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TITLE OF THE PROJECT: IMPACT OF DIGITAL DIVIDE ON INDIAN
EDUCATION SYSTEM

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1. PROJECT DESCRIPTION

Motivation:

Since the pandemic started there has been a paradigm shift in education in the entire
world. The entire world was now shifting towards online education from traditional
classroom education. It was true for India too but was India ready for this shift?
Although the shift was indeed the only resort to keep the education going, was the
shift fair towards various kinds of students across India? During the Covid19
pandemic we came across various news, and articles about the Digital divide in India
and how it is affecting education in India.
**One particular news that deeply touched us and motivated us to take up the
study of the Digital divide in Education in India was the news of a girl in
Maharashtra Satara killing herself due to the unavailability of a mobile phone
for online classes, As the family could not afford it. Article Link**

This along with various other similar heartbreaking news made us realise that not
everyone in India is privileged enough to have a steady internet connection or have
access to smartphones and laptops. As a result, many students are unable to attend
classes due to the availability of these resources and losing out on their education.
This gave us the motivation to take up our project on the effect of the Digital Divide
in various forms on the Indian Education system.

Abstract:

Digital divide means the gap between two kinds of people: The Haves-the ones who have access to all the information via the internet and the Have-nots-who have limited to no access to the information due to lack of infrastructure ,Internet connection etc. This digital divide has serious implications on the education and in a way is hindering the basic Right to education and equality in education especially in the covid19 times since entire education got shifted to online many poor children living in rural areas who couldn't afford mobile phones or laptop have been away from any form of formal education for quite a while and even if they could afford there was no proper internet connectivity in some areas and often there was always a kind of Haves and Have-nots situation prevalent which in a way gave rive rise to inequality in access to education even to the people who go the same institution for studying and ideally should be getting the same resources to access education.

The 5 W's

In this project we study digital divide in India and mainly its effect on education based on various factors like Gender,Geographic location,Technology Literacy,Economic factors and how has covid19 pandemic made it worse .
The research population that we have tried to study is the Indian Students as a whole but provided the time constraints. we have taken a google form interview of students of Indian Institute of Technology Jodhpur and few other Institutes who belong from various areas and varied geographical locations which will give a great diversity to our research .To complement this data we have external datasets along with few targeted interviews on few poor children those live around our homes the ,details of which are provided in the later part.

When it comes to timeline we focussed on the time during the pandemic as It was during the pandemic that going to Institutions or schools was physically impossible and entire dependency of education was on online education and that reflected and highlighted the pre-existing digital divide in India.We also tried to compare the situation in pre-covid times to verify that indeed covid19 has highlighted the digital divide and due to the helplessness of the have-nots ,education for them was a very big challenge in the pandemic times.

We explored more into geographical location and its relation with digital divides like the relation of Internet connectivity and also the Infrastructure availability like electricity,devices like mobile phones with Geographical location.We also explored the relation of Technology literacy with Geographical locations.

As mentioned in the motivation it is very important to understand digital divide and the effect it has on education as , "*Right to Education*" is a fundamental right in India which implies education is legally guaranteed for all without any *discrimination.* Here the term discrimination is highlighted because specially in pandemic times when Online digital education was the only resort and the only way available to access education due to digital divide few under privileged groups had to face the discrimination as the dinot have access to the education during that time unlike the priviliged ones who were enjoying the privilege of education. It is really hurtful to call education a privilege but the digital divide has indeed made it a privilege for few groups and hence it is very important for us to study the effects of digital divide on education and try to understand various factors that are involved in it .

The research questions that we are mainly focusing on:

1. How big is the digital divide in India in the context of education?
2. What role does Geographical location play in the digital divide and how does it affect education?
3. What is the gendered digital divide?
4. What role does Financial situation play in the digital divide and how does it affect education?
5. How has Covid19 affected the digital divide in the context of education?

Few other questions that we could answer through our research

1. Relation between technology literacy and Geographical locations
2. Gender based discrimination in the context of education

2. DATA COLLECTION STRATEGIES

We have kept in mind the method during our Research, as following:-

• *Reduce the likelihood of overgeneralization*
• *Using systematic procedures*
• *Selecting individuals or groups to study*
• *So that they are representative of the individuals or groups to which we wish to generalize.*

We also kept in mind the Three Ethical Principles, as following:-

• Respect for persons:

Treating persons as autonomous agents and protecting those with diminished autonomy.

