

# DOUBLE JEOPARDY IN LEARNING IN PAKISTAN: COVID-19 AND THE DEEP DIGITAL DIVIDES

[WORKING PAPER]



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## **ABSTRACT**

The COVID-19 pandemic has set new challenges as well as new directions in many of the social, political, and economic spheres across the world. Education service delivery emerged as one of the hardest hit and most staggering of the challenges for both developed and developing countries of the world, much more so in the case of latter. Amid the frenzy to overcome, at least to some extent, learning losses, technology became the main instrument with which to ensure some level of education delivery in many countries in the world. In Pakistan, too, technology solutions were proposed and implemented by government and private entities alike. However, the true potential of technology to reach the un-reached needed necessary contextualization. The sheer scale of the un-reached could be seen in that about 28 million learners are without access to televisions, Internet and Smartphones in the country. In this light, and with digital divides well-established in the global scholarship and associated SES effects in education, this working paper explores technology's potential and positioning in efforts to curb learning losses in Pakistan during the COVID-19 pandemic. By adopting a quantitative descriptive approach and using some of the most recent datasets in Pakistan, we posit in this paper that while technology's potential may be promising in addressing learning losses, the digital divides run mind-bogglingly deep, thereby raising important questions on where first pay attention to when aiming to plug the gaps in learning.

With the registry of first cases in late 2019, the world found itself gripped by the COVID-19 pandemic in matters of weeks. As countries scrambled their resources to tackle the situation, it was hardly a feat of imagination to see how it was going to affect education

globally, much more so in countries where education service was already in trouble with deep rooted inequities and inefficiencies. Education in Pakistan, too, went into a tailspin as schools were closed in a hurry in March 2020, leaving decision makers, practitioners, parents, schools and students in a complete disarray. The school closures put hundreds of thousands of students at risk of dropping out. Various governments and private enterprises resorted to digital learning programs such as TeleSchool and TeleTaleem to ensure some level of learning continued at homes. Various private educational organizations used digital platforms such as Zoom and Google Classrooms to deliver instruction and content to their students. What ensued in the aftermath was chaos at best as teachers, with no training and preparation whatsoever, struggled to meet the challenges of online teaching. Parents were equally caught off-guard, especially those at the lower rungs of socioeconomic ladder, when schools expected of them to take an active role in helping their children learn from home. In this backdrop, this working paper explores the possibilities and limits in the use of technology as a driver for addressing educational needs in the country in pandemic times.

We specifically explore, ‘what possibilities existed for tech-based solutions to promote learning in pandemic times in Pakistan.’ It adopts a quantitative descriptive approach by tapping into the most current data from the Pakistan Social and Living Standards Measurement (PSLM) survey 2018-19 and the population census 2017. We also use ASER survey data in combination to present an overview of how the pandemic could have deepened the learning crises that was already in a dismal state of affairs. The working paper will first give a brief discussion of the hypotheses and methodology. This will be followed by results, discussions and conclusions.

## **BACKGROUND AND HYPOTHESES**

According to the World Bank (2021), at one time during the pandemic, 1.6 billion students were out of school due to school closures, a figure that stood a whopping 258 million before the pandemic. Many of these students came from the developing world. Pakistan, with its over 22 million children already out of school has been a significant contributor in the number. We see that while governments and private educational service organizations initiated their tech based solutions to provide some level of learning during the pandemic, such efforts seem paled by the deep digital divides that this study highlights in one of the most differentiated education ecosystem in the world. In the framework of equity in educational provisions, we specifically explored three hypotheses. First, we hypothesize that the digital penetration in Pakistan is uneven across provinces. Second, we hypothesize a huge SES effect in digital penetration. Third, we assume that the first two divides compound the effects in a third-level divide i.e., the failure of tech-based solutions to provide learning experiences to those who needed support the most.

