol:

I now understand how much I can utilize the platform of smartphones, which all the children have. Instead of their being the teachers' enemy at school, they can be transformed into a helpful tool using a variety of applications that I learned about. The same holds true for the computer room at school that is not used most of the time.

Practical Aspect Referring to Teachers' DL Practices: Teacher-Centered Vs. Student-Centered Practices

Most of the teachers (14) testified that distance learning was challenging for them and that from their point of view the experience was not positive. The main reason for this was their inability to "control" what was going on during the lesson, as Esther explained: "This was a particularly horrible period! The students made things difficult for me. They shut off their cameras, and there was no connection with the students in the class. I didn't really know what they were doing behind the closed lens of their cameras."

Other teachers felt that distance learning posed difficulties for them professionally and harmed their self-confidence. Gila noted that remote learning created a sense of "lack of experience, lack of confidence, and frustration due to the burden that was created". Similarly, Sigal also expressed a sense of frustration: "I still don't know what I think about this method. At the moment I'm still trying to deal with it every day even a little bit in order to survive."

All the teachers who were interviewed claimed unequivocally that they prefer traditional frontal teaching. "I won't say that I suffered, and this was a good solution when needed, but I definitely prefer frontal teaching." (Meital).

Six participants spoke about pedagogy that is suitable to distance learning while emphasizing student-centered learning environments that replace traditional teacher-centered practices. Ruth described how these methods develop independent learning:

I think that a successful aspect of distance learning is the fact that the students learn and experience new things, which always pleases me. They then learn to use the computer. This is a different, interesting way of learning. They acquire skills for independent learning experience.

Twelve teachers simply "transferred" frontal teaching methods to a virtual dimension without attempting to channel distance learning into changing teaching methods. This was described by Roni:

I continued teaching in small groups using Zoom. I organized an orderly schedule for each learning group.

They were the same groups in which we studied face-to-face at school and were divided according to the students' levels. The contents and objectives remained the same and were according to the study program.

Similarly, Reut used the terms borrowed from frontal teaching methods to describe distance learning. She described how she attempted to organize a learning environment that was “free of distractions” that would enable her to “teach the material.”

First of all, and most importantly, I make sure there is an environment that is free of disturbances and distractions. I make sure that there won't even be a family photo or cup of coffee in the “frame” so that there will be no distractions for the students. The most significant differences were in the way I taught the material. Most of the planning was devoted to transmitting the material clearly.

Summary of Main Findings

Model 3. (Fig. 3) summarizes the qualitative findings' additions (in bold) to the theoretical model:

- In relation to the *professional aspect*, the participants underscored the importance of routine training to use effective practices of DL and indicated the ineffectiveness of emergency response training. Moreover, they emphasized the importance of emotional support provided during the pandemic alongside technical assistance.
- The *personal aspect* includes two types of teachers: conservative and adaptive to changing circumstances. It also seems that the abrupt transition to DL might play as a catalyst for some teachers – gradually changing teachers' negative attitudes toward DL to positive ones.
- Lastly, in relation to the *practical aspect*, the analysis identified two basic types of teachers – those who

sought to control the learning environment, and those who encouraged independent learning.

Discussion

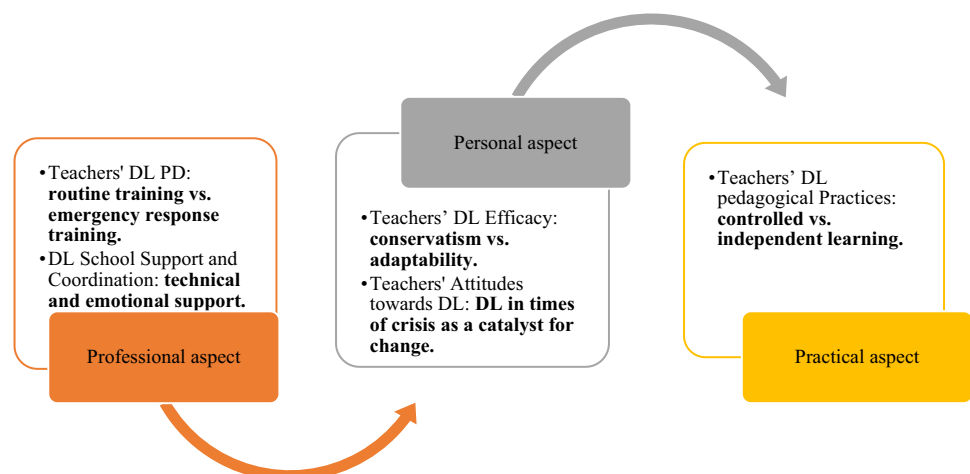
The main incentives for this mixed-methods study were to explore the relationships between three identified aspects presented in the literature review: (1) Professional aspect, including teachers' distance learning (DL) professional development, and DL school technical support and coordination offered to them by the school; (2) personal aspect, including teachers' attitudes toward DL, and their perceived DL self-efficacy; (3) practical aspect - teachers' actual DL practices during the COVID-19 crisis.

