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Parental digital competence and influences on parenting mediation

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Abstract

This study examines the changes in parental digital competencies and their influence on parenting styles in the context of the Covid-19 pandemic. Analysis of parental digital skills revealed that during the pandemic, very few parents acquired or improved their abilities in downloading and saving information, utilising learning applications, and Internet browsing to support their children's education. However, limited awareness of security settings and device security skills was evident. Parental mediation practices were found to be lacking in terms of active guidance and co-viewing activities, while restrictions and monitoring increased. These findings emphasise the need for increased parental awareness, education, and support to promote active mediation, encourage co-viewing, and balance restrictions and opportunities for online engagement in a digital age.

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1. Introduction

The Covid-19 pandemic globally affected the education of children with schools being shut, and education shifted to an online (Internet-based) mode. This caused an increase in the use of digital devices, and a need for more digital devices at homes so that the children could independently attend their classes (Rakib et al., 2022). The education system sought to turn digital at once, without leaving any choices to the various stakeholders involved in managing the crisis. The newly turned digital medium of education demanded parents' assistance in dealing with technology for their children's education, purchasing new devices for continuing education and Internet services, and supporting children with education in the new digital environment (Joseph et al., 2021). The pandemic also resulted in parents constantly monitoring the online activities of the children to ensure that the children were in fact studying. A study by Grover et al. (2022) found that the children had poor concentration and inadequate understanding of the concepts. The study also identified Internet surfing and participation in online competitions as the major distractions for children when attending online classes. The Covid-19 pandemic also added to the burden of parents by having them not only monitor the activities of the children, but also participate in the live classes (with children in elementary school), to motivate the students to attend the classes and learn effectively, and deal with the varied challenges of online education including infrastructure availability, Internet access, and detrimental effects of the increased screen-time (Misirli & Ergulec, 2021). Parents made a myriad of adjustments to accommodate online schooling of their children including organising schedules, participating in online chat groups and assisting with assignments (Budhrani et al., 2021); it was hard for the parents to constantly mediate the use of digital devices by their children (Michelson et al., 2021, Misirli & Ergulec, 2021). Parents being the primary mediators through which children inculcate digital media in their day-to-day life, from playing to studying safely and constructively (Benedetto & Ingrassia, 2020), the digital competence of the parents takes importance as parents ensure the responsible use of digital technologies.

After the outbreak of Covid-19, the Government of India announced a nationwide lockdown, similar to many other nations worldwide, and the struggles of the stakeholders of education in India were similar to those experienced in other parts of the globe. This study explores acquisition of digital skills and the digital mediation strategies practiced by the parents during the Covid-19 pandemic in the Kannur district in Kerala, India. The study draws a comparison between acquisition and mediation strategies practiced by parents during the three phases of pre-pandemic, during the pandemic, and post pandemic to understand the changes in the skills and abilities of parents to mediate the use of digital technologies by their children.

The subsequent sections of this article present a review of relevant literature followed by a note on the methodology followed. Subsequent to the methodology, the results are presented which are followed up with a discussion about the findings and conclusion.

2. Literature review

The abilities that people in modern society should possess are frequently highlighted using the term "digital competence" (Ilomäki et al., 2016). Digital competence may be understood as the personal capability and readiness to make confident, effective, critical, and safe choices that are the foundations of a system of knowledge, skills, motivation, and responsibility (Soldatova et al., 2020). Ilomäki et al. (2016) presented four components of digital competence: (1) technical competence; (2) the ability to use digital technologies in a meaningful way for working, studying, and in everyday life; (3) the ability to critically evaluate digital technologies; and (4) motivation to participate in and commit to the digital culture. The European Commission's Digital Competence Framework (Digcomp) introduced five components of digital competence: information and data literacy, cooperation and communication, the production of digital material, safety, and problem-solving (Carretero et al., 2017).

NCCA (2004) identified three arguments in favour of acquiring digital competence. The first argument relates to the benefits accruing from the integration of information and communication technologies (ICT) on students' learning achievements and motivation. The second argument recognises the pervasiveness of digital technology, and thereby the necessity to acquire digital skills to remain functional in the society (Eshet-Alkalai, 2004). This is particularly relevant in the case of adults who would have to learn the skills as opposed to children, who are born into the digital world (Vaterlaus et al., 2015). The third argument was a warning about the dangers of adults not acquiring and possessing the digital skills, while the children did. This was termed as "digital divide" (Irving et al., 1999). The Education Council of the European Commission (2006) included digital competence as one of the eight key life skills, along with

communication in native and foreign languages, basic competence in science, mathematics and technology, civic and social competences, and sense of entrepreneurship.

"Digital Competence is the set of knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socialising, consuming, and empowerment" (Ferrari, 2012). Digital competence also encompasses the ability of individuals to use technology confidently (Blackwell et al., 2014), critically, and responsibly (Ala-Mutka et al., 2008). However, the digital competence of different groups of people differs from one to the other. For instance, studies have shown that the digital competence of teachers and students varies, with students being more competent than their teachers (Kuzminska, et al., 2019).

Acquisition of digital competence may be understood as a mindset, allowing users to adjust to new demands imposed by developing technologies (Coiro, et al., 2008). Adults, however, do not acquire digital skills for various reasons including fear, lack of prior experience, and other physical limitations such as physical disabilities, distance, and health (Hill et al., 2015; Schirmer et al., 2023). Studies have also found that age, familiarity with technology, educational qualifications, and professions were also some of the determinants of the acquisition of digital skills among adults (Hinojo-Lucena et al., 2019). In terms of acquiring digital skills, Blažič and Blažič (2019) found that adults overcame their fear and gained familiarity in the use of digital devices by playing games on the tablets. The rise in mobile telephone use among adults and children has helped reduce the gap in digital skills among them (Vaterlaus et al., 2015) and promoted better learning by children due to the increased involvement of the parents in the education process (Lagunes & Lagunes, 2023; Michelson et al., 2021).