## **METHODS**

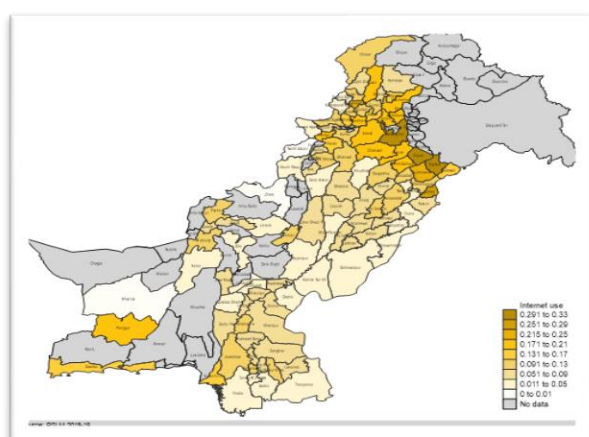
We employed three data sets in the statistics presented in this paper. First, we use most current data from the Pakistan Social and Living Standards Measurement (PSLM) 2018-19 to pull out information on internet access, smartphone use and television use across

districts and socioeconomic status in Pakistan. Second, we use population census 2017 to estimate on the demand for education (proportion of school going children) across districts in Pakistan. Third, ASER 2019 and PSLM 2018-19 data is used to present learning levels across SES lines and internet access at district level. Given the primacy of the concern, we provide descriptive explanations of the digital divide that majority of the learners in Pakistan experience. We do this by doing correlations wherever they make sense and present our preliminary findings in graphical representations.

## FINDINGS & DISCUSSION

In this section, we give key findings based on the descriptive analyses of the data from PSLM 2018-19 and population census 2017. First we give a macro-level profile of the digital penetration in Pakistan. Second, we give how the first digital divide (Attewell, 2001; van Deursen & van Dijk, 2018; Zhao & Elesh, 2007) reflects across the socio-economic strata. Third, we present the more granular information on how the digital divide reflects in terms of the use of digital media, primarily TV and Internet, to promote learning amid the pandemic in Pakistan.

### Digital Penetration: Stark Macro-Level Divides



**Figure 1: Internet Use—Country Profile  
(Proportionate to Population)**

We find that the macro-level picture of digital penetration in Pakistan is highly uneven, at least in the data that we explored. This is reflected in the disproportionately high use of the Internet in North-Eastern regions of Pakistan including Islamabad Capital Territory (ICT) and central and upper Punjab including its provincial capital, Lahore. Figure 1 shows that if technology was the primary vehicle during the pandemic, there was much less reach out, especially in the large rural swathes of the country. Some of the regions,

such as large parts of Azad Jammu and Kashmir, Baluchistan, Gilgit-Baltistan do not even register under the data radar, leaving one clueless about if and how internet became a vehicle for learning in these regions. A more significant trend in the unevenness of the digital penetration is seen in the increasingly lesser penetration in the younger population who should be using technology to ensure their learning during the pandemic.

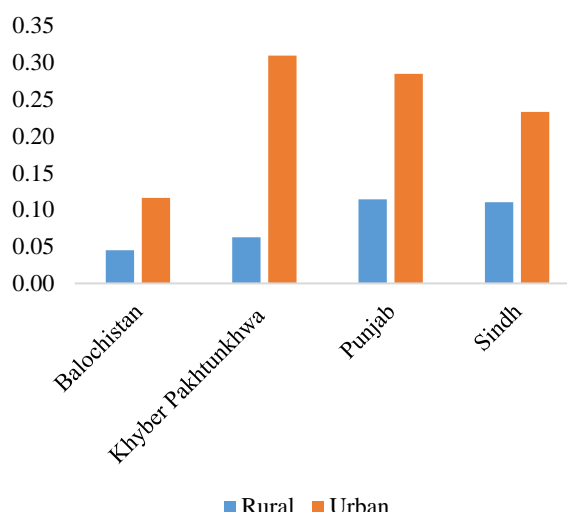
Figure 2 shows that as the ratio of individuals aged 4 to 17 increases in population, their internet use decreases. What this means in practice is that most of the potential learners from early childhood to higher secondary schooling in the country are increasingly using less internet. Given the youth bulge in the country with over 60% young people having lesser internet connectivity, any tech based solutions could have never reached those who needed it the most. While this suggests a high need to provide internet services to the younger population in the country, it suggests that any tech-based solutions, especially using the Internet may not be feasible to reach out to the millions. This suggests that there is a very high need (call it demand for education) to target this age-bracket in providing access to the internet resources as these are the individuals who should be in educational institutions, learning. But, in times of COVID-19, this is the segment that seems left-out the most.