The empirical model suggested that teachers' perceived efficacy to deploy a variety of DL strategies and their attitude toward integrating technology into their teaching practices were informed by their engagement in DL professional development programs, and the technical support provided by their schools. These variables, in turn, affected their actual DL practices during the COVID-19 crisis.

The results of the quantitative data analysis revealed that teachers' perceived efficacy to deploy a variety of DL strategies exceeded their actual use of such activities during the crisis. Moreover, the teachers believed they were able to encourage student engagement in DL and were less able to manage the online classroom, however, in practice, they have put an emphasis on maintaining classroom discipline rather than enhancing collaborative practices.

Indeed, previous studies (Miller et al., 2017) pointed to a connection between teachers' efficacy and their actual teaching, maintaining that teachers who possess a strong sense of efficacy are more open to providing a positive learning environment for their students. However, the current research elaborates on these previous findings by analyzing the factors that constitute teachers' DL efficacy and actual behavior

Fig. 3 Model 3. The theoretical model including qualitative analysis findings



and points to possible discrepancies among these variables in times of crisis. What seems to be an ‘easy’ instructional practice to use in DL (i.e., student engagement), turned out to be the least used online activity. Differently stated, the teachers failed to translate or transfer their perceived abilities into actual DL activities. It can be inferred that the previously recognized symmetric relationships between teachers’ conceptions of teaching-learning and their actual practices in the classroom (Donnelly et al., 2014; Zhang & Liu, 2013), seem to be destabilized in times of crisis when an instant change to online/distance learning is required.

As indicated by the suggested empirical model, to assure an effective application of student-centered (competency-based) activities in online environments, such as collaborative assignments, appropriate educational and technical preparations are required in advance. These should be aimed at increasing teachers’ efficacy to use appropriate technology to support their online teaching practices and affect their attitudes toward DL. Merely providing technical support during a crisis would not suffice. This inference can be corroborated by previous studies (Alt, 2018) which found a strong link between teachers’ ICT competencies and their ICT PD, showing that teachers who participated in ICT-related PD courses felt more competent in incorporating ICT into education. During these programs, teachers need to practice and acquire knowledge and skills on how to harness the vast potential technology offers to implement online constructivist activities. Makki et al. (2018) suggested that PD interventions should focus on improving teachers’ comfort levels with a variety of computing features. Furthermore, they stressed the importance of guiding teachers through the curriculum design process and allowing them to create their own lesson plans. This may stimulate the computer comfort aspect necessary for successful classroom computing integration.

Therefore, this study’s results may suggest taking into consideration institution support and providing ongoing effective PD programs for teachers centered on essential skills and knowledge required for successful integration of technology into pedagogy. These ongoing programs were reported useful by teachers interviewed for this study, and much more effective than emergency response training. In such teacher training programs, the interplay among pedagogical, technological, and content knowledge, should be acknowledged rather than treating them as separate components. Such efforts might affect teachers’ attitudes toward DL, and according to the research model, indirectly increase their use of varied DL practices. Positive attitudes toward innovation are valuable and crucial for successful transformation in educational practice (Baş et al., 2016).

