

## The Parental Support for Children's Homeschooling by Using Technology during COVID-19 Lockdowns: Evidence from South Asia and Africa

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**Abstract:** This study examines the impact of parental confidence in using technology on parental support for children's homeschooling during the first COVID-19 lockdown, focusing on six South Asian and African countries: India, Pakistan, Sri Lanka, Ethiopia, Ghana, and Tanzania. The researchers and educational officers collected data from 4,568 parents with children 6–16 years old from 23 countries. In South Asian and African countries, 54 households from India, 45 from Pakistan, 199 from Sri Lanka, 171 from Ethiopia, 142 from Ghana, and 58 from Tanzania and Zanzibar participated in this study. The results showed that the number of electrical devices per household correlated with households having a computer per child. Electronic devices were not widespread in the six South Asian and African countries as compared with the other countries. Countries where more households had internet access at home were more satisfied with internet speed. However, this tendency was not found in Pakistan and three African countries. The time that parents spent with a child at home was shorter in six South Asian and African countries than in the other countries. In almost all participating countries, parental confidence in using technology greatly impacted parental engagement in children's homeschooling, even when socioeconomic status was included in the analysis. These results contribute to the discussion on education and school closures during the COVID-19 pandemic.

**Keywords:** Technology use, parental support homeschooling, school closures, COVID-19, low-income countries

### Introduction

The COVID-19 pandemic caused many changes to society, and many temporary changes like lockdowns and school closures have lasting effects on education and learning. In the first pandemic period, from March to August 2020, the average duration of school closures across 210 countries was 11 weeks (UNESCO 2021). School closures temporarily moved the education of children to the home, where parents had to take responsibility for homeschooling. Technology became an essential tool for supporting learning during school closure under the COVID-19 lockdowns.

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Comparing high-income countries with low-income and middle-income countries reveals different situations in using technology at home. First, in high-income countries there is an environment that supports using technology at home including availability of electrical devices, connection to the internet, and speed of that connection—an environment not found to the same degree in low-income and middle-income countries. Second, parents have more opportunity to use online tools in high-income countries than in low-income and middle-income countries. Finally, schools adjust sooner to support homeschooling by using technology in high-income countries compared with low-income and middle-income countries.

Examining data from the international survey and focusing on Ethiopia, Ghana, and Tanzania and Zanzibar (from Africa) and India, Pakistan, and Sri Lanka (from South Asia), this study analyzed the use of technology, parental support in homeschooling, parental confidence in using technology, and the effect of parental confidence in using technology on parental support in homeschooling during school closures under the first COVID-19 lockdowns.

## **1. Parental Support in Children’s Homeschooling by Using Technology**

School closures caused a loss in children’s learning. For example, a study in the Netherlands reported that children 8–11 years old showed a learning loss of 0.08 standard deviations during the eight weeks of school closures (Engzell, Frey, and Verhagen 2021). In Belgium, a study found that the 2020 cohort in primary school showed a learning loss of 0.17 standard deviations for mathematics and 0.19 for Dutch during the nine weeks of school closures compared with the 2019 cohort (Maldonado and De Witte 2022). To minimize learning loss, some schools tried to conduct classes online during school closures, but regardless of the particular school situation, learning moved into the home. Children had no choice but to study at home during lockdowns and school closures, and this situation required parental support. Thus, parental support has been given increased attention. Parental engagement has been shown to have a largely positive impact on children’s homeschooling (Goodall and Vorhaus 2011), but the conditions of the pandemic challenged traditional modes of learning. Parental support is more effective when technical tools are available (Osorio-Saez et al. 2021).

The availability of electronic devices and internet access is of principal significance for homeschooling. Since COVID-19 is a droplet infection and requires isolation, the availability of online access is crucial for access to educational materials and online instruction. Reviewing the current studies concerning homeschooling during the COVID-19 pandemic, Ali (2020) reported that primary challenges included parents’ ability to provide laptops and spaces conducive to learning. The evidence from research in Finland (Häkkinen et al. 2020) found that the availability of information and communication technology (ICT) is key for remote schooling of children. However, whether children have sufficient access to electronic devices and an internet connection depends on their parents’ capacity to provide them, which is often dependent on their economic status. OECD (2020) reported that children from disadvantaged families often did not have access to an internet connection at home, which causes large learning gaps between children from affluent

and low-income families. Research in Nigeria (Briggs 2020) revealed that parents with higher socioeconomic status tended to have more electronic devices and internet access—and to prefer online classes more—than those with lower socioeconomic status.

The pandemic brought not only an increase in children's homeschooling but also the technology development to support it. The number of available online sources for education rapidly increased. Whether parents had the technological skills to support their children's homeschooling during lockdowns became a vital issue for children's learning. Parental confidence in using technology is also a large factor in parental engagement with homeschooling during pandemic school closures. Many schools have an online platform for sending messages or use online tools such as applications and social media to communicate with parents. The school and business closures of the pandemic brought a rapid development of technology and new uses for existing technologies, including ways for children to access online classes at home. In this situation, parental engagement became necessary to facilitate children's online learning (Garen, Evaristo, and Ang-See 2021), and parents' technology skills influenced children's capacity to access learning materials for homeschooling. Dimopoulos and colleagues (2021) mentioned that differences in parents' familiarity and comfort with ICT caused inequalities in learning during homeschooling. Parents with better technology skills enhanced the quality of homeschooling. Laxton, Cooper, and Younie (2021) found that access to online resources is valuable for improving home learning environments. Parental confidence in using technology directly impacts children's access to learning activities that enhance the quality of homeschooling.