**Figure 2: Internet use by individuals aged 4 to 17 proportional to population**

in provinces that fall on the lower spectrum of internet penetration in Pakistan (Table 1).

*Table 1: Ratio of school age (4 to 17) children in Pakistan*

When we compared these figures with the ratio of school-aged children, we found the digital divide becoming exponential given that there is larger share in the school age children



**Figure 3: Internet use (Provincial Profile)**



Province	Rural	Urban	Total (Province)
Baluchistan	0.409	0.394	<b>0.404</b>

Khyber Pakhtunkhwa	0.401	0.353	<b>0.385</b>
Punjab	0.352	0.315	<b>0.339</b>
Sindh	0.381	0.324	<b>0.356</b>
<b>Total (Pakistan)</b>	<b>0.374</b>	<b>0.331</b>	<b>0.358</b>

## Digital Penetration: Provincial and Geographic Divide

In line with our second hypothesis, we find that the first digital divide is apparent across the provinces in Pakistan (Figures 3 & 4). With Baluchistan at the tail end, Punjab leads in terms of the Internet use with Sindh and KP trailing behind. The geographic divide is also very apparent in the fact that less than 10% of the population in the country in rural areas uses internet. Cumulatively, this reflects in only 15% use of internet in the population in rural areas compared to 20% in the urban areas. This difference may appear nominal but this essentially means that with rural areas already lagging behind in educational access, pandemic multiplied the disadvantage for rural population. If we juxtapose this with the fact that individuals in the age bracket of 4 to 17 decreasingly use internet, the pandemic seems to have left deeper and longer impacts on the learning curves for millions of students in the country.

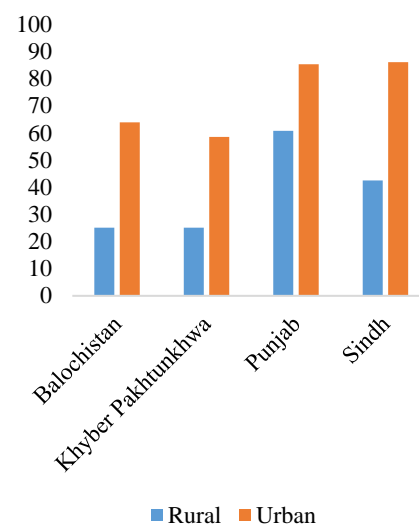


Figure 4: Population with television/LED in Pakistan

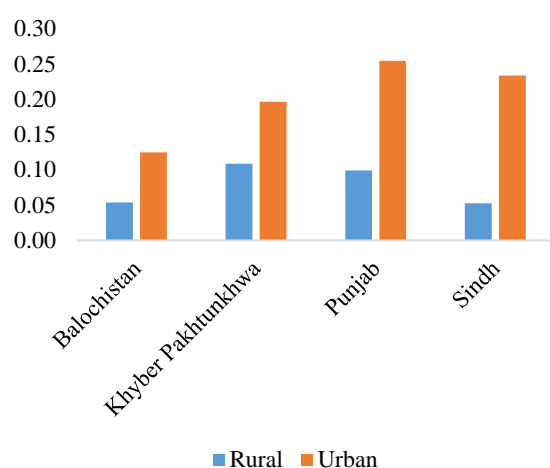


Figure 5: Smartphone use in Pakistan

further trouble. To put it in perspective, 26 million children without internet and about 28 million without access to televisions, Internet and Smartphone (Table 2), learning losses during the pandemic appear phenomenal.<sup>1</sup>

Table 2: Proportions of School-Age Children with no internet and television

<sup>1</sup> The estimates presented are based on PSLM 2018-19 and Population Census 2017

Province	No Internet	No Internet, TV and Smartphone
Khyber Pakhtunkhwa	0.386	0.397
Punjab	0.342	0.355
Sindh	0.360	0.376
Baluchistan	0.404	0.408
<b>Pakistan (average)</b>	<b>0.361</b>	<b>0.379</b>

Source: PSLM 2018-19

## Digital Penetration: SES Profile

Confirming the decades of research on the digital divide across income levels and hence confirming our third hypothesis, we find numbers reflecting a highly differentiated terrain of internet use, SES-wise, in Pakistan.

