



## Article

# Parental Involvement in Distance K-12 Learning and the Effect of Technostress: Sustaining Post-Pandemic Distance Education in Saudi Arabia

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**Abstract:** This study explored the effect of parental involvement in K-12 distance learning activities on their perceived technostress and behaviours of support toward their children's learning in Saudi Arabia. Partial least squares structural equation modeling (PLS-SEM) was used to analyse the data. Applying the person-technology (P-T) fit model, this study proposed a model comprising five factors to answer the research questions. The five factors were parental involvement, parents' technostress, parents' self-efficacy, school support and behaviours of support. Analysis of 651 parent responses showed an insignificant relationship between parental involvement in distance learning activities and parents' technostress. However, there was a significant and positive relationship between parental involvement and parents' behaviours of support toward their children's learning. The results also indicated that when parents' technostress increases, their supportive behaviours rise accordingly. The level of technostress among parents in this study was found to reduce with an increase in both parents' self-efficacy levels and the level of school support provided by administration and teachers to parents in distance learning environments. The findings of our study suggested several important implications that contribute to providing more effective and successful distance education and supporting the future of post-pandemic digital education in Saudi Arabia.

**Keywords:** parents; distance education; technostress; K-12 education; Saudi Arabia; post-pandemic



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## 1. Introduction

After the emergence of COVID-19, distance education has become the only solution to replace traditional education around the globe [1,2]. UNESCO [3] reports that over 181 countries have enacted national closures, affecting over 91 percent of the student population around the globe. Therefore, schools have been compelled to quickly readjust their teaching and learning plans and undertake a full digital transformation [4,5]. In the literature, the term distance learning has been used interchangeably with home-based learning [6,7] and remote learning [8]. During the pandemic, many countries around the world have introduced various solutions to maintain the education process, including digital platforms, online channels, TV broadcast and video lectures [9]. The Ministry of Education in Saudi Arabia, for example, launched an educational platform named Madrasati as the official educational platform for distance education. As a result, the Ministry of Education has worked to rethink and adjust their strategic plans to acknowledge distance education as an official method of education in addition to the traditional method, as in the past, distance education was not considered an option in K-12 teaching and learning. Distance learning is defined as digital platforms that educational institutions employ to meet students' learning needs and achieve learning goals [10]. Distance learning activities refer to all learning activities that take place through distance learning platforms, including holding and attending virtual classes, synchronous and asynchronous interaction, and performing online tests and assessments.

In recent years, education research, policy and practice have emphasised the significant role of parents in facilitating the distance learning of their children [11]. Parental involvement is generally perceived as an important and beneficial factor for children's success in learning [12]. Throughout the pandemic, families have been dealing with many stressors due to health and job complications and, therefore, have been incapable of supporting the learning of their children properly [13,14]. Moreover, the shift towards distance learning in schools imposed by the pandemic has put a significant burden on parents and caregivers, creating new roles for parents in the learning of their children [15–17]. Distance learning activities frequently rely on parents to provide assistance and support that teachers cannot provide to children at a distance [10,18,19]. To ensure the success of children's learning in a distance learning mode, as indicated by Waters et al. [20], parents may support their children by facilitating and monitoring their learning tasks and activities, mentoring and guiding their learning progress, and encouraging and motivating them to learn and succeed.

Parental involvement and support are essential to ensure the success of this type of education, especially with K-12 students. Given the large number of studies confirming the significant role of parents' behaviours of support in the remote learning of their children [7,11,21–26], it has become necessary to consider the factors influencing such support. Parents' self-efficacy and school support are two important factors that are emphasised in the literature of parental involvement and parents' support. Parents' self-efficacy refers to parents' perceptions of their confidence and ability to support their children to perform successfully in learning [27]. It has been indicated to be positively associated with parental involvement and the quantity and quality of parents' support to the learning of their children [28]. Similarly, school support, provided by teachers, administrative staff and school leadership, is one of the most important factors contributing to facilitation and support for the role of parents in distance education [14,29].

The transition to distance education has brought a complete reliance on digital technologies in all teaching and learning aspects [30]. Parents participating in distance education are forced to use digital technologies with their children in several learning activities, including the use of educational platforms to attend virtual classes or attain learning materials, the use of different software and applications to perform quizzes and learning tasks, and the use of social networks to communicate and interact synchronously and asynchronously with teachers and peers. This has created a serious and unprecedented interaction between parents and their children on the one hand, and digital technologies, tools and applications on the other. As a result, there is significant pressure on parents to use and interact with these digital technologies while educating their children, which possibly influences their behaviour toward the support provided to improve their children's performance. Given the widespread usage and quick evolution of technology in today's society, Şahin and Çoklar [31] asserted that it is critical to assess people's technostress levels and take appropriate safeguards. The transition to distance learning caused great technostress (stress from using technology) for many parents and caregivers in terms of adaptation to a new digital learning environment (particularly for parents with low-level or no experience), intensive use of different technological tools and applications and the complications this brings, as well as the additional workloads that were thrown at them.

Given the technostress caused by parents' involvement in distance learning activities and its influence on their behaviours of support toward their children's learning, the current study is significant. Distance learning is expected to be an integral part of the education system in the future. The Kingdom's Vision 2030 emphasised the development of education focused on digital transformation at all levels of K-12 [25]. Therefore, post the COVID-19 pandemic, distance learning, within the blended learning approach, is expected to be the new normal for the K-12 education system in Saudi Arabia. Therefore, understanding this phenomenon is timely and critical for schools' leadership and educator policy-makers. This study intends to add to the expanding literature of distance learning by examining the effects of parental involvement in distance learning activities on parents' possible

technostress and their behaviours of support toward the learning of their children. It also explores the influence of parents' self-efficacy and school support on these relationships. As a result, this study aims to answer the following:

1. What are the relationships between parental involvement in distance learning activities, parents' technostress and parents' behaviours of support?
2. What are the relationships between parents' self-efficacy, parents' technostress and parents' behaviours of support?
3. What are the relationships between school support, parents' technostress and behaviours of support?