## **2. Research Method**

### **2.1. Data**

The International COVID-19 Impact on Parental Engagement Study (ICIPES) 2020 was conducted to investigate parental engagement in children's homeschooling during school closures of the COVID-19 pandemic (Osorio-Saez et al., 2021b). The aim of the ICIPES 2020 was to examine how parents and caregivers developed skills to engage in children's homeschooling during the global COVID-19 pandemic. The ICIPES 2020 looked at four domains: (1) school support for parents and children, (2) parental engagement, (3) homeschooling and family life balance, and (4) parental confidence in using technology. It also collected parents' and children's demographic information.

The data collection was conducted online from May to July 2020 during the first lockdown of the COVID-19 pandemic around the world. The targeted population was the parents and caregivers of children 6–16 years old (level 1 in the International Standard Classification of Education [UNESCO 2011]). The University of Bath collected data from 23 countries in five regions including South Asia and Africa, and the representative for each country tried to collect at least 200 questionnaires. Snowball sampling was used, and the questionnaire was distributed to the targeted population through personal networks and social media. In total, 4,568

questionnaires were collected from parents (see Table 1). However, four countries were excluded—Belgium, Cameroon, Peru, and Spain—due to small sample sizes, and the remaining 4,600 samples from 19 countries were used. Focusing on Africa and South Asia, 669 samples from six countries participated in the survey: 54 from India, 45 from Pakistan, 199 from Sri Lanka, 171 from Ethiopia, 142 from Ghana, and 58 from Tanzania and Zanzibar.

**Table 1.** Questionnaire Distribution by Region and Country

| Region             | Country             | Number |
|--------------------|---------------------|--------|
| South Asia         | India               | 54     |
|                    | Pakistan            | 45     |
|                    | Sri Lanka           | 199    |
| Africa             | Ethiopia            | 171    |
|                    | Ghana               | 142    |
|                    | Tanzania & Zanzibar | 58     |
| Asia               | China               | 217    |
|                    | Japan               | 159    |
|                    | Turkey              | 78     |
| Latin America      | Chile               | 1,597  |
|                    | Colombia            | 94     |
|                    | Costa Rica          | 155    |
|                    | El Salvador         | 83     |
|                    | Honduras            | 246    |
|                    | Mexico              | 244    |
| North America      | Uruguay             | 61     |
|                    | United States       | 289    |
| Europe             | Italy               | 517    |
|                    | United Kingdom      | 191    |
| Excluding analysis | Belgium             | 5      |
|                    | Cameroon            | 10     |
|                    | Peru                | 15     |
|                    | Spain               | 28     |
| Total              |                     | 4,658  |

Source: Developed by author

## 2.2. Analysis

Before conducting analysis, variables were constructed for parental activities supporting children and parental confidence in using technology (Osorio-Saez et al., 2020, 2021a, 2021b). Appendix A1 shows the components of these variables. Two different five-point Likert scales were used for all variables: 1–5 indicating never, rarely, occasionally, often, or always; and 1–5 indicating not at all, slightly, moderately, quite, or extremely confident.

Three types of analysis were conducted: simple tabulation, correlation analysis, and multiple linear regression. Appendix A2 shows the variables used in the analysis. First, the availability of electronic devices at home was examined, and a simple tabulation was conducted for two variables: the number of electronic devices and the number of computers per child at home. Second, the condition of the internet connection at home was investigated, and a simple tabulation was conducted for two variables: an internet connection at home and satisfaction with the internet speed. Third, parental engagement in children's home-schooling during school closures of COVID-19 was examined, and a simple tabulation was conducted for two variables: a parent teaching a child at home and a parent spending time to teach a child at home. Fourth, a determination was made about the relationship between parental engagement in children's homeschooling and parental confidence in using technology, and a correlation analysis was conducted using two variables: parental activities supporting children and parental confidence in using technology. Finally, an estimation was made about whether parental confidence in using technology influenced parental engagement in children's homeschooling, and a multiple linear regression was conducted. The descriptive statistics of the variables used in the multiple linear regression are shown in Table 2. The dependent variable was parental activities supporting children, and the independent variables were parental confidence in using technology; parent gender, age, and socioeconomic status; number of siblings; child age; and relatives staying with child. The formula is as follows:

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} \dots + \beta_n x_{ip} + \varepsilon_i \quad (1)$$

where

$i = 1, 2, \dots, n$

$y_i$  = dependent variable

$\beta_0$  = intercept

$x_i$  = independent variable

$\beta_i$  = coefficient

$\varepsilon_i$  = error

**Table 2.** Descriptive Statistics

| Variable                                     | India  |       | Pakistan |       | Sri Lanka |       |
|--|--------|-------|----------|-------|-----------|-------|
|  | Mean   | SD    | Mean     | SD    | Mean      | SD    |
| Parental activities on supporting children   | -0.420 | 0.808 | -0.148   | 0.664 | -0.102    | 0.886 |
| Parental confidence in the use of technology | -0.369 | 0.452 | 0.004    | 0.393 | -0.046    | 0.527 |
| Parent's gender (Female dummy)               | 0.556  | 0.502 | 0.756    | 0.435 | 0.683     | 0.466 |
| Parent's age                                 | 3.852  | 0.684 | 3.311    | 0.821 | 4.151     | 1.188 |
| Socioeconomic status (SES)                   | -0.583 | 1.225 | -1.900   | 1.337 | -0.784    | 1.373 |
| Number of siblings                           | 2.093  | 2.357 | 5.133    | 1.714 | 2.709     | 2.249 |
| Child's age                                  | 9.667  | 3.168 | 9.422    | 3.237 | 12.291    | 3.376 |
| Staying with child                           | 0.926  | 0.264 | 0.711    | 0.458 | 0.884     | 0.321 |

| Variable                                     | Ethiopia |       | Ghana  |       | Tanzania & Zanzibar |       |
|--|----------|-------|--------|-------|---------------------|-------|
|  | Mean     | SD    | Mean   | SD    | Mean                | SD    |
| Parental activities on supporting children   | -0.443   | 0.723 | -0.085 | 0.715 | -0.204              | 1.050 |
| Parental confidence in the use of technology | -0.454   | 0.405 | -0.333 | 0.451 | -0.141              | 0.678 |
| Parent's gender (Female dummy)               | 0.199    | 0.400 | 0.430  | 0.497 | 0.483               | 0.504 |
| Parent's age                                 | 3.865    | 0.797 | 4.000  | 0.875 | 3.897               | 0.912 |
| Socioeconomic status (SES)                   | -0.352   | 1.062 | -1.033 | 0.852 | -0.753              | 0.807 |
| Number of siblings                           | 2.667    | 2.364 | 3.007  | 2.068 | 2.914               | 2.219 |
| Child's age                                  | 9.409    | 3.626 | 9.630  | 3.041 | 10.055              | 2.758 |
| Staying with child                           | 0.830    | 0.376 | 0.676  | 0.470 | 0.690               | 0.467 |

Source: Own calculations

## 4. Findings

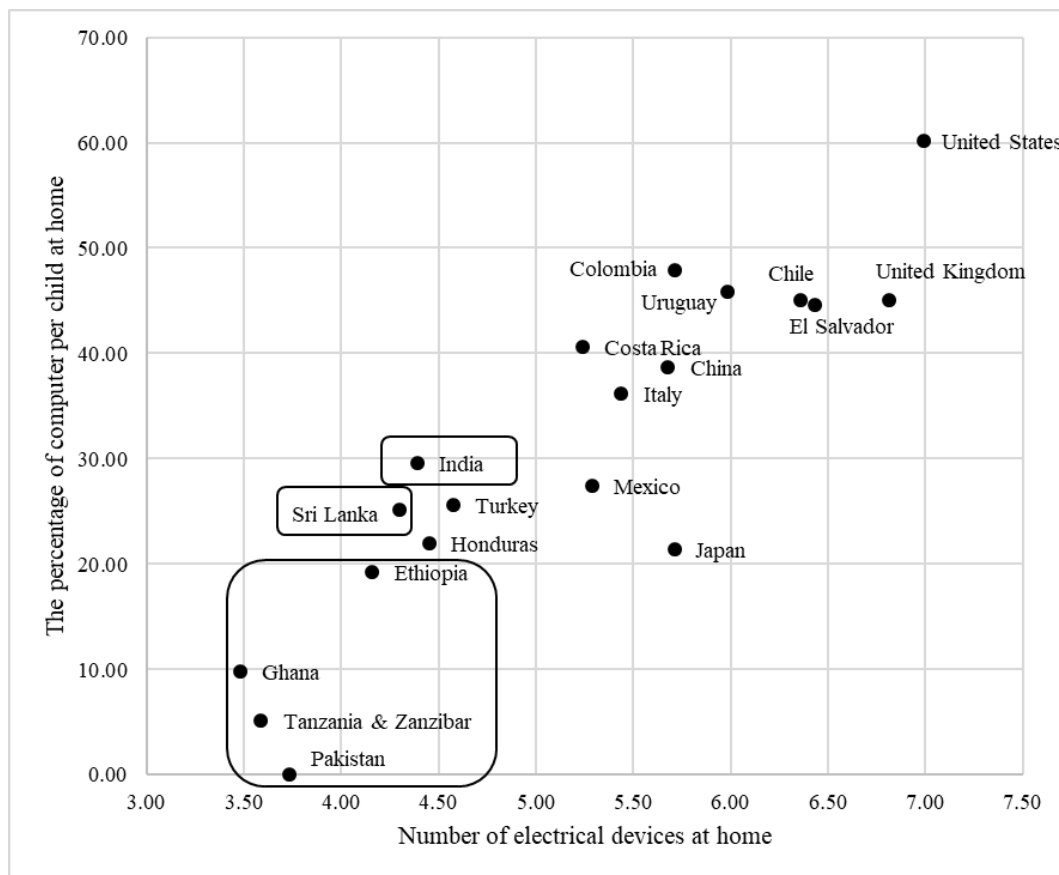
### 4.1. Environment of Using Technology

#### 4.1.1. Availability of Electronic Devices

Figure 1 shows the number of electronic devices (e.g., smartphones, tablets, iPads, laptops, and desktops) at home and the percentage of households with a computer per child. In all countries, there was an average of three or more devices in each home. However, the number was less in African and South Asian countries. It was less than five in India, Sri Lanka, and Ethiopia and less than four in Pakistan, Tanzania, Zanzibar, and Ghana.