2.1 Parental involvement leads to higher educational attainment

Research studies have shown that the children whose parents were involved in the education process tended to have a lower school drop-out rate, a higher completion rate at high school and tended to attain higher educational qualifications than those children whose parents were not involved (Barnard, 2004). Parental involvement in the education of their children also resulted in the children getting into less trouble in school, attaining higher grades, and having good communication with peers (Menheere & Hooge, 2010; Spinellin et al., 2021). Boonk et al. (2018) identified the crucial factors of parental involvement that had a positive effect on children's educational attainment including reading at home, parental support towards children's education, setting high expectations regarding educational attainment, and regular communication between parents and children regarding schooling. Barger et al. (2019) argued that parental involvement in assisting children with homework negatively impacted the educational achievement of the children but observed that in all other aspects (such as academic adjustment, social adjustment, and emotional adjustment) parental involvement has a positive effect on children. Thartori (2018) observed that the educational attainment of the parents determined their involvement—the higher the educational attainment of the parents, the more was their involvement in their children's education. The degree of help parents could give their children in the use of digital technologies depended largely on their understanding of and their proficiency in using the technology to educate their children (Daniela et al., 2021).

2.2 Parental mediation of digital device use by children for education

Livingstone et al. (2015) highlighted that higher educational attainment of the parents translated to higher digital competence among them and, thereby, higher involvement even with the use of digital devices for education. The digital competence of the parents also translated into the early acquisition of digital skills by the children (Saçkes et al., 2011). Parents proficient in digital tools were more likely to urge their children to use Microsoft PowerPoint and the Internet to produce learning materials (Tran et al., 2020), even among children as young as six years (Pons-Salvador et al., 2022).

Parental mediation is "the varied methods through which parents attempt to manage and control their children's media encounters" (Benedetto & Ingrassia, 2020). Through mediation, parents play a significant role in educating children about the appropriate use of media (Bersamin et al., 2008; Rodríguez-de-Dios et al., 2018), and dealing with the challenges of being on the Internet, including disrespectful and inappropriate communication and security threats arising from passwords being hacked, spyware, misuse of personal information, harmful content, or online thefts (Soldatova et al., 2020).

Cabello-Hutt et al. (2018) identified three mediation strategies practiced by parents—active (also called instructive), restrictive, and co-viewing. Parents who talk to their children about the use of digital media and provide them with direction and advice are engaging in active or instructive mediation. Instructive methods were also prevalent and, in some cases, was the most popular method, particularly for those that involved talking with children about hazards (Kalinina et al., 2018). A wide range of parental behaviours and actions was identified in relation to encouraging, explaining, and educating children on how to use the Internet and its many applications (Rodideal, 2020). Regulating the Internet activity of teenage children is one way to be restrictive by using regulations, for instance, restricting access to content (Nikken & Jansz, 2014; Rodríguez-de-Dios et al., 2018; Soldatova et al., 2020). Children of all ages are subject to time, content, and geographical constraints when using the Internet, which is conceptualised as restrictive mediation (Rodideal, 2020). The phrases "control" and "guidance" are intercalated between active and restrictive mediation, with the premise that restrictive mediation can become active if it is assertively expressed, outlining and even arguing the limitations (Rodideal, 2020).

Co-viewing is when an adult is present while a minor is online, sharing the experience but refraining from expressing opinions on the material or its impact (Cabello-Hutt et al., 2018). Another means of parental mediation is monitoring—reviewing the Internet actions of the children at a later time. Parental activities that provide children with the freedom to use the Internet alone while assuring them that they are under the direct supervision of a nearby adult are called "supervision" (Nikken & Schols, 2015). Such interaction involves technical bans or filters (Cabello-Hutt et al., 2018; Dürager & Sonck, 2014; Nikken & Jansz, 2014). Cabello-Hutt et al. (2018) argued that parents who frequently used the Internet possessed a higher awareness of the potential hazards of the Internet and were more likely to mediate their children's use of digital devices through co-use and active mediation.

Parental mediation strategies can vary with the age of children. Parents of younger children, out of health concerns, indulge in restrictive and co-viewing mediation. Additionally, parents apply more active mediation and more general and content-specific limitations to their older children's online conduct. However, parents are less likely to exercise monitoring over older children (Nikken & Jansz, 2014). Permissive mediation, or laissez-faire parenting, is when parents only let their children access technology but do not supervise their online behaviour because they believe children are more capable of making good decisions (Warren & Aloia, 2019). Reverse mediation occurs when children act as their parents' digital socialisation agents and teach them how to handle digital issues that frequently occur with co-use (Rodideal, 2020). Modelling occurs when parents offer examples of screen use for children (Nwankwo et al., 2019). Inconsequent mediation is when parents react irrationally to their children's digital behaviour because they are unsure of their digital capabilities (Rodideal, 2020), while mixed digital mediation is where multiple digital mediation strategies are used simultaneously and develop, change, and overlap in daily family interactions. Mixed mediation has been shown to help lower cyberbullying participation by combining co-use, monitoring, and surveillance (Wright, 2017).

Parental mediation has also been perceived as being crucial for fostering positive outcomes while limiting adverse media effects and helping minors learn how to use and comprehend the media (Cabello-Hutt et al., 2018; Nikken & Schols, 2015). In this regard, active mediation may perform better than a restrictive mediation strategy. Active mediation is positively associated with digital options. It can help to prevent children's positive attitudes towards pornography and consumption or use of restricted goods such as narcotics and excessive consumption of alcohol and cigarettes, which are depicted positively by many media contents (James & Kur, 2020). Restrictive mediation helps lower online hazards at the expense of online opportunities and is negatively related to digital opportunities (Cabello-Hutt et al., 2018; Rodríguez-de-Dios et al., 2018). In this regard, online opportunities can include access to global information, educational resources, entertainment, social networking with friends, privacy for the expression of identity, content creation, and civic or political participation. In contrast, online risks can include illegal content or activities, sexual violence, bullying, invasions of privacy, offline predators, and cyberbullying. An increase in online opportunities allows for increased exposure to online risks (according to Cabello-Hutt et al., 2018).