## 2. Theoretical Background

### 2.1. The Person-Technology (P-T) Fit Model

The current study investigated the effect of parental involvement in distance learning activities on their technostress and behaviours of support toward their online students. This study was theoretically underpinned by the person-technology (P-T) fit model [32]. This model establishes a logical link between technological characteristics and technostress. The term technostress is defined by Brod [33] as the stress that results from the inadequate use of technologies by individuals. Therefore, in this study, technostress refers to parents' inability to deal with new distance learning activities. Parents, as individuals, experience stress due to their involvement in distance learning activities (technostress), which may negatively affect their behaviours of support (behavioural response) toward their children's distance learning. The P-E fit model suggests that when an individual's characteristics match their environment, the individual reacts positively to the environment and any misfit, on the other hand, will exhibit negative attitudes and reactions [34].

Three main elements are included in the P-T fit model. First, ICTs characteristics represent the features of a particular ICT application [32] (referred to as distance learning attributes in this study). Second, stressors refer to situations that cause stress [32], which represent technostress in this study; these situations might be related to the role and task of an individual [35]. Third, strain is defined as an individual's behavioural or psychological reaction to the stress creators [32]. Psychological strain is emotional reactions to stressful conditions and includes dissatisfaction, depression and negative self-evaluation. Behavioural strain includes poor task performance and lack of productivity [35,36]. This study primarily discusses behavioural strain (parents' behaviours of support toward their children's learning) that is affected by parental involvement in distance learning, causing technostress.

According to Ayyagari [32], it is critical to understand "technology-induced stress" (technostress) in technologically enhanced environments (p. 832). By analogy, in distance learning environments, it is important to comprehend the negative effect of technostress caused by parental involvement in distance learning activities on parents' behaviours of support toward their children. It is also important to investigate the factors affecting such technostress. Therefore, this study addresses several gaps found in the literature. First, recent literature has claimed that parental involvement and support in distance learning environments has been under-researched, particularly from the perspective of parents [6,19,37]. Therefore, further studies are needed to examine factors affecting parental involvement in distance learning activities so that better behaviours of support for children's learning can be suggested. Second, most technostress research has been conducted in workplace environments and very little research has been undertaken in educational settings [38], particularly with regard to parental involvement. The influence of the technostress factor on the relationship of parental involvement and behaviours of support in distance learning has not previously been examined. Furthermore, the factors of parents' self-efficacy and school support associated with parental involvement and support in distance learning activities have not yet been fully investigated in this relationship. Therefore, this study extends the related literature on parental involvement in distance education

to focus on technostress factors influencing parents' behaviours of support toward the learning of their children.

Third, educational researchers have paid little attention to the P-T fit model and its role in understanding the impact of technostress in educational contexts [39,40]. For example, many studies have emphasised the influence of technostress on teachers' productivity (behavioural response) [40–42] or students' performance [38,43,44]. However, this model has not been used to understand the effect of technostress resulting from parental involvement in distance learning activities, and especially its effects on parents' behaviours of support toward their children. One recent study by Manning [45] investigates the relationship of working-from-home parents' involvement in K-12 students' transition to a distance learning platform and their overall technostress and individual work performance. The outcome of this study showed that parents' involvement in K-12 students' transition to a distance learning platform had a significant relationship with their overall technostress and work performance. In summary, given the practical significance and research relevance, the current study intends to investigate the role of parental involvement in inducing possible technostress that might negatively affect their behaviours of support toward their children's distance learning. This research study is organised as follows. First, the study constructs (variables), including parental involvement, parents' behaviours of support, parents' self-efficacy and school support in distance learning environments, are introduced. Next, the development of hypotheses and research model are discussed. Then, research methodology including setting and sample, instrument, data collection and analysis is presented. After that, the results are demonstrated, followed by the discussion and implications. Finally, conclusion and limitations are discussed.

## 2.2. Parental Involvement

Parental involvement means the partaking of parents in the learning of their children both in school and at home [46]. In distance learning environments, parental involvement is vital to support the learning of their children and ensure their success [47,48]. In this study, parental involvement means that parents actively and continuously participate in a number of distance learning activities with their children. In distance learning, parents may participate in the use of digital learning platforms for accessing and sharing learning resources, helping their children do learning tasks, assignments and exams, or even interacting with the school community and other peer parents (e.g., via social media).

## 2.3. Parents' Behaviours of Support

Parents' behaviours of support are defined in this study as how parents perceived their roles and tasks to support their children in distance learning [20]. Parents can support their children by tutoring them directly and helping them review school materials. They can also influence the learning motivation of their children by stimulating scientific curiosity, enhancing self-confidence and encouraging their disposition toward successful learning [49]. Parents may support the learning of their children by adopting a number of behaviours such as assisting and monitoring homework, encouraging and supervising schoolwork, and communicating with their children about their learning performance and their expectations for academic progress [28].

## 2.4. Parents' Self-Efficacy

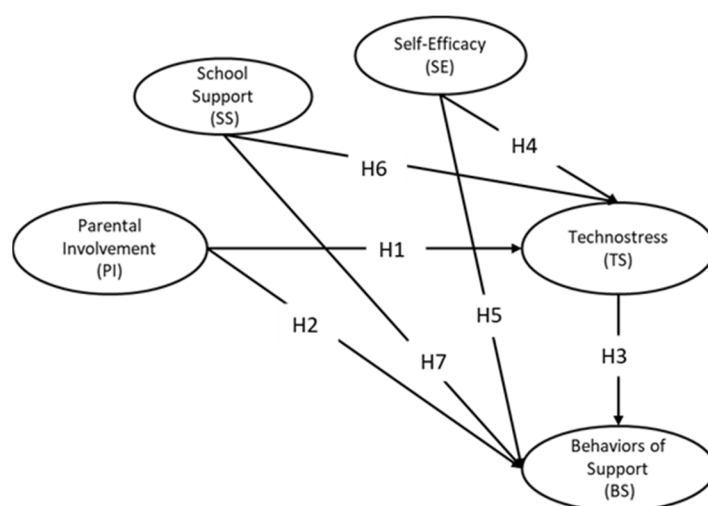
Self-efficacy refers to the confidence and ability of individuals to accomplish tasks [50]. In the field of parenting, self-efficacy is emphasised to be a powerful determinant of parental behaviours of support toward the learning of their children [49]. Parents' self-efficacy in education may be characterised as parents' beliefs that they are useful for the learning of their children and have a positive influence on their success [27,28]. Accordingly, in the current study, parents' self-efficacy in a distance learning environment refers to the extent to which parents believe in their ability to provide the adequate support for their children in distance learning activities in order to ensure their learning success.