Interestingly, the percentage of households with a computer per child correlated to the number of electrical devices at home. It was 20 to 30 percent in India, Sri Lanka, and Ethiopia. It was less than 10 percent in Ghana, Tanzania and Zanzibar, and Pakistan.

The relationship between the number of electronic devices at home and the percentage of households with a computer per child indicates clearly that countries with more electronic devices at each home also tended to have more households with a computer per child. Electronic devices were widespread in the United States and the United Kingdom but not in South Asian and African countries, especially in Tanzania and Zanzibar and in Pakistan.



**Figure 1.** Countries with more electronic devices per household also had more households with a computer per child  
Source: Own calculations

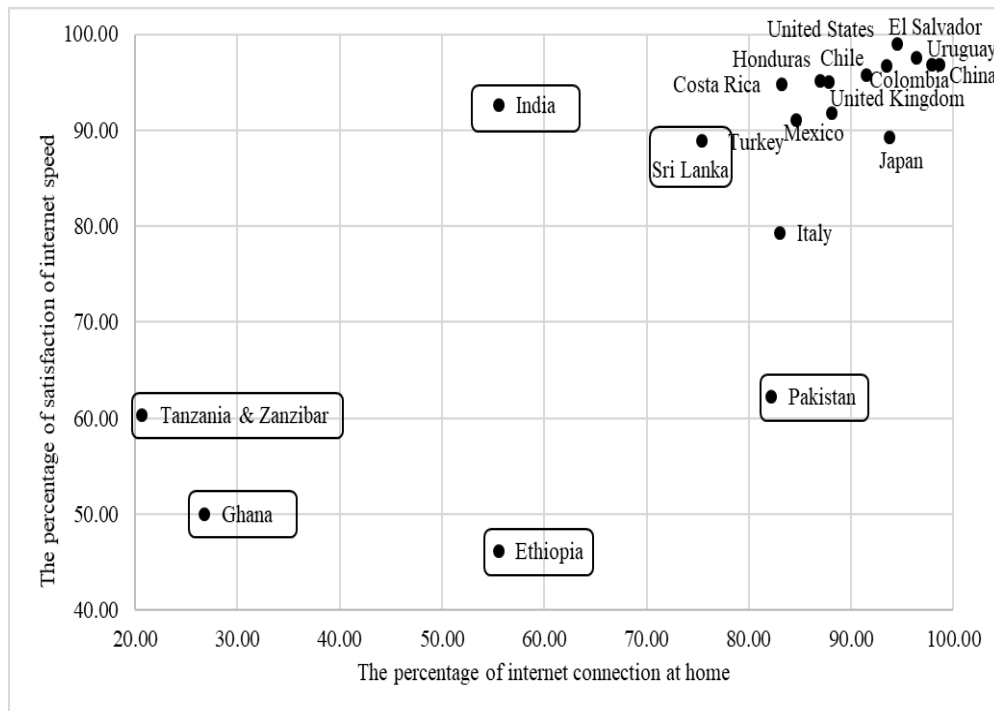
#### 4.1.2. Internet Access and Speed

Figure 2 shows the percentage of households with internet access at home and the percentage satisfied with their internet speed. The percentage of households with internet access at home was over 75 percent in 15 countries (China, the United Kingdom, El Salvador, the United States, Japan, Uruguay, Colombia, Mexico, Chile, Honduras, Turkey, Costa Rica, Italy, Pakistan, and Sri Lanka). In contrast, approximately half of households had internet access at home in India and Ethiopia, while in Ghana and Tanzania and Zanzibar, fewer than 30 percent of households did.

The majority (80 percent) of households in all countries were satisfied with internet speed, except for Pakistan, Tanzania and Zanzibar, Ghana, and Ethiopia, which also had lower percentages of households with internet access at home. In Ghana, Tanzania and Zanzibar, Ethiopia, India, and Sri Lanka, the percentage of households sharing internet from a mobile phone was higher: 13.3 percent in Pakistan and 74.14 percent in Tanzania and Zanzibar (see Figure 3). The countries

with higher percentages of households sharing internet from mobile phones tended to have lower speed satisfaction.