2.3 Parental mediation during the Covid-19 lockdown period (CLP)

Schools were closed during the Covid-19 pandemic, and remote learning was initiated without prior notice. Garbe et al. (2020) found that parents faced significant challenges balancing their responsibilities, motivating their children for remote learning, ensuring accessibility, and maintaining expected learning outcomes.

During the Covid-19 lockdown, young children had to adapt to digital schooling, and their parents had to embrace digital parenting practices. Research by Cao et al. (2021) aimed to understand how Chinese parents (2,491

in number) viewed and managed their young children's early exposure to digital devices during these lockdowns. Chinese parents primarily saw their roles as guides (35.84%) and supervisors (32.04%) in managing their children's digital device use. They adopted four main digital parenting approaches: supervision, active mediation, restrictive mediation, and engaging in digital activities alongside their children. In another study by Zhang et al. (2021) on Chinese parents, they ended by implementing stricter, more restrictive mediation methods to counter Internet addiction and adopting co-use strategies to facilitate preteens' online learning.

Georgive et al. (2016) found that parents believed that children often possess a high level of competence in using digital technology and devices. Parental involvement and control over their children's online activities often needed to be improved. Parents were also found to have a liberal attitude towards their children's online activities, which exposed them to various risks.

Parents who increased their mediation tended to have more negative attitudes toward digital technology, lower digital skills, and more significant concerns about online risks. Conversely, parents who mediated less were less concerned about online risks, and their children spent more time online. The study found that parents' active and restrictive mediation led children to develop digital skills and spend more time online during the lockdown (Sciacca et al., 2022).

2.4 Parental digital competence in the Indian context

Digital technology is invading many parts of life in rural and urban centres in India. In 2016, there were 432 million Internet users, and by 2020, that figure was projected to nearly double to 0.73 billion (Patra et al., 2020), which was over half of the total population in 2020.

Joseph et al. (2021) found that Indian parents experienced helping their children in e-learning or remote learning for the very first time during the pandemic. Joseph et al. (2021) studied the experiences and satisfaction regarding remote learning of children who attended classes through WhatsApp, Facebook, and Gmail of 300 parents from India. It was noticed that Indian parents were often not prepared for this sudden transition. Due to the lack of children's and parents' orientations towards technology, the parents of primary children were less satisfied than secondary school students. According to this study, 69.3% of employed parents depended on others to ensure they attended online classes, while 61.1% felt home-schooling was burdening, as their presence was required for online classes with their children. The lockdown increased the screen time of parents and children, previously time being carried out outdoors (Agarwal et al., 2022). The study revealed that the pandemic was an opportunity for parents and children to learn digital skills, but in a rather complicated way.

In India, the Azim Premji University report titled "Myths of Online Education in 2021" was based on a study conducted in five Indian states: Karnataka, Madhya Pradesh, Chhattisgarh, Rajasthan, and Uttarakhand, covering 26 districts and involving 398 parents. The report revealed that 87% of those Indian parents had access to smartphones, but the children of parents at the lower education levels suffered the most during the lockdown, with no-one to help with their educational activities at home (Premji, 2021).

The Annual Status of Education Report (ASER, 2021), in its survey conducted across 25 states involving 76,706 households, reported an increase in the availability of smartphones from 2018 to 2021. Smartphone availability was found to be influenced by household economic position (as measured by parents' education level). As parents' education levels rose, so did the probability that their family would own a smartphone. In 2021, over 80% of children whose parents had studied at least through the ninth standard (secondary school in India) had a smartphone at home, compared to slightly over 50% of children whose parents had been educated only until standard five or less (elementary school).

The Oxfam India Report on the digital divide in 2022 used the CMIE (Centre for Monitoring Indian Economy) database of 236,000 households from January 2018 to December 2021 to study the digital gap affecting inequality, utilising a combination of quantitative and textual analyses. The findings showed that among the poorest households, 20% had access to computers and 9.9% to the Internet. Among the 20% of wealthy families, 27.6% had access to computers and 50.9% to the Internet. In India, 70% of households had no digital connectivity. Among households with members between the ages of 5 and 24 years, only 8% had Internet connectivity and computers. Overall, 80% of parents could not digitally support their students due to network and connectivity issues. The report also found that women used fewer digital devices and the Internet than men.

The expanding smartphone availability in Indian families does not imply that children will have access to a smartphone (ASER, 2021). In 300 families surveyed, more

than half of the parents (54.8%) were employed during the pandemic. Among them, 27.9% had difficulty sharing devices for their children's education, and 21.9% reported not having adequate devices (Joseph et al., 2021).

Notably, even among children whose parents had a 'poor' level of education, more than a quarter of households purchased a new smartphone for their studies since the lockdown began in March 2020 (ASER, 2021).

2.5 Rationale

Adolescents have access to various sources from which they can learn, and being born and brought up in the digital age can make it easier for them to adapt to using digital technologies. However, parents must also be digitally competent to support their children effectively. Studies in previous sub-sections of this paper have shown that parental mediation is vital in how children perceive media positively and negatively. Positive beliefs and attitudes about digital devices encourage children to use them regularly and effectively. Conversely, negative parental attitudes can limit children's online activities and influence their future digital behaviour (Benedetto et al., 2020).

While parents' digital competencies may not directly influence adolescents' digital skills (Soldatova et al., 2020), parents must possess digital knowledge to help their children navigate online risks and challenges efficiently. Parental restriction and lack of digital knowledge can result in a loss of digital opportunities for children. Therefore, parents must understand and mediate accurately when dealing with digital technologies.

Numerous studies recommend improving parents' digital skills and equipping them with tools for parenting in the digital age (Cabello-Hutt et al., 2018). Parents must be digitally competent to recognise and address online risks beyond financial concerns, and by being digitally skilled, parents can better assist their children in tackling online problems and prevent potential manipulation.