• Beneficence:

Minimizing possible harms and maximizing benefits.

• Justice:

Distributing benefits and risks of research fairly.

Following qualities that were kept in mind while collecting data from various sources:-

a. **DESCRIPTIVE** (social phenomena are defined and described)

b. **EXPLORATORY** (explores relatively unknown aspects of social phenomena)

c. **EXPLANATORY** (seeks to identify causes and effects of social phenomena)

d. **EVALUATION** (describes or identifies the impact of social policies and programs)

Various Data Collection techniques were used as follows:-

a. **Targeted Interviews :-**

The main aim for the data collection through targeted interviews[11] was to reach a wider set of people and understand the impact of digital divide and covid pandemic on their studies. We tried to understand the difficulties faced by the students in terms of the resources available to them and the disturbances which impacted their studies. We tried to understand the impact of the healthcare facilities on the students like were they provided with adequate healthcare facilities so that they could get treatment for the diseases and their studies should not get impacted.We also tried to understand how they are affected by their living habitat. Students dwelling in rural areas have been impacted the most after covid-19,so targeted interviews were mainly taken for them.

b. **Public-driven Survey :-**

Amidst the scare of COVID-19 Pandemic, we used the Google Forms-based Survey System[12] to understand the wholesome crux of **"Digital Divide"** in the context of various geographical locations like Villages, Sub-Urban Areas, and Metropolitan Cities. The survey was administered to students of various educational levels, including Middle-High Schooling students, Undergraduates, Postgraduates, and Doctorates, in order to obtain a broad range of opinions. During the survey, we were also able to capture the overall context of how geographical locations can maneuver students' mindsets for academic performance, the difficulties of travelling to another city, the availability of sufficient educational resources such as internet connectivity,

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system-compatible softwares, and so on, as well as the necessary technological literacy. To make the procedure more comfortable, the survey included single-choice and multiple-choice objective questions, with the assistance of bar-chart and pie-chart data visualisations for better comprehension.

c. **External Dataset :-**

We have also used many external datasets which we will explain here. The Mobile Gender Gap Report 2021 highlights how the mobile gender gap is huge in case of South-East Asian countries, especially in India. Internet Use Data for Asia-Pacific explains how female internet users are so less as compared to their male counterparts in this region of the world. All these dataset helped us understand the basic reason of gender based digital divide in India. The National Family Health Survey of India provided datasets which explains the rural-urban digital divide in India, how the rural broadband penetration is way lower than the urban broadband penetration. It also indicated that how these data vary for different states within India, some of them have a very narrow gap while others have high. A research paper from Harvard Kennedy School helped us understand barriers to and impacts of women's mobile phone adoption in India, it contains numerous interviews of many women across India with different backgrounds and all those interviews showed the variety of challenges they faced from the society for using mobile phones. Then there is the Unicef data on 'COVID-19 and School Closure' which contains data on how students managed their study during the lockdown and gave us a rough idea of how many students are at a risk of dropping out of school. A dataset from Nikore Associates noted that families exhibited a preference for male family members during the COVID-19 period.

d. **Articles-based Observation :-**

By going through different articles available on the internet we came to know about different consequences of digital divide, likeike digital divide caused by online classes will defeat the fundamental right of every poor child to study in mainstream schools, and during this pandemic many people were able to seek help through social media but the ones who have never heard of these are hopeless. The family of under-privileged students are already burdened with the loans. The students from tribal regions studying in residential schools have totally lost connections with their teachers post pandemic.

3. DATA ANALYSIS TECHNIQUES [13]

While searching for the research topic and analysing them according to varying aspects, we tested different topics on the basis of following metrics:-

a. **Feasibility:**

Can we start and finish an investigation of our research question with the resources that we can obtain and in the time that is available?

b. **Social Importance:**

Will an answer to our research question make a difference in the social world, even if that is only in terms of helping people understand a problem they consider important?

c. **Scientific Relevance:**

Does our research question help to resolve some contradictory research findings or a puzzling issue in social theory?