As figure 5 shows, as the log of district median income decreases, internet use decreases. As can be seen, for every decrease of 0.5 in log of income, internet use decreases by as much as 15%. This is further reflected in the granular information (Figures 6-9) that shows that parents who spend more on the education of their children are also the ones who spend more on the TV, smartphone and internet usage suggesting the strong inverse relationship between income and provision of digital resources for learning at home.

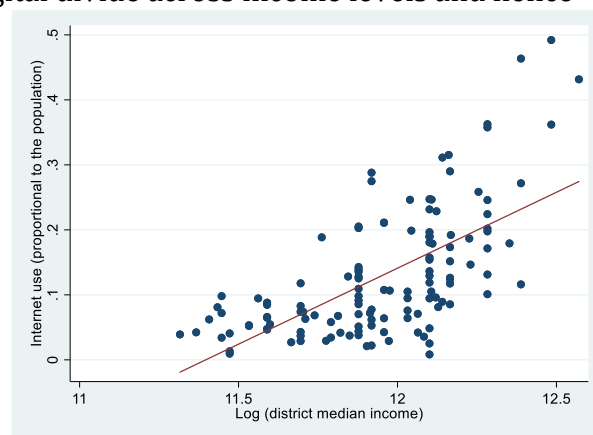


Figure 6: Internet use (income profile)

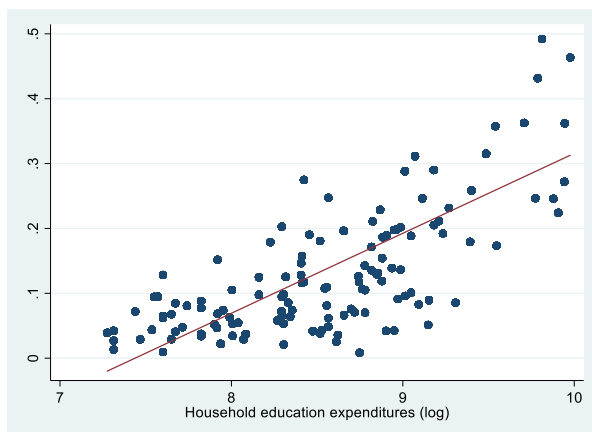
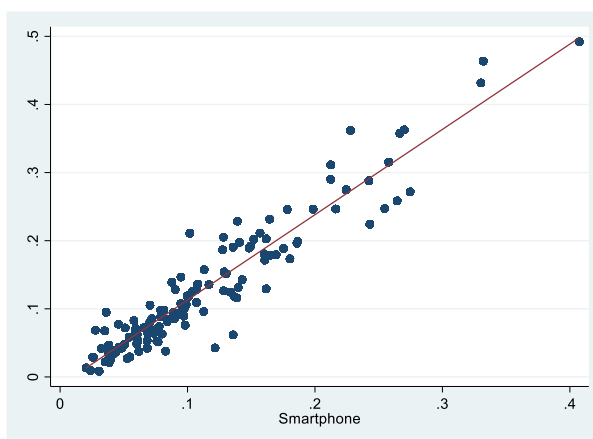


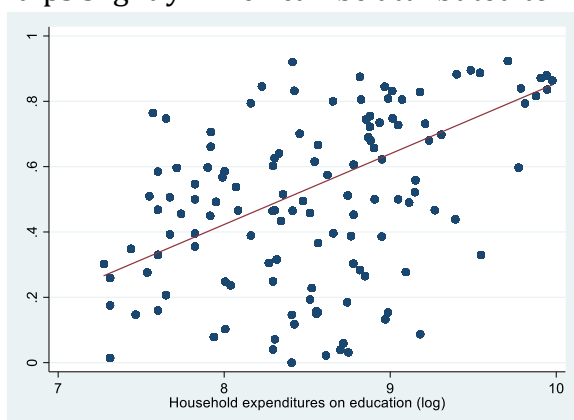
Figure 7: Relationship between education expenditures and internet use across districts in Pakistan