To bridge the so-called digital gap between parents and children, parents must be more adept and aware of the hazards related to ICT use compared to their children. Digital parenting is relevant for children of all ages, as various cyber risks await them (Tosun & Mihci, 2020). Children spend significant time on digital media at home (Joseph et al., 2021), so parents must guide them in integrating technology responsibly into their daily lives.

While parents may well have been learning digital skills over the years, especially during the post-pandemic period (Benedetto et al., 2020), there is a need to study how these changes in digital competence impact parenting styles and mediation. Effective parental mediation can create online opportunities for children while providing them with guidance on online risks (Soldatova et al., 2020).

To our knowledge, there are no studies on digital competence and how it influences parental digital mediation in India. Further research is warranted to explore the relationship between parental digital skills and their mediation practices in the Indian context. India being a country with diverse cultures and languages, and taking into account the resource constraints, this study is restricted to the district of Kannur in the state of Kerala.

3. Methodology

3.1 Research objectives

1. To understand the changes in digital skills/competencies acquired by parents pre- and post-Covid.

2. To understand if attaining digital skills/competencies has changed parental mediation strategies (whether restricted, active, co-viewing or monitoring).

3.2 Demography

The study was conducted in the Kannur District, in the State of Kerala. According to the 2011 census, the District's population accounted for around 7.56% of the overall population of the State. The District has a population of 2,523,000, with 882,000 living in rural areas and 1,641,000 residing in urban areas. The number of children aged 0 to 6 years in the District is 274,318, accounting for 10.87% of the total population. The rural population accounts for 34.95% of the overall population in the District, while the urban population accounts for 65.05%. Kannur (Cannanore) District has a literacy rate of 95.10%. The male literacy rate in Kerala's Kannur district is 97.19%, while the female literacy rate is 93.29%. Kannur District has a total of 2,138,434 literates.

Regarding digitisation, Kerala has the second-highest Internet penetration rate in India (54%), according to the Internet and Mobile Association of India's (IAMAI) study entitled "India Internet 2019" (Kerala Development Report, 2021). Due to the state government's diverse new initiatives

and projects in digitalisation, Kerala has become the first fully digital banking state and fully e-governed state ('Kerala Becomes Country's First Fully Digital Banking State', 2023; Piyush, 2023).

3.3 Participants

This exploratory study undertook a qualitative approach to determine changes in parental digital competencies and their influence on parental mediation strategies with their children on digital devices. A convenience sample of 15 parents was chosen for the study. The children of these parents were in the age group of 6 to 16 years at the time of the study. All the participants of this study had an annual income of less than INR 100,000 (verified against government ID) and were residing in rural localities of Kannur, Kerala.

3.4 Instrument design and measures

A semi-structured interview schedule was formulated to study the parental digital competence and parental mediation of children regarding digital devices. The interview schedule was based on established survey instruments developed by Rodríguez-de-Dios et al. (2018), Nikken et al. (2011) and Zhang and Livingstone (2019).

Rodríguez-de-Dios et al.'s (2018) survey questionnaire encompassed questions on technological or instrumental skills (the capacity to use digital technologies effectively), communication skills (the capacity to communicate through digital technologies), information skills (the capacity to locate, acquire, and assess relevant information in the digital environment), critical skills (the capacity to evaluate the information obtained critically), personal security skills (the capacity to manage privacy online and ensure personal safety), and device security (i.e., the capacity to take preventative measures to keep digital devices secure and avoid possible dangers like viruses and spyware). Nikken et al.'s (2011) and Zhang and Livingstone's (2019) questionnaires attempted to comprehend parental mediation including active, co-viewing, restrictive, and supervision strategies. The questionnaires required respondents to rate their agreement on a 5-point Likert scale. The survey instruments could not be used directly as the questions were not suited for the Indian context.

Furthermore, during the pilot study, to administer the survey instruments, it was observed that deeper insights into competence and parental mediation were not emerging in the context of Covid-19 and post-Covid lifestyle. Thus, the survey instruments were converted into semi-structured interviews and contextualised for the Indian context. The statements about computer usage were omitted, as the parents did not possess laptops or desktop computers. Some statements were removed or combined due to their technologically advanced nature, which were not suitable for the participants as they did not possess advanced technological skills. Some statements regarding parental mediation strategies were restructured by combining and splitting certain items from Nikken et al.'s (2011) and Zhang and Livingstone's (2019) instruments. For instance, mediation strategies concerning social media sites like Facebook and WhatsApp were addressed separately. This approach was adopted to facilitate conceptual clarity for the respondents and to elicit more comprehensive and detailed responses regarding their mediation practices specific to each platform.

The semi-structured interview schedule framed for this study also collected information about parental roles (father/mother/guardian), employment status, educational qualifications, number and ages of children, the number of digital devices in their households, and digital devices owned by both parents and children.

3.5 Data collection

Semi-structured interviews were conducted in person, with voluntary participation from the fifteen parents (14 mothers and one father). The questions were read out to the parents in their vernacular to ensure that the questions were understood correctly. All questions about digital competencies and parental mediation strategies were covered, and additional questions were posed based on the responses to elicit deeper insights or to gain clarity regarding their responses. Prior informed consent was obtained to audio-record the responses with explicit notations of explanations provided by participants for open-ended questions. Each interview session lasted about 45 minutes.

3.6 Data analysis

Content analysis is "any technique for making inferences by objectively and systematically identifying specified characteristics of messages" (Holsti, 1969). Large amounts of data can be systematically examined with reasonable ease using content analysis (General Accounting Office, 1996). Content analysis is also helpful in detecting underlying themes and patterns in documents and makes it easier to observe changes in how concepts are perceived (Stemler, 2001).

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Content analysis was used to analyse the interviews. While the direction of the discussion was set in the semi-structured interviews, the coding scheme allowed themes to emerge from the responses (Holton, 2007).