Here are the following data analysis procedures on the basis of varying aspects:-
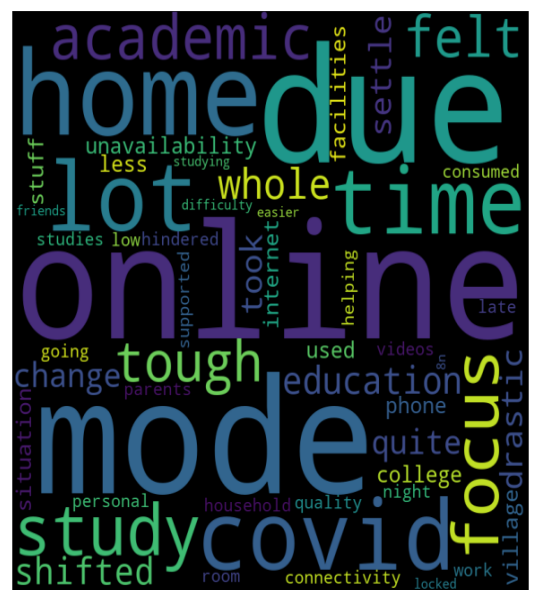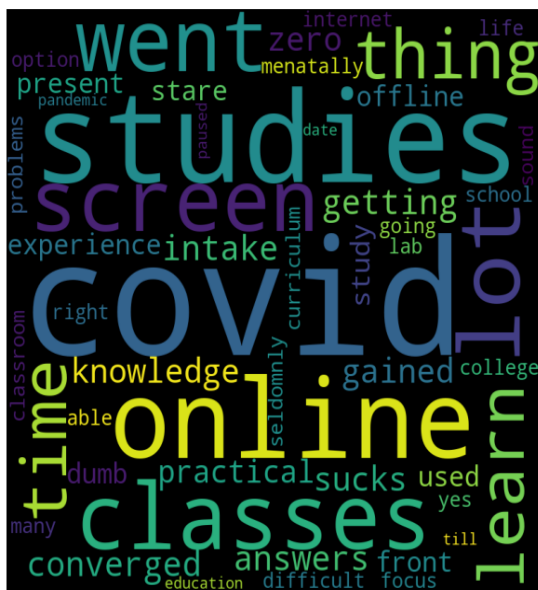
a. **Social Aspect**

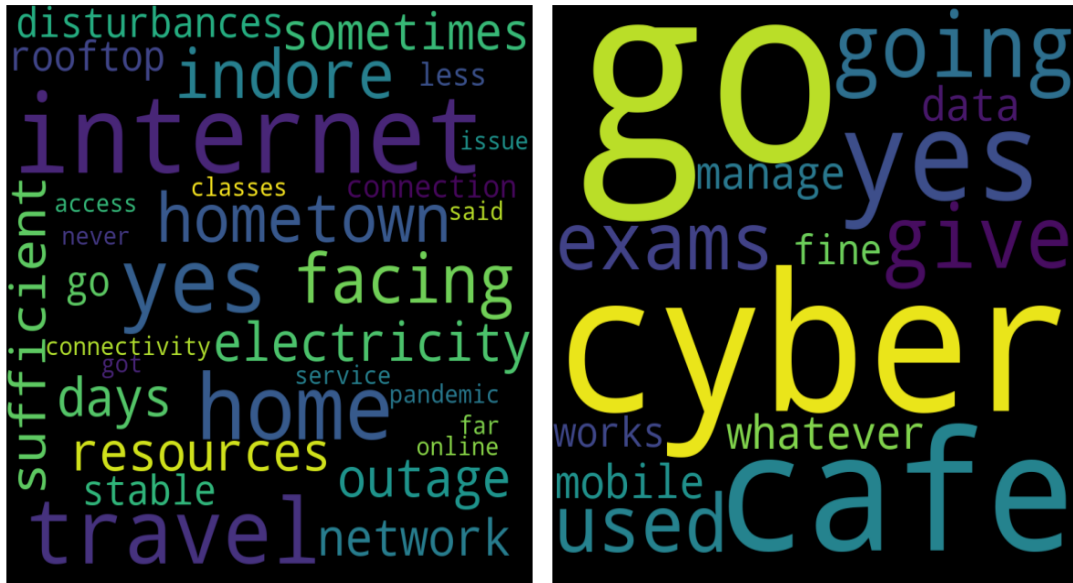**Q) Were you at your hometown during covid times?**