However, it should be noted that the specific activities teachers mainly deployed during this unique experience were highly skewed toward teacher-centered approaches to

learning, by which the teacher sought to establish stability and order. These findings are supported by reports from the Israeli Ministry of Education (2021) and by previous studies (Arora & Srinivasan, 2020; Burgess & Sievertsen, 2020; Onyema et al., 2020), demonstrating that the potential for significantly changing teaching methods that lay hidden within the reality enforced by the COVID-19 pandemic was not realized. The studies mainly pointed to the failure of distance learning during the pandemic to develop lifelong learning skills. Therefore, the necessity to develop programs to circumvent these challenges is of special importance. As suggested by our empirical model and qualitative study, such programs should include routine training, and during the abrupt turn to DL - technical and emotional support. Such programs should focus attention on helping teachers acquire the skills necessary to successfully implement learner-centered practices in DL, thereby raising their self-efficacy regarding these processes (Koh et al., 2016; Moreira et al., 2019; Scully et al., 2021; Tondeur et al., 2021; Valverde-Berrocoso et al., 2021; Vongkulluksn et al., 2018). This may serve as a catalyst for teacher’ DL attitudinal change (González-Sanmamed et al., 2017; Guillén-Gámez & Mayorga-Fernández, 2020; Semerci & Aydin, 2018; Wasserman & Migdal, 2019), and consequently their actual DL pedagogical practices.

Limitations and Directions for Future Research

The present work features several limitations and directions for future research that warrant mentioning. Several variables that were not tested in this research might have impacted teachers’ behavior during the crises and consequently affected the quality of their instruction. For example, underprivileged students are likely to have sporadic Internet access or none at all because they cannot afford the cost of a laptop computer and Internet connection, or because they live in regions with low connectivity (North, 2020; UNICEF, 2020). In this context, many parents with socioeconomic disadvantages found it difficult to play a meaningful role during the crisis due to a lack of educational resources (Dahan et al., 2020). Hence, teachers might have struggled to find alternative ways to distribute materials and to stay in touch with these children to assure their well-being and support their learning.

Teachers’ high levels of stress and anxiety during the transition to DL (Rabaglietti et al., 2021; Santamaría et al., 2021) were not entered into the empirical model, hence their connections to the examined factors were not tested. Teachers’ emotional condition can influence their self-efficacy (Bandura, 1997). High levels of stress and anxiety experienced among teachers during COVID-19 may be an influential factor on teacher self-efficacy (Pressley, 2021), and therefore should be addressed in future studies.

Conclusions and Implications

These findings support claims raised in previous studies regarding the need for formulating principles for teachers' professional training within a digital environment. In addition to nurturing teachers' technological abilities in teaching, it is essential to relate to teachers' beliefs regarding the integration of technology in teaching and to evaluate them according to the fundamental principles of online learning from the beginning of their training (Dovbenko et al., 2020) while relating to the social and emotional aspects that accompany online learning (Israeli Ministry of Education, 2020).

Further work is needed to specify how this should be accomplished. Such efforts should be based on the competency-based approaches to learning that support collaboration among students. Through these training programs, alternative teaching methods should be offered to teachers to engage students when they are confronted with deterrents or insufficient technological resources during times of crisis. Moreover, with the growing attention paid to blended learning, teachers may use the knowledge and skills gained through these programs in their day-to-day instructional efforts that combine online interactive educational activities with face-to-face place-based classroom methods.

To increase the impact of PD programs, providing teachers with opportunities to build communities of practice may sustain the outcomes of such efforts and have a positive impact on teachers' technology integration and engagement in online professional learning (Abdelmalak, 2015; Zhang & Liu, 2019).

These communities should include school leadership figures such as headteachers, educational advisors, social directors, computerization coordinators, and teachers. These people will play a central role in helping to cope with distance learning in times of crisis. These communities should not merely deal with technological and pedagogical aspects. They must also deal with transverse issues that occupy teachers during the transition to distance learning, including providing emotional support. There is currently a need to establish communities of teachers in order to reorganize teaching and learning processes and to help provide a response to needs such as building a stable, supportive framework. These communities will also offer teachers an open space for sharing, thinking about the challenges, and exchanging examples of success.

Continuous peer support, even with limited formal guidance, can be vital in helping teachers overcome their constraints toward incorporating technology and reforming their practices. By exchanging and sharing ideas in a collegial manner accompanied by virtual and digital

applications, such continuous communities of practice platforms might support professional peer learning and make a distinction in educational preparation, particularly during times of crisis.

Data Availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of Interest The author states that she has no conflict of interest to declare.

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