4. Results

4.1 Parental digital competence

The parents' technological, information, security, and critical skills were assessed based on the questionnaire developed by Rodríguez-de-Dios et al. (2018). The results are presented in Table 1.

4.2 Parental mediation

Research Question 2 asked: Has acquiring digital skills/competencies altered parenting styles, specifically in terms of active or restrictive?

Table 2 reports the data analysis that represents the presence or extent of the characteristics of different types of parental mediation practised by parents in their children's digital device use (as outlined in the methodology section).

Table 1. Results of parental digital competence

Dimension	Variables	Phase	Summary	Excerpts from Interviews
Technological skill	Downloading and saving information/ photographs	Pre-CLP (Covid Lockdown Period)	None of the parents reported using this technological skill before the Covid-19 lockdown period. Only two parents reported knowing about downloading and saving photographs and information but had yet to use it practically.	*"No need for doing; my children do themselves."* *"No, sometimes my sister helps download."*
		During CLP	Three parents acquired this skill during the pandemic, primarily to provide more support to their children during the CLP.	*"During Covid, I started helping more. Initially, children needed help to do their homework; they could not do it alone at home. So I had to help."*
		Post-CLP	The data suggest that downloading of information was acquired by 5 out of 15 parents during the Covid-19 lockdown period (CLP) to help their children with remote learning. The parents have reported continuing the skill post-pandemic too. Other parents did not acquire these skills stating that they had no necessity to learn the skills	*"Yes. I download photos for my child's project"* *"[I download] beautiful scenery, stitching design for clothes, important news"; "pictures on interiors, crafts and anything important"* *"[We] never felt the need to learn"* *"Our children know everything; they can do everything on the phone. If we need anything, they do it for us"*
Connection to Internet/ Wi-Fi		Pre-CLP	While most parents, 14 out of 15, reported being acquainted with smartphone connectivity, there was a notable lack of proficiency in laptop Internet connectivity.	
		During CLP	A single parent reported knowing how to connect their laptop to the Internet or Wi-Fi. The laptop was purchased exclusively for their child's education during the Covid-19 period. While acquiring a smartphone specifically for educational use during Covid, one parent expressed reluctance to acquire the necessary connectivity skills, relying on their child.	*"My children know everything and do everything on the phone. So I never felt the need to learn"*

Table 1. (cont.) Results of parental digital competence

Dimension	Variables	Phase	Summary	Excerpts from Interviews
		Post-CLP	Out of the 15 parents interviewed, 14 knew how to connect their smartphones to the Internet/Wi-Fi connection.	
Installation of new smartphone applications and their usage		Pre-CLP	All parents felt no need to download and install new smartphone applications.	*"We hardly used the phone, only used to call, no applications were used, now everything needs one or the other application."* *"I do not remember any applications we used before the pandemic. It is only after Covid-19 phones and new apps usage increased."*
		During CLP	Parents learnt how to use mobile banking applications for monetary transactions and e-commerce mobile application for online purchases. There was also an increase in the use of YouTube usage for educational purposes.	*"My Husband is working in Gulf, and he sends money through G Pay."* *During Covid, groceries for the home were ordered from home; during home delivery, they preferred G Pay or Phone Pe so had to install G Pay."* *"I work in a shop; during Covid, payments were made by Phone Pe or Gpay. So I had to install these applications to receive payments."*
		Post-CLP	Parents had to adapt to digital devices, particularly for their children's educational needs. However, there also remains a reliance on children's assistance for installing new applications (9 parents out of 15) and online shopping (2 out of 6).	
Information Skills	Browsing the Internet to help children	Pre-CLP	None of the parents reported helping their children in their studies through browsing assistance before the pandemic.	
		During CLP	During the Covid-19 pandemic, five parents learned to browse the Internet to aid their children with homework and projects. Two parents acquired browsing skills with their children's help, two self-learned, and one parent received assistance from her sister. The reasons mentioned included excessive online classes during Covid-19, using the Internet and YouTube videos to help their children understand concepts, and assisting with homework and projects during the pandemic. Parents also assisted their children in accessing information online by doing it themselves to ensure that their children did not waste time on unproductive online activities like playing online games.	*"Excessive online classes during Covid. When they do not understand anything in classes, I look internet and videos on youtube, and I help my children."* *"To help them (my children) with homework and projects during Covid, I learnt from my sister."* *"If I give the phone to him, he will watch videos and play games, waste time. Instead of looking at educational videos, I search and give him the required for his classwork."*
		Post-CLP	-	

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Table 1. (cont.) Results of parental digital competence

Dimension	Variables	Phase	Summary	Excerpts from Interviews
Difficulty in browsing?		Pre-CLP	-	
		During CLP	Not all parents learnt to browse the Internet to access information. Commonly cited reasons included fatigue, lack of know-how to use the Internet, and discomfort in reading information on a digital device. A few parents who learned to browse the Internet to assist their children with homework during the Covid-19 period reported uncertainty in searching as a reason for finding browsing difficult.	*"I always feel tired when I try using."* *"I do not know exactly to find the information."* *"Not comfortable using the internet… you do not get all information at a place. Feel comfortable reading books, the newspaper."* *"I find difficulty in searching, do not know where to find the information."*
		Post-CLP	A majority of the parents (10 out of 15) reported that they did not frequently use the Internet to help their children with homework or assignments before and during the pandemic.	*"My children check YouTube if they have any doubts. They know better; they don't require my help."* *"They do not need our help. Instead, we have to learn from them."*
Security Skills		Pre-CLP	None of the parents mentioned operating any privacy settings in WhatsApp and Facebook indicating that they were unaware of the settings. None of the parents mentioned having heard about cybersecurity scams before the pandemic.	
		During CLP	During the pandemic, six parents reported being acquainted with privacy settings of keeping status and profile pictures private in WhatsApp. Eleven out of fifteen parents reported hearing about scams during the pandemic.	
		Post-CLP	Six parents out of fifteen knew about privacy settings to keep status and profile pictures private on Whatsapp. However, the parents were not conversant with advanced security features such as setting PINs or passwords for their WhatsApp accounts for additional privacy and blocking accounts for additional security. Among the parents surveyed, only two had Facebook accounts, but they refrained from posting anything on the platform, thereby avoiding the need to learn about privacy settings. None of the parents knew about the Report Abuse button for posts, content, or accounts on the platform. Parents had heard and read about scams in newspapers and seen the news highlighting the various fraudulent activities circulating on social media platforms.	*"No, I only have an account on Facebook; I never post but simply look at what others post. I do not use much of Facebook."* *"I have Facebook, never post, just look at videos and others' posts.* *"I do not know anything else about Facebook."*