### 2.5. School Support

The school–home relationship has been recognised as an important factor in successful parental involvement in their children’s education [51]. In distance learning, a partnership between parents, teachers, administrators and school leadership is typically required for effective parental involvement [6]. The social support provided by the school environment can assist both students and their families in overcoming difficulties and navigating a stressful transition phase [11,51]. School support refers to all actions by schoolteachers, administrators and leadership in the form of providing services and support [11]. Tazouti and Jarlégan [28] indicated that schools should facilitate parents’ engagement through several actions including encouraging parents to interact with teachers about their children’s schoolwork, attend school-organised meetings and participate in parents’ committees and associations. In this study, we refer to school support as the extent to which parents perceive the availability of help or support provided by the school community to assist them in dealing with distance learning activities to support the learning of their children.

### 3. Development of Hypotheses and Research Model

According to the P-T fit model, current study examined several relationships among K-12 parents’ involvement in distance learning activities, their perceived technostress, and its influence on their behaviours of support provided to their children. Two important factors were found to affect these relationships: parents’ self-efficacy and school support within the distance learning environment. Figure 1 represents the proposed conceptual model for all the five relationships in this study. In Figure 1, parental involvement in distance learning activities represents the ICTs characteristics. Parents’ technostress (stressors) influences the relationship between parental involvement and parents’ behaviours of support (strains) in distance learning activities. However, parents’ self-efficacy and school support affect the relationship between parental involvement in distance learning activities and parental technostress. Lack of a sufficient level of parents’ self-efficacy and school support (misfit) results in more technostress from parents’ involvement in distance learning activities and, thus, negatively affects how they behave in supporting the learning of their children. The following section discusses the literature relevant to the relationships of this study’s constructs and, therefore, the formulation of the seven hypotheses.



**Figure 1.** Proposed research model.

#### 3.1. The Relationships between Parental Involvement, Technostress and Parents’ Behaviours of Support in Distance Learning Activities

As a result of the rapid and unprecedented digital transformation to distance education during the pandemic, parents played the most important role in the physical absence of teachers and schools [22]. Many recent studies in the field have found that parents’



involvement in distance learning activities is stressful in terms of the quantity and quality of support required for children to succeed in their distance learning [14,15,21,48]. Parents are under pressure to maintain high focus and interest while managing the continuous demands of online classes and activities that have attempted to follow a structure comparable to face-to-face learning [21]. Spinelli et al. [52] in their study revealed that the more stressed the parents feel, the less they are involved in the distance learning activities of their children. In general, previous research has found that ICTs contribute to stress [38,53]. Therefore, as a result of the digital nature of the distance learning environment and its activities, technostress plays a major role in the pressure experienced by parents in educating their children remotely. Manning [45] investigated the relationship between parents' involvement in K-12 student's distance learning platforms and their technostress and work performance. Results indicated a significant association among parents' involvement, their overall technostress and work performance. Therefore, the first hypothesis was formulated:

**Hypothesis 1 (H1).** *A significant association exists between parental involvement in distance learning activities and parents' technostress.*

When parents are involved in distance learning activities with their children, they need to provide more of the supportive behaviours to ensure their success in learning [54], particularly in the case of younger students [15,18]. The shift in learning has necessitated new responsibilities for parents and caregivers in terms of monitoring, mentoring and motivating children during online learning [14–16,48]. Children in online learning environments, especially K-3 students, require parental help, since they are less motivated, self-disciplined and self-directed, which has been identified as the most difficult challenge for parents [55]. Lau and Lee [56] who investigated parents' perceptions on distance learning experiences, found that most children were not independent and required a lot of support from their parents. Another study by Garbe et al. [26] exploring how parents experienced remote online learning showed that most parents were aware of their critical roles as supporters of their children's learning. Several studies implemented at the time of the pandemic revealed that parents' burdens increased in terms of monitoring, mentoring and controlling the learning of their children [15,55,57]. Therefore, we suggested the second hypothesis:

**Hypothesis 2 (H2).** *A significant association exists between parental involvement in distance learning activities and parents' behaviours of support.*

Parents' responses to stress during emergency circumstances may influence their parenting behaviours and, therefore, their ability to support the educational needs of their children [58,59]. The annual stress report by the American Psychological Association in 2020 showed that more than 7 out of 10 parents indicated that adapting to the new distance learning environment was challenging as well as handling online learning activities was stressful [60]. Lee et al. [7], in their study investigating parenting activities in distance learning, found that parents who were stressed negatively affected the schooling of their children at home. Managing and organising digital learning activities is one of greatest difficulties encountered by parents, especially with young people [61]. In distance learning environments, parents are expected to create e-learning opportunities, provide technological support and regulate when and how their children use digital technologies [6,17]. The "technology-oriented nature" of distance learning during COVID-19 denotes that families spend significant time using technological devices [30] (p. 4). The fact that distance learning depends entirely on the digital environment in all its aspects and activities has created great technological pressure for parents [21]. For example, parents have had to develop their digital skills so that they can provide technical support to their children, as well as dedicate a large portion of their time to dealing with the overwhelming messages (via social networks) and emails that they receive from teachers and school administration about the learning of their children. Studies have shown that teachers in general suffer from stress as a result of their use of digital technology, often known as technostress [40–42].

Consequently, it is expected that technostress has shifted to parents and caregivers as a result of their performance in the role of teacher in the distance learning environment. Therefore, it was hypothesised that:

**Hypothesis 3 (H3).** *A significant association exists between parents' technostress and parents' behaviours of support in distance learning activities.*

### 3.2. The Relationships of Parents' Self-Efficacy, Technostress and Behaviours of Support in Distance Learning Activities

When dealing with difficult parenting situations, parents who have high levels of self-efficacy are subject to less stress than parents with low levels of self-efficacy [49,50]. That is, parents with high self-efficacy have the potential to control and regulate their actions, suggesting parents' self-efficacy as an influential factor on both parents' technostress and their behaviours of support in distance learning. According to Tarafdar et al. [35], self-efficacy might operate as a moderating factor because the stressor condition related to technology affects the ability of individuals to use technology. In the context of distance learning activities, therefore, we propose that parents' self-efficacy in distance learning has the potential to moderate the relationship between technostress and parental involvement and, thus, influence their behaviours of support. Several studies have emphasised the positive influence of individuals' self-efficacy on minimising their perceived technostress [39,53,62]. For example, a study by Lee [63] investigated the association between early childhood teachers' technostress and teachers' self-efficacy and found that technostress was negatively associated with teachers' self-efficacy. Therefore, in the context of parents' self-efficacy in distance learning, we hypothesised that:

**Hypothesis 4 (H4).** *A significant association exists between parents' self-efficacy in distance learning activities and parents' technostress.*

Parents with high self-efficacy are anticipated to actively engage in the learning of their children and provide them with the appropriate support. In contrast, parents who lack self-efficacy often feel frustrated and pressured, which negatively affects their support behaviours toward their children [28]. Several studies have revealed that parents' self-efficacy is considered a determining factor in parents' levels of participation in guiding and supporting their children in online learning [19,64,65]. There are many obstacles that affect the level of confidence and ability of parents to manage distance learning materials, tools and techniques, for example, lack of training [10], difficulty dealing with digital technologies and, for some parents, lack of the necessary technical skills [6]. In a distance learning environment, level of skill and ability to handle digital technologies is related to the ability and confidence of parents to support their children and help them in distance learning activities [7]. Given the new nature of the distance learning environment in Saudi K-12 education, we attempt to examine how parents' self-efficacy affects parental involvement and their behaviours of support by testing the following hypothesis:

**Hypothesis 5 (H5).** *A significant association exists between parents' self-efficacy and parents' behaviours of support in distance learning activities.*

### 3.3. The Relationships of School Support, Technostress and Behaviours of Support in Distance Learning Activities

In their study, Duraku and Hoxha [48] explored the difficulties of distance learning, revealing that parents suffer from increased burden and stress due to additional commitments in monitoring children's online learning activities and constant communication with teachers and school administrators. Parents stressed the importance of improving the interaction between parents and teachers. With regard to technology use, building a close relationship between parents and schools is necessary for students' learning success in virtual education [6,25,40]. Partnerships between schools and parents in virtual

environments is required to ensure that parents have the necessary knowledge on how to facilitate a digital learning environment at home and how to handle it effectively. This, in turn, facilitates the transition and reduces the stress on parents resulting from dealing with digital technologies and their complexities (technostress) [6,40]. Lee [63] indicated the negative effect of technostress on teaching efficacy among early childhood teachers and emphasised the school's role to develop a comprehensive strategy to support teachers and help decrease the negative effects of technostress on teaching. As parents bear a great responsibility to educate and support their children through distance learning, it is expected that they will be vulnerable to technostress and, therefore, need support from the school to relieve this pressure, which will contribute to the success of their children's distance learning. Therefore, it was hypothesised that:

**Hypothesis 6 (H6).** *A significant association exists between school support and parents' technostress.*

The role of the school in supporting parents is considered one of the most critical factors affecting parental involvement in the education of their children, thus affecting the patterns of support provided for the learning of their children [51], especially in the distance education environment where the teacher is absent and the responsibility is centered on parents to provide the necessary support [19,56,66]. Many studies have indicated that the more support parents have from the school, the more they are involved and support the learning of their children [14]. For example, a study by Lee et al. [7] investigating parenting activities in distance education during COVID-19 found that most parents who felt unsupported were less likely to participate in and support their children's distance learning. According to Cole [65], parents determine whether or not to become engaged in the learning of their children depending on their perceptions of the school and teachers' invitations and support. Therefore, the seventh hypothesis was formulated:

**Hypothesis 7 (H7).** *A significant association exists between school support and parents' behaviours of support in distance learning.*

#### 4. Research Methodology

The current study investigated the influence of parental involvement in distance learning activities on parents' possible technostress and their behaviours of support toward their K-12 children's learning. Therefore, a quantitative descriptive approach using a survey questionnaire and partial least squares structural equation modeling (PLS-SEM) analysis were adopted to achieve the study's objective.

##### 4.1. Setting and Sample

The current study was conducted during the school closure period in Saudi Arabia as a result of the COVID-19 pandemic, where the Ministry of Education has shifted education to a distance mode through a digital platform called Madrasati for all levels of K-12 education. This situation necessitates parents to take charge of the learning of their children at home. Therefore, participants in this study were 651 parents or caregivers who had at least one student studying in K-12 distance education in Saudi Arabia (parents who do not have students at K-12 level or who have students at the university level were excluded from the study sample). The participants were 80.6% female and 19.4% male parents. Almost 94% of them indicated their relation to students as father or mother, while the rest indicated themselves as caregivers. The majority of respondents were from the age group 31 to 40 (51.3%), followed by the age group 41 to 50 (26.7%). Their education level included pre-graduate (obtained a high school certificate or lower), graduate and postgraduate, with the largest number of respondents (57.5%) being graduates who had obtained a bachelor's degree (see Table 1).



**Table 1.** Sample demographics ( $n = 651$ ).

Characteristic	<i>n</i>	%
Gender		
Male	126	19.4
Female	525	80.6
Age		
20 years old and under	12	1.80
21–30 years old	79	12.1
31–40 years old	334	51.3
41–50 years old	174	26.7
50 years old and over	52	8.00
Education level		
Pre-graduate	109	16.7
Graduate	374	57.5
Post-graduate	168	25.8
Relation		
Father/mother	611	93.9
Caregiver	40	6.10

#### 4.2. Instrument

Pre-existing questionnaire items were adopted for this study to measure K-12 parent/caregiver participants' perceptions about the five constructs proposed in the research model (shown in Figure 1), including parental involvement, parents' technostress, parents' self-efficacy, school support and parents' behaviours of support. To ensure content validity, the wording of questionnaire items was slightly modified to address the content of this study and revised by three assistant professors in the field of educational technology. The first section of the questionnaire collected participants' demographic information. The second section consisted of 41 items that measured the five constructs using a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = to some extent, 4 = agree and 5 = strongly agree). Table 2 shows the source, number of items and Cronbach's alpha of each construct (administrated on a pilot sample of 100). Each of the five constructs achieved a good ( $0.7 \leq \alpha$ ) or excellent ( $0.9 \leq \alpha$ ) level of internal consistency within the construct's items [67].