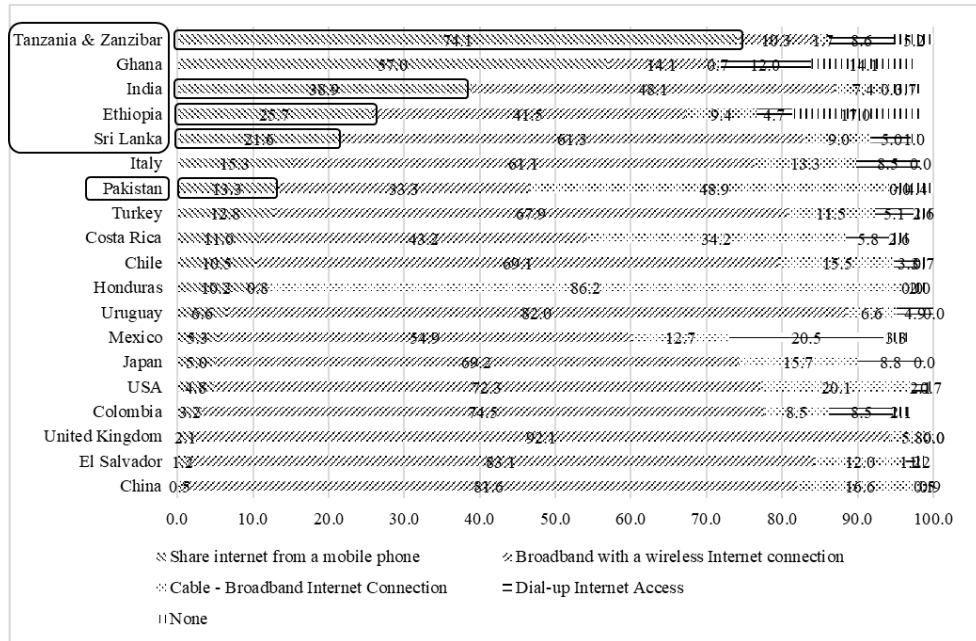
Countries with a higher percentage of households with internet access at home tended to also have higher satisfaction with internet speed, except for India and Pakistan. In Pakistan, a higher percentage of households had internet access at home but reported less satisfaction with speed; in India, the opposite was true: the percentage of household with internet access at home was lower, but satisfaction with speed was higher.



**Figure 2.** Countries where more households had internet access at home were more satisfied with internet speed

Source: Own calculations





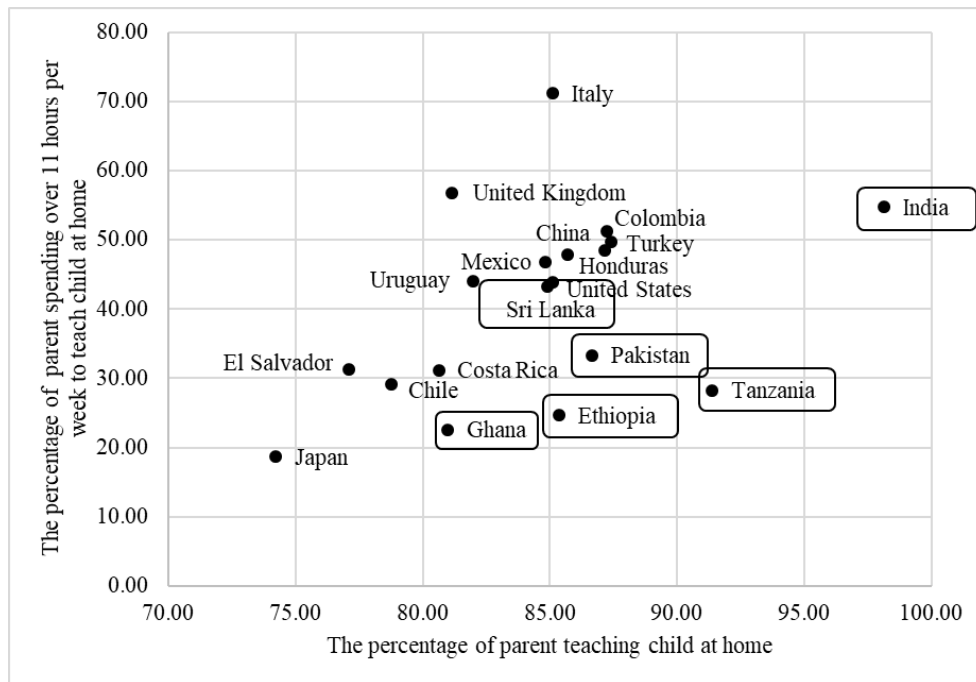
**Figure 3.** The percentage of types of internet connection at home  
 Source: Own calculations

#### 4.2. Parental Support

Figure 4 shows the percentage of parents teaching a child at home and the percentage of parents spending over 11 hours per week teaching a child at home. In all countries, over 70 percent of parents answered that they taught children at home. In India and Tanzania and Zanzibar, the percentages were high (over 90 percent). Comparing with Environment of Using Technology, parental support was robust in South Asian and African countries.

The percentage of parents spending over 11 hours per week teaching a child at home varied more widely. In India and Sri Lanka, it was over 40 percent, while in Pakistan, Tanzania, Ethiopia, and Ghana, it was 20 to 35 percent.

Countries with a higher percentage of parents teaching a child at home tended to also have parents who spent more time per week doing so, but there was not a clear relationship with availability of electronic devices and internet access and speed.