Table 1. (cont.) Results of parental digital competence

Dimension	Variables	Phase	Summary	Excerpts from Interviews
Device security skills		Pre-CLP	None of the parents mentioned hearing about antivirus, spyware and malware. Four of the parents surveyed had email accounts, but they needed to become more familiar with the concept of spam mail to avoid potential issues. Similarly, the parents had yet to hear about spam messages on WhatsApp.	*"No, I have not heard about spam mail… or messages."* *"No, I am hearing about this for the first time now."*
		During CLP	Among the surveyed parents, very few (four out of fifteen parents) had heard about antivirus software; their children were the source of this information. However, despite hearing about antivirus, these parents would need a deeper understanding of its functions. Eleven out of fifteen parents reported hearing about spyware and malware; they recall coming across information about spyware and malware from news sources.	*"I have heard about spyware in the news during Covid. I do not remember, but I have heard about it."* *"I know it [malware] attacks our phone, and our bank details are leaked."*
		Post-CLP	The parents reported learning nothing new other than existing knowledge	
Critical skills		Pre-CLP	Before the pandemic, none of the parents checked the accuracy of information online.	
		During CLP	5 out of 15 parents reported verifying the accuracy of online information during lockdown. They verified information by referring to multiple sources. These parents learnt on their own.	*"Yes. I check multiple sources."* *"Yes, I check multiple websites and cross-check with books and newspapers if possible."* *"I only teach the content found matching with the textbook. I also check YouTube videos like Xylem".* *"I check with YouTube videos suggested by schoolteachers, my friends and children's friends during PTA."*
		Post-CLP	5 parents out of 15 reported checking if the online information was correct. Only 2 out of these 5 parents checked if the general information was correct, and the remaining parents checked the accuracy of the content to be taught to children.	

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Table 1. (cont.) Results of parental digital competence

Dimension	Variables	Phase	Summary	Excerpts from Interviews
Communication skills	Whatsapp Usage	Pre-CLP	Parents spent an average of 1 to 2 hours daily on Whatsapp.	
		During CLP	Parents reported using Whatsapp for communication, downloading and sending homework in class groups and to teachers, and watching and downloading videos and photographs. The parents spent an average of 2-3 hours daily on WhatsApp communicating with their friends and actively participating in WhatsApp groups.	
		Post-CLP	Parents reported knowing how to send and download photographs, videos, documents, and voice notes in WhatsApp. Parents mentioned spending an average of 3-4 hours daily on Whatsapp.	
	Email Usage	Pre-CLP	None of the parents reported having email accounts.	
		During CLP	Four parents mentioned opening an email account during the pandemic	
		Post-CLP	The four parents who had email accounts rarely used them.	*"I open it rarely when documents from Akshaya (regarding bank, phone service) are sent to my mail." "I have an email account, opened it while buying a new phone, but never use it."*
	Use of digital devices to communicate with teachers	Pre-CLP	Parents reported using telephone calls through digital devices for communicating with teachers	
		During CLP	Parents reported using Whatsapp and Whatsapp groups to communicate with teachers and other school authorities during the pandemic.	
		Post-CLP	All parents reported using digital devices to communicate with teachers. All the parents reported communicating with teachers through WhatsApp. Absentees, early leaving of classes, special classes, examination schedules, and students' performance in examinations were posted in the groups, including other important information.	

Table 1. (cont.) Results of parental digital competence

Dimension	Variables	Phase	Summary	Excerpts from Interviews
Screen time, health, and device usage		Pre-CLP	Parents did not worry much about screen time as the children spent a lot of time in school and the parents permitted limited access to television, mobile telephones, and computers at home. The limited time was further enabled by the lack of time for the children between two school days. Parents mentioned that children never or rarely used digital devices for playing and studying.	
		During CLP	Parents were concerned by the increased screen-time of their children as their classes had shifted to online mode. All the parents mentioned an increase in the use of the Internet and digital devices during the pandemic.	*"I do not know what will happen to their eyes. I wonder, will they have to wear spectacles in higher classes? Now, the eldest is saying of pain in eyes sometimes."* *"I tell them, if they use the phone like this [excessive use], they will lose their eyesight soon."* *"He will sit with his phone in one corner. He does not listen; the phone's light can cause eyesight problems and issues with sleep."* *"During the pandemic, they could not go outside to play. They played with phones then."*
		Post-CLP	The concern of the parents continued as the children became accustomed to the use of digital devices at home. All the parents (fifteen) reported that children had increased Internet use on digital devices. Five parents did not mention the number of hours spent on digital devices by children. Words like "always on the phone" and "full day on the phone" were used. Another (9) parents mentioned 2 to 2.5 hours spent on digital devices on school days. On weekends and holidays, an average of 5-6 hours were spent by children on the smartphone, as mentioned by parents.	*"[The] eldest one full time is on the phone. He says he is studying. Who knows? Sometimes they [siblings] watch videos together, and when they see me coming, they move apart."* *"Post Covid... internet usage high. I use 300 MB, and my child uses 700 MB per day."*

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Table 2. Parental mediation strategies