**Table 2.** Constructs in the research instrument.

Constructs	Measures		
	Number of Items	Source	Reliability (Cronbach's Alpha)
Parental Involvement (PI)	5 items	[6]	0.746
Parents' Self-Efficacy (SE)	7 items	[68]	0.865
School Support (SS)	9 items	[69]	0.891
Technostress (TS)	9 items	[36]	0.911
Behaviours of Support (BS)	11 items	[70]	0.925

#### 4.3. Data Collection and Analysis

The data were collected during the 2021 academic year from parents and caregivers of K-12 students involved in distance education in Saudi Arabia. First, an ethical approval from the Research Ethics Committee (REC), number (KFU-REC/2021-06-30) at our university was obtained, an electronic self-reported questionnaire was administrated via email and social network accounts to potential participants. Participants' agreement to submit their responses to the questionnaire was determined with informed consent that ensured privacy and confidentiality of participants. The questionnaire was available online for four weeks for participants to voluntarily agree to complete and submit. In determining a sample size, Weisberg and Bowen [71] indicated that when collecting electronic surveys

in the social sciences, a sample size of 400 is sufficient if an error level of 5% is acceptable. In this study, we exceeded this standard by collecting 651 responses, which represents a 4% error level according to Weisberg and Bowen's sample size criteria. The collected data were imported and tabulated using the SPSS version 26. Then, PLS-SEM was employed to analyse the data using Smart-PLS 3.0 software. According to Hair et al. [72], PLS-SEM analysis involves two main stages. First, to assess the measurement model, a confirmatory factor analysis (CFA) was performed. This includes calculating construct, convergent and discriminant validity. Second, the structural model is measured in order to examine the proposed relationships of its hypotheses.

## 5. Results

### 5.1. Measurement Model Analysis

The first step in assessing the measurement model is to assess the construct validity, which means the degree to which items measure the idea for which they are intended [67]. This was determined by calculating the indicator loadings for all items (shown in Table 3). According to Hair et al. [72], loadings greater than 0.7 are recommended. As seen in Table 3, all items achieved loading values of 0.7 or higher, which in CFA is considered acceptable for a good level of loading [67].

**Table 3.** Items' loadings and cross-loadings.

Factors	Items	PI	BS	SE	SS	TS
Parental Involvement (PI)	PI1	0.756	0.247	0.338	0.277	−0.126
	PI2	0.802	0.337	0.354	0.238	−0.120
	PI3	0.793	0.233	0.346	0.332	−0.181
	PI4	0.728	0.243	0.299	0.183	−0.064
	PI5	0.796	0.362	0.428	0.340	−0.172
Behaviours of Support (BS)	BS1	0.327	0.745	0.480	0.309	−0.131
	BS2	0.323	0.766	0.452	0.311	−0.116
	BS3	0.308	0.739	0.565	0.297	−0.142
	BS4	0.280	0.743	0.467	0.358	−0.101
	BS5	0.266	0.767	0.403	0.250	0.002
	BS6	0.309	0.823	0.504	0.344	−0.085
	BS7	0.271	0.773	0.420	0.291	−0.061
	BS8	0.278	0.795	0.467	0.310	−0.063
	BS9	0.195	0.760	0.363	0.187	−0.004
	BS10	0.289	0.761	0.491	0.251	−0.126
	BS11	0.384	0.797	0.589	0.380	−0.157
Parents' Self-Efficacy (SE)	SE1	0.365	0.447	0.706	0.338	−0.259
	SE2	0.355	0.415	0.779	0.404	−0.358
	SE3	0.375	0.504	0.716	0.381	−0.190
	SE4	0.316	0.542	0.762	0.301	−0.199
	SE5	0.400	0.468	0.772	0.431	−0.359
	SE6	0.365	0.416	0.748	0.441	−0.424
	SE7	0.352	0.523	0.728	0.386	−0.178
School Support (SS)	SS1	0.306	0.351	0.389	0.702	−0.218
	SS2	0.341	0.369	0.433	0.797	−0.234
	SS3	0.28	0.305	0.403	0.747	−0.222
	SS4	0.217	0.25	0.353	0.816	−0.211
	SS5	0.326	0.363	0.429	0.818	−0.252
	SS6	0.283	0.231	0.368	0.790	−0.233
	SS7	0.237	0.257	0.353	0.774	−0.213
	SS8	0.301	0.265	0.390	0.763	−0.239
	SS9	0.273	0.330	0.409	0.809	−0.254

**Table 3.** *Cont.*

Factors	Items	PI	BS	SE	SS	TS
Technostress (TS)	TS1	0.029	0.124	−0.039	−0.106	0.722
	TS2	−0.088	−0.012	−0.246	−0.265	0.776
	TS3	−0.085	−0.025	−0.259	−0.259	0.805
	TS4	−0.061	0.034	−0.180	−0.223	0.741
	TS5	−0.132	−0.054	−0.299	−0.209	0.826
	TS6	−0.031	0.015	−0.161	−0.159	0.798
	TS7	−0.167	−0.109	−0.339	−0.273	0.845
	TS8	−0.211	−0.191	−0.348	−0.235	0.735
	TS9	−0.224	−0.257	−0.342	−0.184	0.721

The second step is to measure the internal consistency reliability by calculating the composite reliability (CR) and Cronbach's alpha coefficient (CA). Table 4 shows that the CR of all items was between 0.883 and 0.941, while the values of CA varied between 0.790 and 0.923, indicating a satisfactory to good level of reliability (greater than 0.7) according to Hair et al. [72]. The third step is to examine the convergent validity of the five model constructs. This was addressed by calculating the average variance extracted (AVE) for all model constructs. Table 4 shows that all five constructs passed the recommended value of 0.5, suggesting that each construct accounts for 50% or more of its items' variance [72].

**Table 4.** Reliability and convergent validity analysis.

Factors	Items	Factor Loadings	CA	CR	AVE	R <sup>2</sup>	R <sup>2</sup> Adjusted
Parental Involvement (PI)	PI1	0.756	0.790	0.883	0.601	0.438	0.434
	PI2	0.802					
	PI3	0.793					
	PI4	0.728					
	PI5	0.796					
Behaviours of Support (BS)	BS1	0.745	0.923	0.941	0.593	0.438	0.434
	BS2	0.766					
	BS3	0.739					
	BS4	0.743					
	BS5	0.767					
	BS6	0.823					
	BS7	0.773					
	BS8	0.795					
	BS9	0.76					
	BS10	0.761					
	BS11	0.797					
Parents' Self-Efficacy (SE)	SE1	0.706	0.866	0.897	0.555	0.438	0.434
	SE2	0.779					
	SE3	0.716					
	SE4	0.762					
	SE5	0.772					
	SE6	0.748					
	SE7	0.728					

Table 4. Cont.