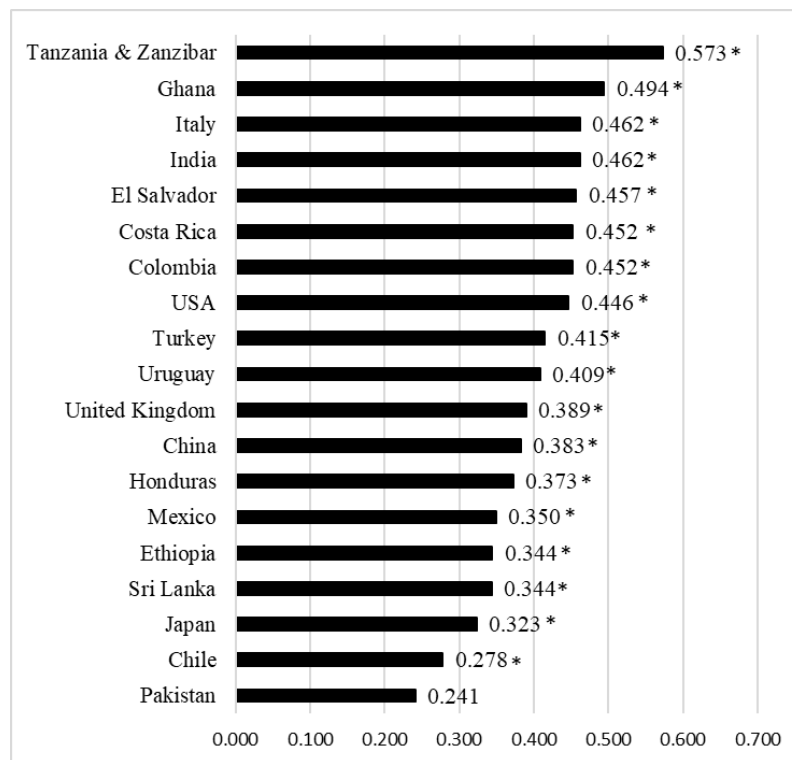


**Figure 4.** Countries where more parents were teaching a child at home spent more time doing so

Source: Own calculations

### 4.3. Relationship between Parental Engagement and Parental Confidence in Using Technology

Figure 5 shows the results of the correlation analysis for parental activities supporting children and parental confidence in using technology. There were significant correlation relationships in all countries except Pakistan. In Tanzania and Zanzibar, Ghana, and India, there were strong relationships, while in Ethiopia and Sri Lanka there were moderate relationships. Parents who engaged in more activities supporting children’s homeschooling tended to have more confidence in using technology, and parents with more confidence in using technology tended to engage in more activities supporting children’s homeschooling.



**Figure 5.** Relationship between parental engagement and parental confidence in using technology (Pearson correlation coefficient)

Note : \* $p < 0.05$ .

#### 4.4. Effects of Parental Confidence in Using Technology on Parental Support

Table 3 shows the effects of parental confidence in using technology on parental engagement in children's homeschooling. In Model 1, parental confidence in using technology was significant in all countries except for Pakistan. However, the effect sizes varied between 0.578 in Sri Lanka and 0.886 in Tanzania and Zanzibar. In Model 2—which considers parent and child demographic information such as gender, age, socioeconomic status, siblings, and living arrangements—parental confidence in using technology was still significant in all countries except for Pakistan and India. In India, the model 2 was not computed because the sample size was small. These results suggest that parental confidence in using technology did influence parental engagement in children's homeschooling during the pandemic school closures in four countries: Sri Lanka, Ethiopia, Ghana and Tanzania and Zanzibar.

**Table 3.** Effects of Parental Confidence in Using Technology on Parental Engagement

| Variable                                | India <sup>(1)</sup> |       |                        |    | Pakistan <sup>(1)</sup> |       |          |       |
|---|----------------------|-------|------------------------|----|-------------------------|-------|----------|-------|
|   | Model 1              |       | Model 2 <sup>(2)</sup> |    | Model 1                 |       | Model 2  |       |
|   | <i>B</i>             | SE    | <i>B</i>               | SE | <i>B</i>                | SE    | <i>B</i> | SE    |
| Parental activities supporting children | 0.825 ***            | 0.220 |                        |    | 0.407                   | 0.250 | 0.461    | 0.312 |
| Parental confidence in using technology |                      |       |                        |    |                         |       | -0.121   | 0.275 |
| Parent gender                           |                      |       |                        |    |                         |       | 0.063    | 0.176 |
| Parent age                              |                      |       |                        |    |                         |       | -0.024   | 0.095 |
| Socioeconomic status                    |                      |       |                        |    |                         |       | -0.002   | 0.069 |
| Number of siblings                      |                      |       |                        |    |                         |       | -0.009   | 0.046 |
| Child's age                             |                      |       |                        |    |                         |       | -0.242   | 0.270 |
| Relatives living with child             | -0.115               | 0.128 |                        |    | -0.150                  | 0.097 | -0.122   | 0.683 |
| R-squared                               | 0.213                |       |                        |    | 0.058                   |       | 0.103    |       |
| N                                       | 54                   |       |                        |    | 45                      |       | 36       |       |