Phase	Dimension	Variables	Summary	Excerpts from Interviews
Pre-CLP	Active Mediation	Explaining to children the rules of conduct regarding contact with online strangers and online risks		
		Explaining to children about responsible and safe social media behaviour		
		Explaining to children about responsible and safe use of Instant Messaging applications		
		Tell children to explore or suggest Internet/ software/applications and use them beneficially		
	Co-viewing	Share activities on digital devices		
	Restrictive	Restricting unsuitable online games/websites/videos, allowing children to access specific content genres only		"There was no need, as children rarely used digital devices for playing and learning before lockdown."
		Digital devices as reward or punishment		
	Supervision	Specifically, allowing children to use devices in their presence		
		Controls, firewalls application		
		Keeping time limits		
		Checking browsing history of children after their usage		
During CLP	Active Mediation	Explaining to children the rules of conduct regarding contact with online strangers and online risks	None of the parents mentioned discussing with their children the rules of conduct online during the pandemic despite the increase in usage of children's and parents' digital devices	
		Explaining to children about responsible and safe social media behaviour	None of the parents reported explaining how to behave on social media to their children during the CLP and Pre-Covid.	

Table 2. (cont.) Parental mediation strategies

Phase	Dimension	Variables	Summary	Excerpts from Interviews
		Explaining to children about responsible and safe use of Instant Messaging applications	All 15 parents mentioned that children started using Whatsapp for educational purposes during the pandemic remote learning. During that time, no parents discussed the rules on Instant Messaging applications such as WhatsApp.	"They use Whatsapp class groups, where the teacher posts class notes, homework and other important classroom announcements." "Teacher posts class notes and homework, projects in Whatsapp, that time I give them a phone."
		Tell children to explore or suggest Internet/ software/applications and use them beneficially	None of the fifteen parents practiced encouraging children to explore the Internet or suggested any beneficial applications, software or websites during the CLP.	
	Co-viewing	Share activities on digital devices	The majority of the parents did not participate in shared activities with their children.	"No time for doing it." "I do not know anything… not interested in playing games; I do not understand what they are watching." "She watches makeup and craft videos. I only watch cookery or serials. I am not interested in that."
	Restrictive	Restricting unsuitable online games/websites/videos, allowing children to access specific content genres only	The four parents reported starting restrictions during the pandemic when children started using digital devices more for learning and other purposes.	
	Supervision	Specifically, allowing children to use devices in their presence	Three parents reported supervising children's digital device usage during the pandemic when children started using digital devices more for learning and other purposes.	
		Controls, firewalls application	None were reported.	
		Keeping time limits	Six parents mentioned keeping time limits for their children.	

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Table 2. (cont.) Parental mediation strategies

Phase	Dimension	Variables	Summary	Excerpts from Interviews
		Checking browsing history of children after their usage	None were reported.	
Post-CLP	Active Mediation	Explaining to children the rules of conduct regarding contact with online strangers and online risks	None of the fifteen parents had heard about cyberbullying, online harassment and disturbing content or their children encountering such negative situations online, so they believed their children were safe.	"No, I have not heard of anything like that… nor have my children ever told me about it." "No, I did not hear about this from my children or anyone anywhere." "They know everything. They hear many things and are aware. We warn them and trust that they will not do anything wrong." "They need not be told; they know everything."
		Explaining to children about responsible and safe social media behaviour	During the interview, four parents mentioned their children using Facebook, and two out of four said their children are using Instagram too. None of the parents mentioned talking to their children about behaviour on social media.	
		Explaining to children about responsible and safe use of Instant Messaging applications	During the interview, 12 parents mentioned that none of their children own telephones to have WhatsApp. The remaining three parents said their children have telephones and use WhatsApp.	"They use WhatsApp class groups, where the teacher posts class notes, homework and other important classroom announcements." "Teacher posts class notes and homework, projects in WhatsApp, that time I give them a phone."
		Tell children to explore or suggest Internet/ software/applications and use them beneficially	None of the parents out of 15 asked their children to explore or suggest Internet/software/ applications used beneficially post-lockdown.	"They know everything." "They search themselves whatever is needed; they do not need to be told."

Table 2. (cont.) Parental mediation strategies

Phase	Dimension	Variables	Summary	Excerpts from Interviews
	Co-viewing	Share activities on digital devices	None of the fifteen parents mentioned doing shared activities on digital devices with their children post the Covid Lockdown Period.	
	Restrictive	Restricting unsuitable online games/websites/videos, allowing children to access specific content genres only	Four of fifteen parents mentioned restricting their children from excessive online gaming and video watching. The restrictions are mostly conveyed vocally or by taking away the device being used.	"Watching videos and playing games after covid from children has increased. I take the phone away." "Yes… I tell them not to download and play games, but they do not listen." "When he is watching youtube for long hours, I scold him. I tell him to keep the device down on this table. Sometimes he keeps." "I told him not to download and watch any unwanted sites, videos, or pictures." "I ensure they do not watch certain other videos on YouTube but only watch Kochu TV." "They ask to watch YouTube, Makeup videos, and Eating channels. They watch that; I check in between what they see to ensure they do not watch anything wrong." "I allow him to watch YouTube. I closely watch what he is doing… He only watches on YouTube cardboard craft videos and Kochu tv. I do not allow them to leave the home with the digital device." "They know better than us. We do not have time to monitor their actions, but we have told them not to do anything wrong."

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Table 2. (cont.) Parental mediation strategies

Phase	Dimension	Variables	Summary	Excerpts from Interviews
		Digital devices as a reward or punishment	Parents do not use digital devices as rewards or punishments.	"They will not misuse; we believe them." They do not listen to us if we keep time limits. They will not listen." "No point in keeping such rules. If we try to keep them, they will not listen, but I only say one thing they should inform and take the phone."
	Supervision	Specifically, allowing children to use devices in their presence	Parents keep a close eye on the content being consumed by the children.	"They ask to watch youtube, Makeup videos, and Eating channels. They watch that; I check in between what they see to ensure they do not watch anything wrong." "I allow him to watch youtube. I closely watch what he is doing.. .He only watches youtube cardboard craft videos and Kochu tv. I do not allow them to leave the home with the digital device."
		Controls, firewalls application	None were reported.	
		Keeping time limits	Parents practiced limiting the usage time of the digital devices by their children.	"They ask my permission to use, and once their work is done, they should keep it back." "I allow them to use devices when they ask me, and after they do, they should keep back".
		Checking browsing history of children after their usage	None were reported.	