Factors	Items	Factor Loadings	CA	CR	AVE	R <sup>2</sup>	R <sup>2</sup> Adjusted
School Support (SS)	SS1	0.702	0.914	0.933	0.608		
	SS2	0.797					
	SS3	0.747					
	SS4	0.816					
	SS5	0.818					
	SS6	0.79					
	SS7	0.774					
	SS8	0.763					
	SS9	0.809					
Technostress (TS)	TS1	0.722	0.898	0.931	0.602	0.16	0.156
	TS2	0.776					
	TS3	0.805					
	TS4	0.741					
	TS5	0.826					
	TS6	0.798					
	TS7	0.845					
	TS8	0.735					
	TS9	0.721					

The fourth step aims to calculate the discriminant validity, which is defined as the degree to which a variable in the structural model differs empirically from other variables [72]. To achieve discriminant validity, the pairwise correlations between constructs should not exceed the square root of the AVE of all constructs [67]. Table 5 shows that discriminant validity was confirmed for the five model constructs in this study.

Table 5. Discriminant validity.

Constructs	BS	SE	PI	SS	TS
Behaviours of Support (BS)	0.770				
Parents' Self-Efficacy (SE)	0.636	0.745			
Parental Involvement (PI)	0.395	0.485	0.775		
School Support (SS)	0.402	0.515	0.376	0.780	
Technostress (TS)	−0.125	−0.38	−0.184	−0.302	0.776

## 5.2. Structural Model Analysis

In the first stage, the assessment of the measurement model was determined to be satisfactory. The second stage is to evaluate the structural model. The Smart-PLS 3.0 was implemented to examine the research hypotheses. Figures 2 and 3 show the path coefficient and the path coefficient with t-values, respectively. Table 6 presents the results of hypotheses testing, including all seven relationships proposed in the structural model.

Table 6. Hypothesis testing.

H	Independent Variable	Path	Dependent Variable	Path Coefficient (B)	Standard Error (SE)	t-Value	Decision
H1	Parental Involvement	->	Technostress	0.025	0.0018	0.519	Rejected
H2	Parental Involvement	->	Behaviours of Support	0.096	0.0016	2.331	Accepted
H3	Technostress	->	Behaviours of Support	0.150	0.0015	4.093	Accepted
H4	Parents' Self-Efficacy	->	Technostress	−0.315	0.0021	5.984	Accepted
H5	Parents' Self-Efficacy	->	Behaviours of Support	0.591	0.0017	13.737	Accepted
H6	School Support	->	Technostress	−0.149	0.0018	3.278	Accepted
H7	School Support	->	Behaviours of Support	0.107	0.0016	2.549	Accepted

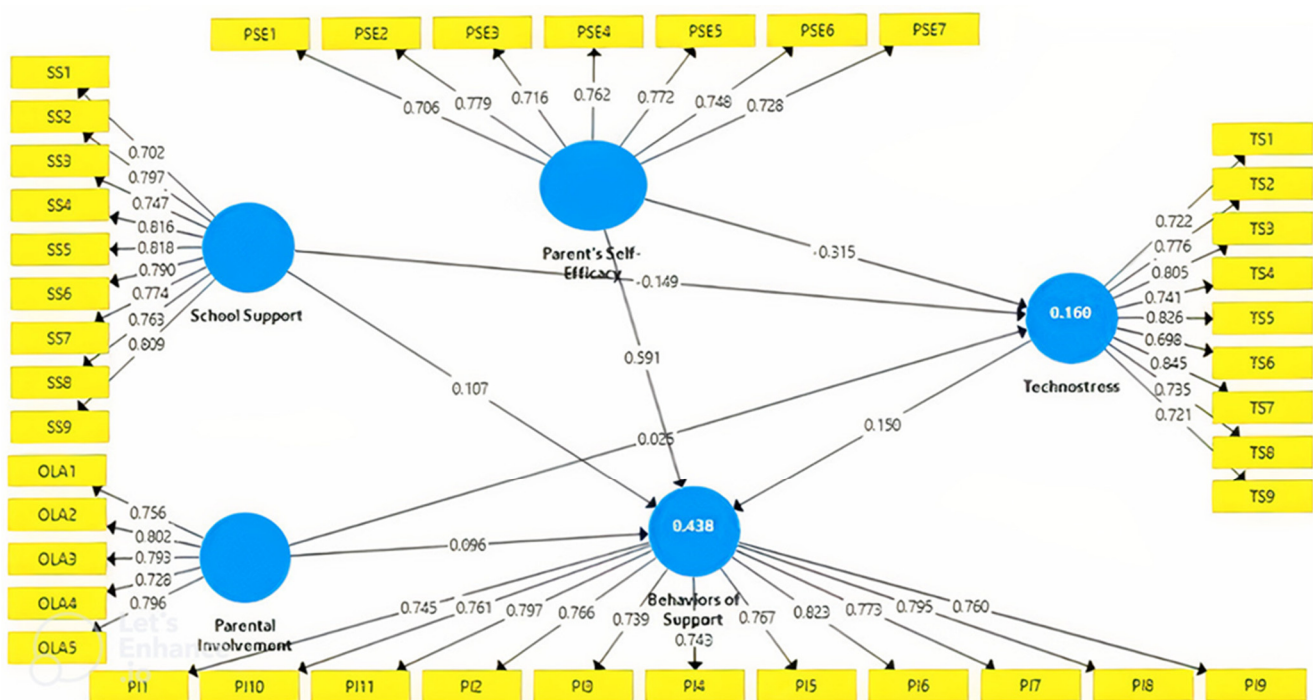


Figure 2. Path coefficient results.