| Variable                                | Sri Lanka |       |           |       | Ethiopia  |       |           |       |
|---|-----------|-------|-----------|-------|-----------|-------|-----------|-------|
|   | Model 1   |       | Model 2   |       | Model 1   |       | Model 2   |       |
|   | <i>B</i>  | SE    | <i>B</i>  | SE    | <i>B</i>  | SE    | <i>B</i>  | SE    |
| Parental activities supporting children | 0.578 *** | 0.112 | 0.582 *** | 0.128 | 0.615 *** | 0.129 | 0.633 *** | 0.132 |
| Parental confidence in using technology |           |       | 0.052     | 0.134 |           |       | 0.195     | 0.134 |
| Parent gender                           |           |       | 0.128 *   | 0.061 |           |       | -0.031    | 0.080 |
| Parent age                              |           |       | -0.020    | 0.050 |           |       | 0.040     | 0.055 |
| Socioeconomic status                    |           |       | -0.069 *  | 0.029 |           |       | -0.008    | 0.023 |
| Number of siblings                      |           |       | 0.028     | 0.020 |           |       | -0.017    | 0.017 |
| Child's age                             |           |       | -0.069    | 0.208 |           |       | -0.017    | 0.152 |
| Relatives living with child             | -0.075    | 0.059 | -0.757    | 0.369 | -0.164 *  | 0.078 | 0.124     | 0.316 |
| R-squared                               | 0.118     |       | 0.194     |       | 0.119     |       | 0.138     |       |
| N                                       | 199       |       | 162       |       | 171       |       | 169       |       |

| Variable                                | Ghana     |       |           |       | Tanzania & Zanzibar <sup>(1)</sup> |       |           |       |
|---|-----------|-------|-----------|-------|------------------------------------|-------|-----------|-------|
|   | Model 1   |       | Model 2   |       | Model 1                            |       | Model 2   |       |
|   | <i>B</i>  | SE    | <i>B</i>  | SE    | <i>B</i>                           | SE    | <i>B</i>  | SE    |
| Parental activities supporting children | 0.782 *** | 0.116 | 0.538 *** | 0.158 | 0.886 ***                          | 0.170 | 0.773 *** | 0.205 |
| Parental confidence in using technology |           |       | -0.102    | 0.147 |                                    |       | 0.149     | 0.289 |
| Parent gender (Female dummy)            |           |       | 0.130     | 0.089 |                                    |       | 0.106     | 0.167 |
| Parent age                              |           |       | 0.053     | 0.088 |                                    |       | -0.161    | 0.203 |
| Socioeconomic status                    |           |       | 0.056     | 0.036 |                                    |       | -0.008    | 0.063 |
| Number of siblings                      |           |       | -0.045    | 0.025 |                                    |       | 0.042     | 0.051 |
| Child's age                             |           |       | 0.137     | 0.157 |                                    |       | 0.299     | 0.308 |
| Living with own child                   | 0.175 **  | 0.065 | -0.185    | 0.448 | -0.079                             | 0.116 | -1.261    | 0.819 |
| R-squared                               | 0.244     |       | 0.282     |       | 0.328                              |       | 0.309     |       |
| N                                       | 142       |       | 77        |       | 58                                 |       | 49        |       |

Note. (1) The sample size was small. (2) In India, the model 2 was not computed because the sample size was too small.

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

Source: Own calculations

## 5. Discussion

### 5.1. Were the Availability of Electronic Devices and Internet Access Satisfactory?

Most of the countries did not report satisfactory conditions in terms of the number of electronic devices per household and the number of households with a computer per child. Satisfaction was significantly lower in Pakistan, Tanzania and Zanzibar, and Ghana. The availability of internet access at home and satisfaction with internet speed were satisfactory in most of the countries. However, there was a considerable problem in South Asian and African countries such as Pakistan, India, Sri Lanka,

Tanzania and Zanzibar, Ghana, and Ethiopia, where a lower percentage of households had internet access at home and the percentage sharing internet from a mobile phone was higher. In these conditions, it is almost impossible to study online, and children are more likely to suffer learning losses during school closures.

### **5.2. How Was Parental Engagement in Children's Homeschooling?**

Most parents in all countries supported children's homeschooling during school closures. However, the amount of time spent teaching children at home varied widely between countries. In India, parents spent a great deal of time. These results were consistent with data from UNESCO (2021). There was a strong relationship between the percentage of parents helping their children with education and the amount of time spent. In India, 95 percent of parents were teaching children at home, and the average time spent was 12 hours per week.

Parents were asked (in open-ended questions) the reasons why they did not spend time teaching children at home (if they did not). As shown in Figure 3, Ghana and Ethiopia had lower percentages of parents spending over 11 hours per week teaching a child at home; the answers of parents included a variety of reasons. In Ethiopia, some parents answered that they did not have time to teach and there were no materials at home. A few parents answered that children could study by themselves. In all countries, parents were lucky if their own work allowed them the time or ability to teach their children. In Ethiopia, parents valued children's independence. In Ghana and Ethiopia, there was a lack of teaching and learning materials at home. In these situations, parents did not spend time supporting children's homeschooling.

### **5.3. Was Parental Confidence in Using Technology Essential for Parental Engagement?**

In this study, a relationship was found between parental engagement in children's homeschooling and parental confidence in using technology. It was clear that parental confidence in using technology influenced parental engagement in children's homeschooling during school closures. These results show that supporting or enhancing parental use of technology was vital to increasing parental engagement in children's homeschooling during school closures. These findings correspond with previous studies (Lewin and Luckin 2010).

Do parents who have higher socioeconomic status tend to have higher confidence in using technology? To answer this question, an additional analysis was conducted to examine the Pearson correlation coefficient between socioeconomic status and parental confidence in using technology. Interestingly, its values were not high in all countries, meaning that parents who have higher socioeconomic status do not always have higher confidence in using technology. In addition, as shown in Table 3, even if socioeconomic status is controlled, parental confidence in using technology was significant in almost all countries.