5. Discussion

In this section, the discussion of the results about parental digital competence and parental mediation strategies is presented.

5.1 Parental digital competence

This study aimed at examining the changes in the digital competencies of parents before, during and after the CLP (Covid Lockdown Period) and if the changes influenced parental mediation strategies on digital devices towards children. The Covid-19 pandemic and subsequent lockdown

had an impact on the digital skills of parents. During this period, parents were forced to adapt to online education for their children.

Overall, parental digital competencies improved during the CLP. About a third of the participants agreed that they acquired new technological skills, including downloading and saving information from the Internet, installing payment applications such as PhonePe and Google Pay, online shopping applications such as Flipkart and Meesho. Parents also reported acquiring information skills (browsing of information) and critical skills (cross-verifying to check correctness of information available online). Fourteen of the 15 parents expressed high proficiency in communicating through WhatsApp and were using it to actively communicate with teachers to monitor their children's educational progress.

While about one-fourth of the participants mentioned that they did not use email due to their lack of knowledge, the majority of the parents were conversant with YouTube to search for educational content for their children. This uptrend in the use of YouTube and WhatsApp could be due to the user-friendliness of the programs (Goedhart et al., 2019). However, this study showed that few participants performed the critical skill of cross-referencing the information, though they had the digital competency to do so.

In terms of the process of acquisition of digital skills, the participants reflected that they sought assistance from their children, friends, and relatives. This is in consonance with Goedhart et al.'s (2019) findings that informal assistance from children, other family members, and friends is easily accessible for mothers who seek help to learn digital skills. Some participants did acquire proficiency in technological and information skills, owing to the long period of the pandemic and their own necessity for learning the skills. However, the majority also said that their children were supporting them in the use of technology (such as online shopping) and therefore they did not learn to do such tasks independently. Dependency on children to support technology related tasks appeared to negatively affect the ability of the parents to monitor the usage of the devices and implement device and parental security measures to prevent misuse of technology by their children. None of the participants were even aware of cyberbullying, scam messages or emails. The limited awareness of antivirus software, spyware, and malware among parents (four of the fifteen) is a concerning finding of this study.

5.2 Parental mediation strategies

As mentioned in the literature review, there are various parental mediation strategies—active, restrictive, co-viewing, and monitoring. The results indicated that the parents did not consciously practice any mediation strategy during pre-pandemic times as the children were in school from 9am to 4pm and their screen time was naturally restricted to about a couple of hours each day. The participants reported that they would at most ask their children not to use earphones while viewing online content.

Even during the CLP and post-CLP, nine of the 15 participants had children in the age group of 12-16 years. However, none of these participants were practicing any kind of mediation (active, restrictive, co-viewing, or supervision). When probed further for their reasons to not mediate, the participants said that there was no point as their children would not listen to them. Adding to the difficulty is their own low digital competence.

Nagy et al. (2023) introduced another category of mediation called permissive mediators, which is defined as the lack of involvement of the parents in their children's digital activities. In this regard, Pons-Salvador et al. (2022) associated low education with permissive mediation. Barron et al. (2009) and Hollingsworth et al. (2011) observed that parents with low digital competence tended to be more permissive and less participatory. The participants of this study expressed their inadequate knowledge of the various digital skills and, thereby, their inability to guide their children appropriately. Extending Barron et al.'s (2009) and Hollingsworth et al.'s (2011) argument to this study, it could be said that these participants practised the permissive mediation strategy.

The other six of the 15 participants of this study, whose children were in the age group of 6-11 years, however, went through some degree of digital competency development during the CLP and continued to apply their learnings post-CLP as well. The results showed that none of these parents practised active mediation or co-viewing. Their preference was more for restrictive and supervision strategies, some even combining the two. Under restrictive mediation, parents practised allowing children to use specific content (crafts and cartoon videos). Under supervision, parents kept time limits for the usage of digital devices. Pons-Salvador et al. (2022) observed that parents of children aged 6-9 years would allow children to go online with maximum supervision and are themselves digitally competent and are aware of activities children do online. However, the participants of this study exhibited a supervision mediation preference even

when they were not digitally competent enough in most cases, and exercised the mediation of children even beyond the age of 9 years. Some of the parents preferred combining the two strategies by keeping time restrictions and allowing children to use digital devices in their presence only as they were more concerned about the ill effects of excessive screen time on the physical and mental health of their children. It is to be noted that these parents did not use content filters or checked the browsing history of children given their lack of knowledge to ensure safe, responsible, and productive use of the digital opportunities.

6. Conclusion

The study highlighted the importance of parental digital competence in mediating digital technology use in children. The study found that in the rapidly advancing technological environment, parental participation in mediating the access and exposure to digital opportunities of children was restricted. While parents may be able to purchase digital devices for their children to use, they do not seem to be in a position to provide adequate and appropriate guidance to their children regarding safe, responsible and productive use of these opportunities. Children can be exposed to diverse risks on digital platforms such as cyberbullying, scams, and online frauds. As these threats pose significant risks to their devices and personal data, it is essential to provide children comprehensive education to enhance their device security skills and to recognise and avoid potential threats.

Due to their own limited digital competence, most parents from low-income families preferred to adopt permissive mediation, which leaves digital security and risk avoidance by children to chance. Research studies cited in the literature review have shown that active mediation is better when guiding children in appropriate use of digital opportunities. Thus, there is an urgent need to educate parents, particularly from low-income families, to learn digital skills and equip them with the capabilities and resources they need to raise their children in the digital era.

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