These significant correlations suggest an underlying income related dimension of the use of smartphones by individuals in higher income brackets compared to their counterparts in lower income brackets. While smartphones have increasingly become available for population, thanks to cheaper products from China, we may see a disproportionate use of the internet because the cost of internet itself may be out of reach for many.

Furthermore, if we use household expenditure on education categorized in income quartiles as a proxy for learners' distribution in low, middle, high cost and public schools, we find significantly less use of technology in households where children attend a low-fee private or public school. As Table 3 shows, learners in the bottom quartile experience much less use (0.117) compared to their counterparts in the third quartile (0.195). From the third to uppermost quartile, technology use dips slightly which can be attributed to



**Figure 8: Correlation between smartphone and internet across districts in Pakistan**



**Figure 9: Relationship between television use and education expenditures and internet use across districts in Pakistan**

factors which may be more cultural than economic. The double jeopardy that we can see here is in number (read as ratio in Table 3) that increases as we go down the income quartiles suggesting even lesser technology available in lower income households. Looking at these problematic correlations, we can imagine the learning losses that will have occurred in public schools, in low-fee private schools and schools in rural areas.

**Table 3: Technology use by household expenditures on education**

Education Expenditures	Average internet use	Average smartphone use	Average television use	Ratio of school age children
Bottom 25%	0.117	0.101	0.531	0.370
Median (50%)	0.149	0.130	0.551	0.362
75%	0.195	0.165	0.652	0.347
Top 25%	0.159	0.137	0.580	0.358
<b>Total</b>	<b>0.158</b>	<b>0.136</b>	<b>0.580</b>	<b>0.358</b>

Source: PSLM 2018-19

## Learning Losses

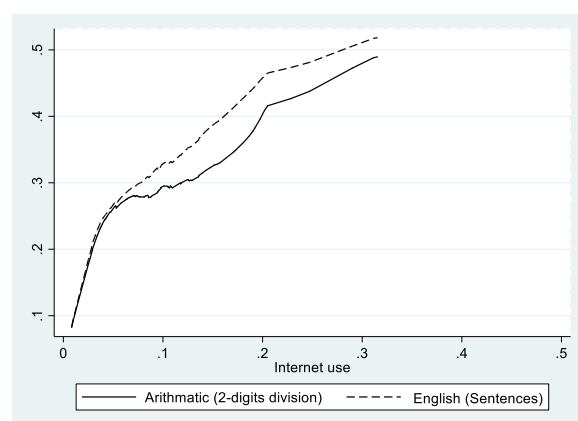
Figures 10 and 11 corroborate the earlier findings in this study on the double jeopardy that learners in lower income quartiles face. For example, in Figure 10, the learners coming from fourth income quartiles are performing better (close to 0.4 in English and close to 0.35 in Arithmetic) compared to their counterparts in the bottom quartile (around 0.2 in both English and Arithmetic). Juxtaposing this with the findings from Figure 11, the double jeopardy narrative gets strengthened that a learner in the lower

income quartiles compared to upper quartiles suffers much more learning losses during a pandemic owing to disproportionately lesser access to and usage of technology, especially if the medium has primarily been smartphones and internet. Figure 11 essentially confirms the deepest of the digital divides by showing the closer association between internet usage and achievement in English and Arithmetic, with a higher gradient for English. This, in conjunction with the finding from Figures 6 through 9 and Table 3. That is, based on the inequitable use of the digital technology, including television, along socioeconomic and geographic lines, we can imagine the learning losses to be staggering in learners in lower income quartiles. While we leave this for a future analysis on the effect sizes and amounts of loss in learning, this descriptive quantitative analysis exposes deep learning fissures along socioeconomic lines.