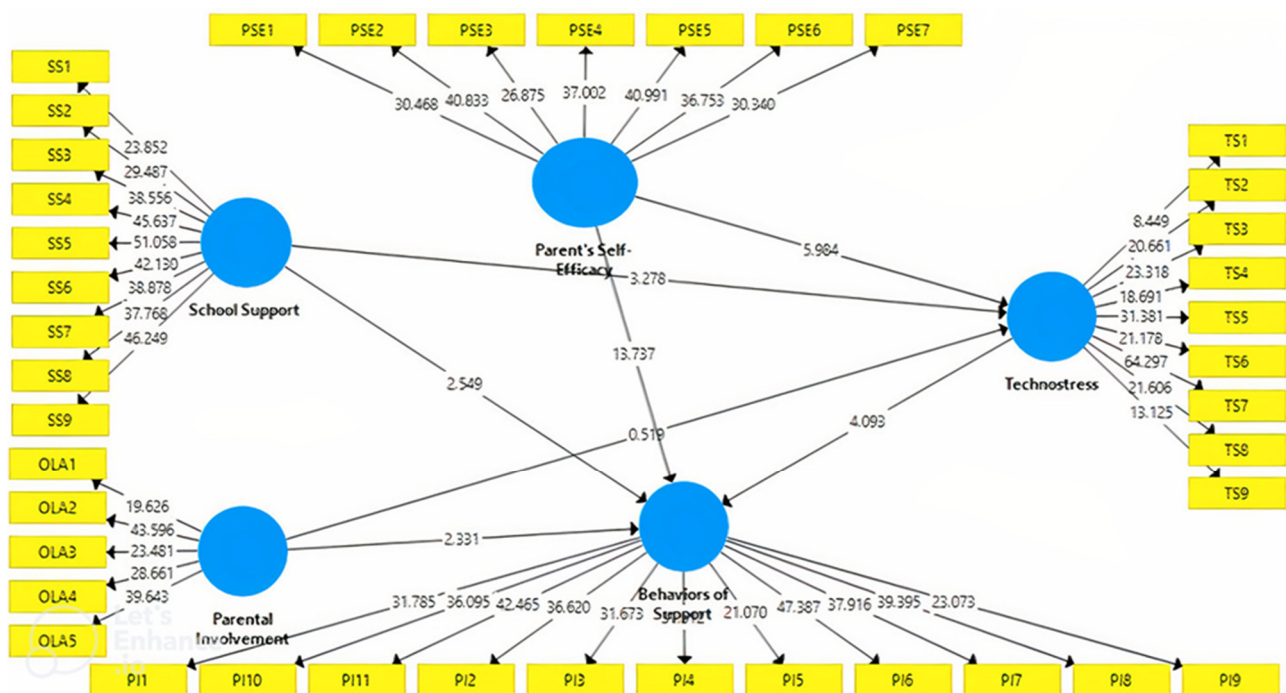


Figure 3. Path coefficient (t-values) results.

Regarding the first hypothesis (H1), the relationship between parental involvement in distance learning activities and their technostress ( $\beta = 0.025$ ,  $SE = 0.0018$ ,  $t = 0.519$ ,  $p > 0.05$ ) was not significant; therefore, this hypothesis was rejected. For the second hypothesis (H2), the proposed relationship between parental involvement and their behaviours of support toward the learning of their children ( $\beta = 0.096$ ,  $SE = 0.0016$ ,  $t = 2.331$ ,  $p < 0.05$ ) was positive and, thus, accepted. The third hypothesis was supported too, as the analysis indicated a significant and positive relationship between parents' technostress and their behaviours of support toward the learning of their children (H3) ( $\beta = 0.150$ ,  $SE = 0.0015$ ,  $t = 4.093$ ,



$p < 0.01$ ). The analysis also verified a significant relationship between parents' self-efficacy and their technostress as proposed in the fourth hypothesis (H4) ( $\beta = -0.315$ ,  $SE = 0.0021$ ,  $t = 5.984$ ,  $p < 0.01$ ); however, it was a negative relationship. Similarly, the sixth hypothesis (H6) was accepted, as the results confirmed a significant and negative relationship between school support and parents' technostress ( $\beta = -0.149$ ,  $SE = 0.0018$ ,  $t = 3.278$ ,  $p < 0.01$ ). The relationship between parents' self-efficacy and their behaviours of support proposed in the fifth hypothesis (H5) ( $\beta = 0.591$ ,  $SE = 0.0017$ ,  $t = 13.73$ ,  $p < 0.01$ ) was also positively supported. Finally, the relationship between school support and parents' behaviours of support indicated in the seventh hypothesis (H7) ( $\beta = 0.107$ ,  $SE = 0.0016$ ,  $t = 2.549$ ,  $p < 0.05$ ) was proven to be significant, and the hypothesis was accepted.

## 6. Discussion and Implications

This study examined the effect of parental involvement in distance learning activities on parents' technostress and behaviours of support toward the learning of their children. It also investigated the effect of parents' self-efficacy and school support on these relationships. Current study findings are discussed in the following.

First, results indicate that the relationship between parental involvement and technostress was not significant in this study, which does not support hypothesis one (H1). This means that the involvement of parents in distance learning activities with their children did not cause stress resulting from the continuous use of technologies (e.g., digital learning platforms). This result was unexpected and contradicts what is declared in the literature about parental involvement in distance education and the apparent effect of increasing technostress in parents [21,38,45,52]. This interesting result may be attributed to the fact that parents have increased their digital skills in this period of time due to the complete transition to digital spaces in all activities of working life [30] and become better adopters of using technology [15,25]; therefore, dealing with digital technologies was not stressful. Another reason that may explain this result is that distance education is a completely new experience for the Saudi K-12 educational context, so many voluntary initiatives have been put in place to increase parents' digital skills and provide support in how to deal with distance education activities [30]. Parents' involvement in these activities may have had the effect of not raising technostress. A useful implication of this result would be to draw the attention of the Ministry of Education to the importance of parents' digital skills and their impact on reducing parents' levels of technostress in order to achieve supportive engagement in the learning of their children when adopting distance or blended learning in the future.