Q) Do you have any siblings? Equality in terms of education
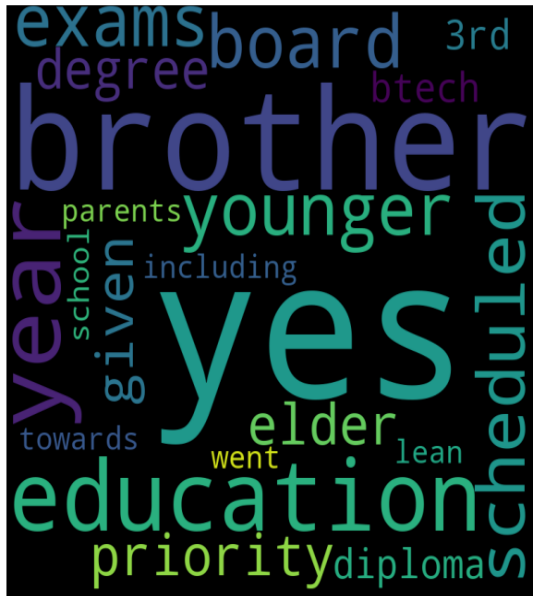
Q) Comparison in between your studies before and after covid

Q) Did Household work affect your studies? How?

Q) Were you provided with appropriate resources?

Q) Do/Did you have to travel far from your home to access internet services or other resources required for online education?

From the data collected through the google form it can be seen that the people living in rural areas had regular disturbance in their studies due to lack of internet, lack of resources, power cuts etc. From the word clouds it can be visualized that students had to travel from their hometown to get access to the resources.

There was also some impact of the gender on students like some of the female students were forced to do household work which disturbed their studies. Some girls were also not given equality in terms of the resources. Some boys were also forced to go outside and work with their father to help in generating income for daily needs.

We can see from the word clouds that the students were constantly facing some troubles and in some cases the health was affected. In some cases due to health problems in the families and lack of healthcare facilities students were depressed and it also affected their studies.

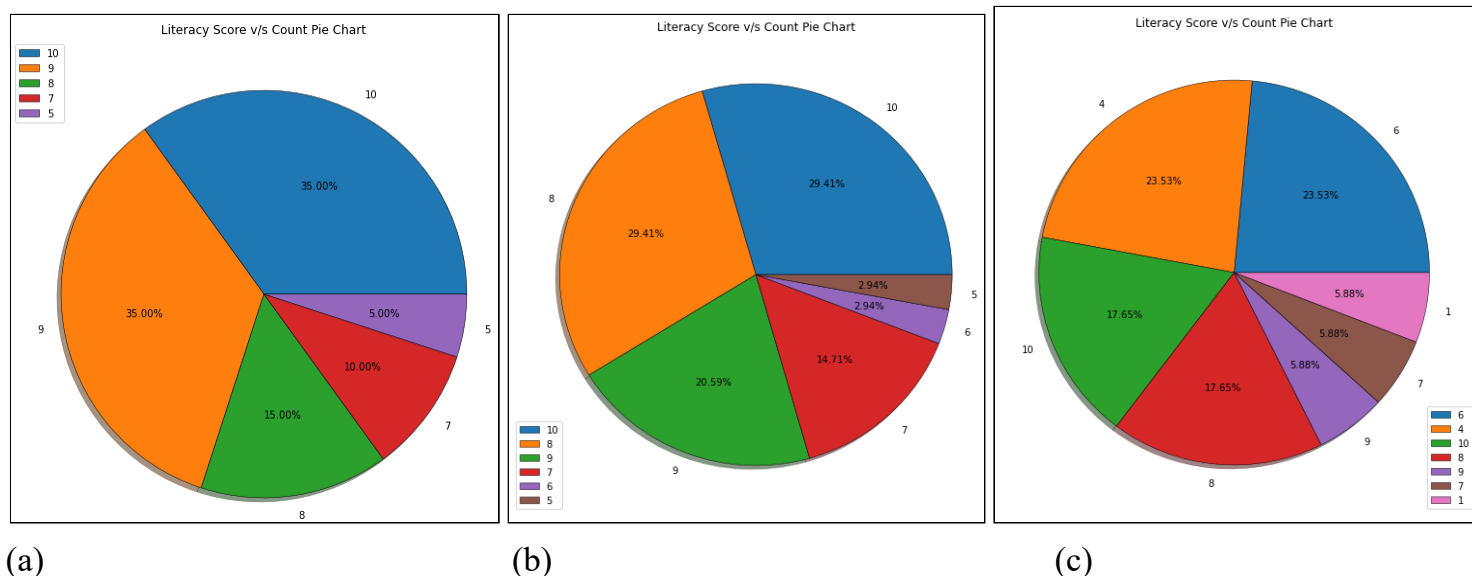b. <u>**Geographical and Technical Aspect**</u>

Fig1. Technical Literacy Score-based Pie Charts for (a) Metropolitan City, (b) Sub-Urban and (c) Village.