## Conclusions

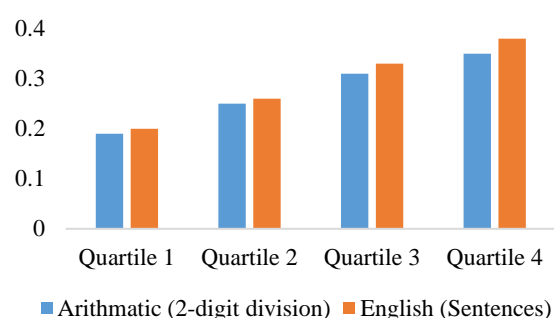
This study suggests that any internet, smartphone, computer and laptop based approach to learning in pandemic, and even in normal, times will certainly fail in the presence of the inequities in the form of both the first and the second level digital divides (Zhao & Elesh, 2016). This is because the second level digital divide, which is serious of the two divides, will hamper quality learning experiences if the underlying inequities of the offline world easily transport themselves to the digital world.

This is also true because overcoming the first digital divide may still be possible, which seems less likely at least in the medium term future, addressing the challenges of second digital divide (Attewell, 2001; Zhao & Elesh, 2007) would be much more serious if not entirely impossible. The strand of the sociological research founded on conceptions of sociocultural capital (e.g., Bourdieu, 1986) suggest that just giving access to technology is not a sufficient, though a necessary condition, to ensure an impactful learning



**Figure 11: Learning associations with internet use**

Source: ASER 2019, PSLM 2018-19.



**Figure 10: Learning levels of students who can do 2-digits division and read English sentences by wealth status.**

experience for learners both pandemic and non-pandemic times. This is because even if learners have access to technology, the often low “social capital” among children from low SES brackets fail to optimally benefit because of the many nuances in the process such as the relevance of curricular and pedagogical devices and approaches which are often at odds with the lived realities of these learners. Thus, since the social capital is already low or is at variance with inherent curricular and pedagogical experiences, their ability to benefit from tech-based instruction appears seriously compromised. While the promises

of technology may be many, those promises will fall short of materializing if the underlying digital divides persist thereby doubly jeopardizing the learners in lower income brackets.

Does this mean Television should be the right platform given at least the relatively low effect in terms of first-level digital divide? The answer we find is partly yes. The data suggest that the use of TV in households in lower income brackets is higher compared to the counter parts in the middle and upper brackets. However, we also assume that the efficacy of TV based interventions will be limited given that low income households typically have only one TV to which all eyes may be glued to leaving little time for children in school age to benefit from tele content and instruction. For now, if at all, a low-tech approach seems to be the better path forward for learners in low fee private and public schools. For learners in middle to high-cost schools, Internet and smartphone solutions may work but with the caveat that teacher, learner and parent capacity will be the primary factors determining the success of such approaches.

In conclusion, if providing appropriate, high-quality learning experiences for ALL learners matters, which we believe it should, COVID-19 pandemic should be the biggest of the alarm bells for countries like Pakistan. COVID-19 was not the first and certainly will not be the last of the pandemics. For countries like Pakistan, allaying negative effects of such pandemics would require way more than one-off, fragmented approaches to tackle educational crises. Decades of research on education change has yielded important insights on how schools in difficult conditions can be lifted up on scale (Fullan, Rincon-Gallardo, & Hargreaves, 2015). Technology can be appropriately leveraged in pandemic and non-pandemic times. This would require first ensuring equitable access to quality education in the offline world so that deep-seated inequities do not transport themselves to the online worlds of learning, which is what seems to be the case given the findings of this study. Therefore, we propose that when technology becomes a driver for mitigating learning losses, the transition from the offline to the online world is carefully mediated through judicious and careful assessment of where to engage resources in the first place. Therefore, if anything can be inferred from this study, as pointed out by decades of research from around the world, any tech-based solution, with no appropriate measures to make it work for those who need it the most, appears to act as double jeopardy. A systemic approach where technology comes later as part of a more comprehensive design with a preferential focus on building capacity in-context will ensure lasting and continuous learning and improvement in schools.

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