Second, the study results asserted that parental involvement in distance learning activities was significantly and positively associated with parents' behaviours of support toward the learning of their children, which confirms hypothesis two (H2). This means that the more parents were involved in distance learning activities, the more parents were required to provide supportive behaviours for the learning of their children. This result aligns with the findings of previous research [14,16,54]. In distance learning environments, parents need to support the learning of their children by adopting the role of monitor, mentor and motivator for their children [25,57]. This result is considered important for decision makers in Saudi education, especially as the Ministry of Education has adopted blended learning as a future vision after the pandemic. Therefore, parents' knowledge and skills of supportive behaviour for their children must be enhanced in order to ensure the best educational outcomes. Accordingly, this result recommends that it is important to develop an intervention programme for parents focusing on how to adopt the best supportive behaviours for children's learning in distance education.

Third, it was found that a significant and positive relationship does exist between parents' technostress and parents' behaviours of support in distance learning, which supports hypothesis three (H3). Literature on how parents support their children in distance learning has emphasised that stressed parents found it difficult to manage and support their children's educational needs, impacting negatively on their learning performance [7,58,59,61].

In contrast to previous studies, the current study's results showed that the more technostress parents encounter from using distance learning environments, the more supportive behaviours they are willing to exhibit for their children's learning. Distance education in the context of K-12 in Saudi Arabia is an unprecedented experience, in which parents find themselves fully responsible for the education of their children and also potentially have doubts that their children have the confidence and competence necessary to deal with the new educational environment. These factors have prompted parents to display a high level of support behaviours including more monitoring, mentoring and motivating. In addition, this result may be attributed to a cultural factor, as parents in Arab countries care a lot about their children's education and are keen on high learning achievement. Furthermore, as Al Lily et al. [30] described, parents are overprotective of their children, so when distance education was introduced, parents were afraid of failure and educational loss. This result may also indicate that K-12 students lack self-directed and self-regulated learning skills to deal with distance learning; thus, parents took an active role in regulating the learning of their children. These reasons may explain the existence of a positive relationship between technostress and the increase in support behaviours by parents toward their children's distance learning. This result makes us question the quality of these supportive behaviours and whether they were present in order to take control of children's learning to maintain an educational level similar to traditional environments. An important implication of this finding is that future research should focus on investigating and understanding in depth the supportive behaviours demonstrated by parents toward their children in distance learning. In addition, this result implies that it is necessary for school leaders to develop programmes aimed at training students in self-regulated learning skills and raising their competencies in learning in digital environments.

Fourth, the results indicated that parents' self-efficacy when involved in distance learning activities had a significant association with both parents' technostress and their behaviours of support, which confirms hypotheses four and five (H4 and H5), respectively. For hypothesis four (H4), the relationship was negative, meaning that in distance learning, a lack of parents' self-efficacy resulted in an increase of parents' technostress. To put it another way, parents' confidence in their own ability to handle distance learning activities helped decrease the stress of using digital technologies (technostress). This result aligns with related literature on individual's self-efficacy and technostress [53,62,63]. For hypothesis five (H5), the relationship was positive, indicating a significant effect of parents' self-efficacy in maximising their supportive behaviours toward their children's distance learning. The results showed that parent's self-efficacy was the most important and highest in performance among the four factors in predicting parents' behaviours of support. Many studies have reported similar findings on distance learning [7,19,64,65]. Therefore, results from both hypotheses recommend active engagement of parents in training programmes that aim to increase their level of confidence and ability to deal with distance learning materials and tools, and thus contribute to reducing technostress and improving the supportive behaviours of parents toward the learning of their children [10]. This underlines the important role of the school in qualifying parents for distance learning, or even blended learning, and raising their level of competence and skills as parents to optimally utilise these learning environments for the better learning of their children.

Finally, the study results confirmed that school support had significant influence on parents' technostress and parents' behaviours of support toward the learning of their children, which supports the sixth and seventh hypotheses (H6 and H7). For hypothesis six (H6), a negative significant relationship was found between school support and parents' technostress. This means that the more support is provided to parents by a school's teachers and administrators, the less stressed parents will be about their involvement in distance learning activities with their children. This result aligns with previous studies in emphasising that close relationships between parents and schools reduces the burden and stress caused by their involvement in distance learning activities [6,40,48]. For hypothesis seven (H7), school support had a positive influence on parents' behaviours of support. This means

that the support provided by schoolteachers and leaders contributes significantly to raising the confidence and ability of parents to deal with distance learning environments and, thus, increases their ability to provide the appropriate and necessary support for the learning of their children. Many recent studies have emphasised the important and effective role of the school–parents’ relationship in the success of K-12 distance learning [7,14,51,65]. Therefore, as indicated by Kong [6], it is suggested that school leaders develop a comprehensive policy to handle parents’ issues in a practical manner to gain their support.

## 7. Conclusions and Limitations

This study explored parental involvement in distance learning activities and its effect on their technostress and behaviours of support toward their children’s learning. The study employed the P-T fit model and suggested a conceptual framework focusing on the role of technostress and suggested that lack of parents’ self-efficacy and school support influence this relationship. The findings of the present study revealed that parental involvement in distance learning activities prompted them to adopt more supportive behaviours toward their children in order to ensure successful education. These supportive behaviours have been found to be positively and significantly affected by the level of parents’ self-efficacy and the level of school support provided to them. With regard to the effect of parental involvement on their technostress, the results showed that this effect is not significant. Rather, the results revealed that the more stress parents experience from using technologies, the more supportive behaviours they display toward their children, which might be attributable to the novel experience of distance education in Saudi Arabia within the context of K-12, in particular the experience of dealing with digital educational platforms, as well as the lack of K-12 students’ self-regulated learning skills.

This study reported a number of limitations. First, the current study was conducted in the context of Saudi K-12 education. Conducting this study in other countries with different educational systems might reveal different results. Therefore, future research should examine the proposed model across different countries and educational settings (e.g., a cross-cultural study). Second, investigating the quality of supportive behaviours of parents toward their children’s distance learning was beyond the scope of this study. The findings of the current study have flagged the need for future research to understand how parents behaviourally support their children’s distance learning with more focus on cultural factors. Similarly, we need more future studies on the types of support provided by the school to parents so that they can appropriately monitor their children’s learning progress. Third, as the present study depended mainly on quantitative data, adding qualitative data would give greater depth in understanding the relationships in the proposed model, which would make the interpretations more thorough and, thus, lead to suggested implications that are more useful and feasible. Finally, follow-up research should consider extending the proposed model with other factors such as parents’ digital competency and peer support among parents and examine their moderating influence on parents’ technostress and their behaviours of support in distance learning.

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