## 6. Conclusion

The COVID-19 pandemic brought changes in education. School closures increased parental engagement in children's homeschooling, and technology use became a particularly significant factor in the quality of children's homeschooling. With data from parents in 19 countries about homeschooling during the first school closures of the COVID-19 pandemic, this study examined the environment of using technology, parental support in homeschooling, parental confidence in using technology, and the effect of parental confidence in using technology on parental support in homeschooling during school closures under the first COVID-19 lockdowns.

The results can be summarized as follows. The number of electronic devices at home was lower in Ghana, Tanzania and Zanzibar, and Pakistan, as was the percentage of households with a computer per child. In South Asian and African countries, internet access and speed were not satisfactory. In India and Tanzania and Zanzibar, most parents taught a child at home during school closures. There were significant relationships between parental engagement in children's homeschooling and parental confidence in using technology in all countries except Pakistan. Parental confidence in using technology was significant in all countries except Pakistan, even when parent and child demographic information such as gender, age, socioeconomic status, siblings, and living arrangements were considered.

This study had a few limitations. First, data were obtained from people with internet access because data collection took place during the COVID-19 pandemic. Second, data were collected using snowball sampling instead of random sampling. Third, the countries studied might not represent all countries. Finally, the questionnaire did not always consider countries' specific contexts. For example, some questions about checking school online platforms and presenting digital content might have been difficult to answer in low-income and middle-income countries, as most schools in these countries do not have school online platforms or portals due to limited internet access.

Although there were limitations, this study focused on six South Asian and African countries and presented the results, showing the environment of using technology, parental support in homeschooling, parental confidence in using technology, and the effect of parental confidence in using technology on parental support in homeschooling. These results contribute to the discussion on education and school closures during the COVID-19 pandemic.

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## Appendix

## Appendix A1. Parental Activities Supporting Children and Parental Confidence in Using Technology

| Variable                                      | Question   |
|---|--|
| Parental activities supporting children       | I follow my own ideas about what my children need to learn.  |
|   | I mix my own ideas with the school's plan for what my children need to learn.  |
|   | I list and prepare the activities myself before developing them with my child(ren).  |
|   | My children and I have a set homeschooling timetable.  |
|   | I develop, with my children, spontaneous learning activities not necessarily school-related such as cooking, woodwork, online games, physical activities, etc. |
| Parent using technology as tool or resource   | I check the school's emails, blog, and website to follow the activities they suggest for the children.   |
|   | I check the school's online platforms or portals to find out information about my child's homework and performance.  |
|   | I help my child present more attractive digital content.   |
| Parent using technology for social networks   | I follow on social media what other parents do and try to do exactly the same.   |
|   | I follow on social media what other parents do and use it as inspiration.  |
|   | I take ideas from relatives or friends using other means of communication (e.g., phone, WhatsApp, etc.)  |
|   | I share relevant information about my child with the school using email, apps, or social media.  |
|   | I look for ideas on the internet using different websites.   |
| Parental confidence in using technology       | I play online games with my child.   |
|   | I do troubleshooting on my child's computer.   |
|   | I help my child with online homework.  |
|   | I use parental controls on the computer, tablet, or TV.  |
| Parent using technology for building capacity | I identify useful websites to support my child's learning.   |
|   | I identify useful websites to support my role as a parent.   |
|   | I learn new things online to support my child's curiosity.   |
|   | I download apps and other digital materials to support my child's learning.  |
|   | I check websites and apps to advance my knowledge to support my child's learning.  |

Source: Developed by author

## Appendix A2. Variables Used in the Analysis

| Variable  | Scale  |
|---|--|
| Number of electronic devices at home              | Total number of smartphones, tablets, iPads, laptops, and desktops   |
| Computer per child at home                        | 0 = No; 1 = Yes  |
| Available internet connection at home             | 0 = No; 1 = Yes  |
| Satisfaction with internet speed                  | 0 = Not satisfied; 1 = Satisfied   |
| Parent teaching child at home                     | 0 = No; 1 = Yes  |
| Parent time spent teaching child at home per week | 1 = Less than 10 hours; 2 = 11–20 hours; 3 = 21–30 hours; 4 = More than 31 hours   |
| Parental activities supporting children           | Regressed scores of five variables regarding parental engagement   |
| Parental confidence in using technology           | Average of regressed scores of three variables: parent using technology as a tool or resource, parent using technology for social networks, and parent using technology for building capacity                  |
| Parent gender (Female dummy)                      | 0 = Male; 1 = Female   |
| Parent age  | 1 = Under 18; 2 = 18–24; 3 = 25–34; 4 = 35–44; 5 = 45–54; 6 = 55–64; 7 = 65–74 years old; 8 = 75 or older  |
| Socioeconomic status                              | Regressed scores of five variables: parent's years of schooling, parent's occupation, monthly household income, usable devices (smartphones, tablets or iPads, laptops, and desktops), and computers per child |
| Number of siblings                                |  |
| Child's age                                       |  |
| Living with own child                             | 0 = Others; 1 = Father and mother of the child   |