For the convenience of trend, we set the threshold for the suitable literacy to be a score of 5 out of 10. From the above mentioned pie-charts, maximum literacy scores attained were 10 each in Metropolitan Cities, Sub-Urbans and Villages, accounting for 35%, 29.41% and 17.65% respectively. On the other hand, lowest literacy scores attained were 5,5 and 1 in Metropolitan Cities, Sub-Urbans and Villages, accounting for 5%, 2.94% and 5.88% respectively. The average literacy scores attained were 8.8, 8.5 and 6.52 in Metropolitan Cities, Sub-Urbans and Villages respectively. The percentages of participants having the technical literacy scores below the threshold were 5%, 2.94% and 29.41% in Metropolitan Cities, Sub-Urbans and Villages respectively. In addition to these, the percentages of participants having the technical literacy scores below their geographical average scores were 25%, 50% and 52.94% in Metropolitan Cities, Sub-Urbans and Villages respectively.

(a)   (b)   (c)
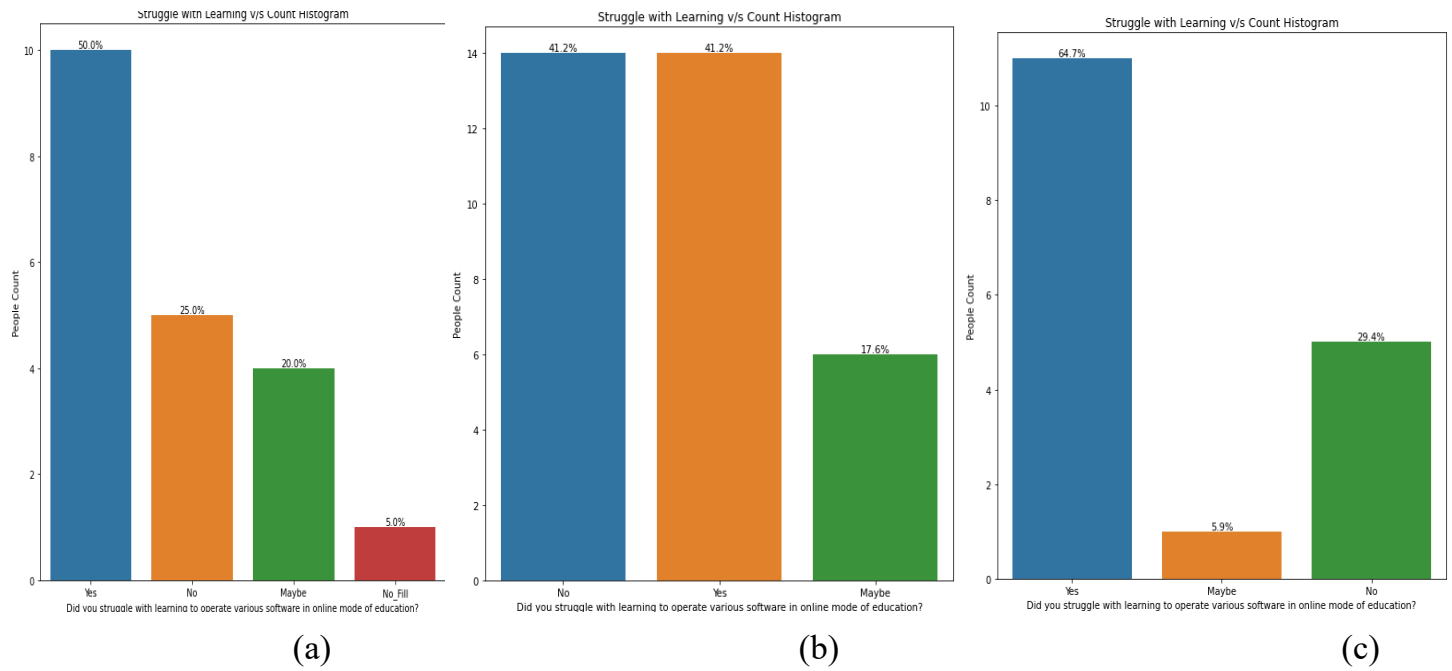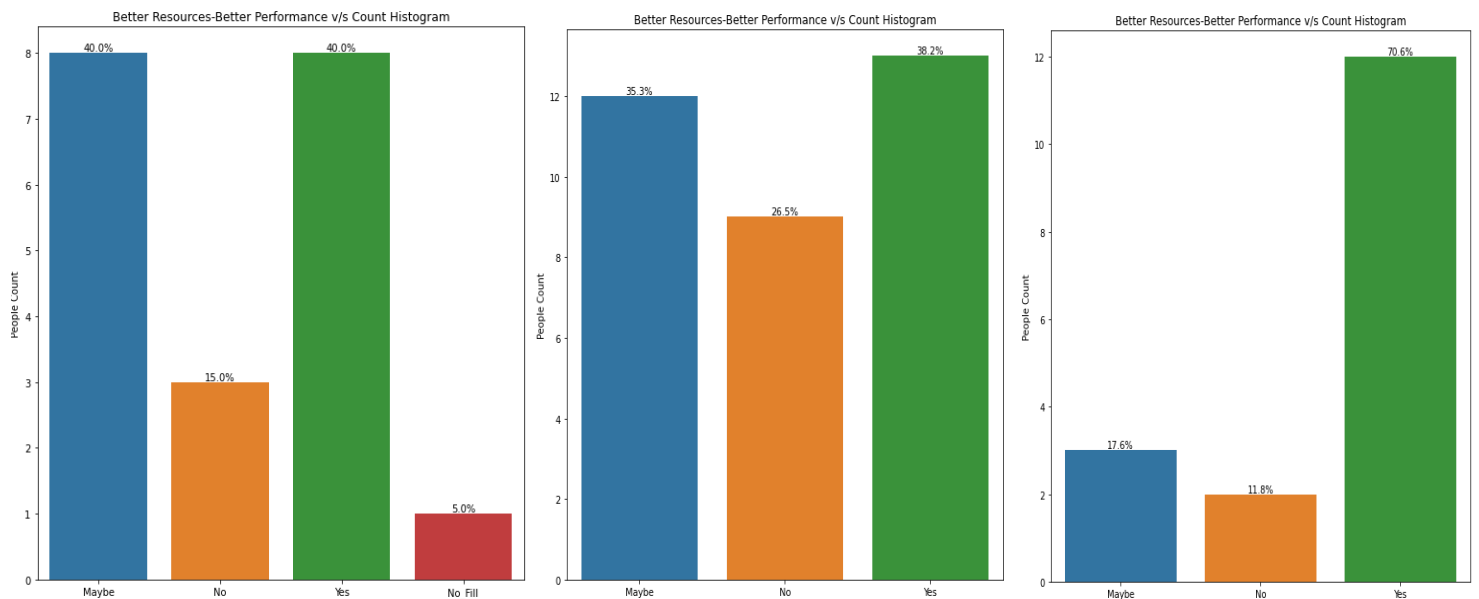
Fig2. Struggle with Learning-based Bar-Charts for (a) Metropolitan City, (b) Sub-Urban and (c) Village

For the convenience of trend, we set the threshold population percentage for the generalized opinion to be 50% of geographically-varied populations. Majority of the population in Metropolitan Cities, Sub-Urbans and Villages struggle with learning to operate various software in online mode of education, accounting for 50%, 41.2% and 64.7% respectively. Generalized opinion was "Yes" for students of Metropolitan Cities and Villages, whereas for the students of Sub-Urbans, it was close to "Maybe". The percentages of the population deviating from the generalized opinion were 50%, 58.8% and 35.3% in Metropolitan Cities, Sub-Urbans and Villages respectively.

Fig3. Better Resources-Better Performance based Bar-Charts for (a)
Metropolitan City, (b) Sub-Urban and (c) Village

For the convenience of trend, we set the threshold population percentage for the
generalized opinion to be 50% of geographically-varied populations. Majority of the
population in Metropolitan Cities, Sub-Urbans and Villages thought that their
batch-mates performed better than them in online instruction mode because they had
better resources (internet/infrastructure) at home, accounting for 40%, 38.2% and 70.6%
respectively. Generalized opinion was "Yes" for students of Villages, whereas for the
students of Metropolitan Cities and Sub-Urbans, it was close to "Maybe". The
percentages of the population deviating from the generalized opinion were 60%, 64.7%
and 29.4% in Metropolitan Cities, Sub-Urbans and Villages respectively.

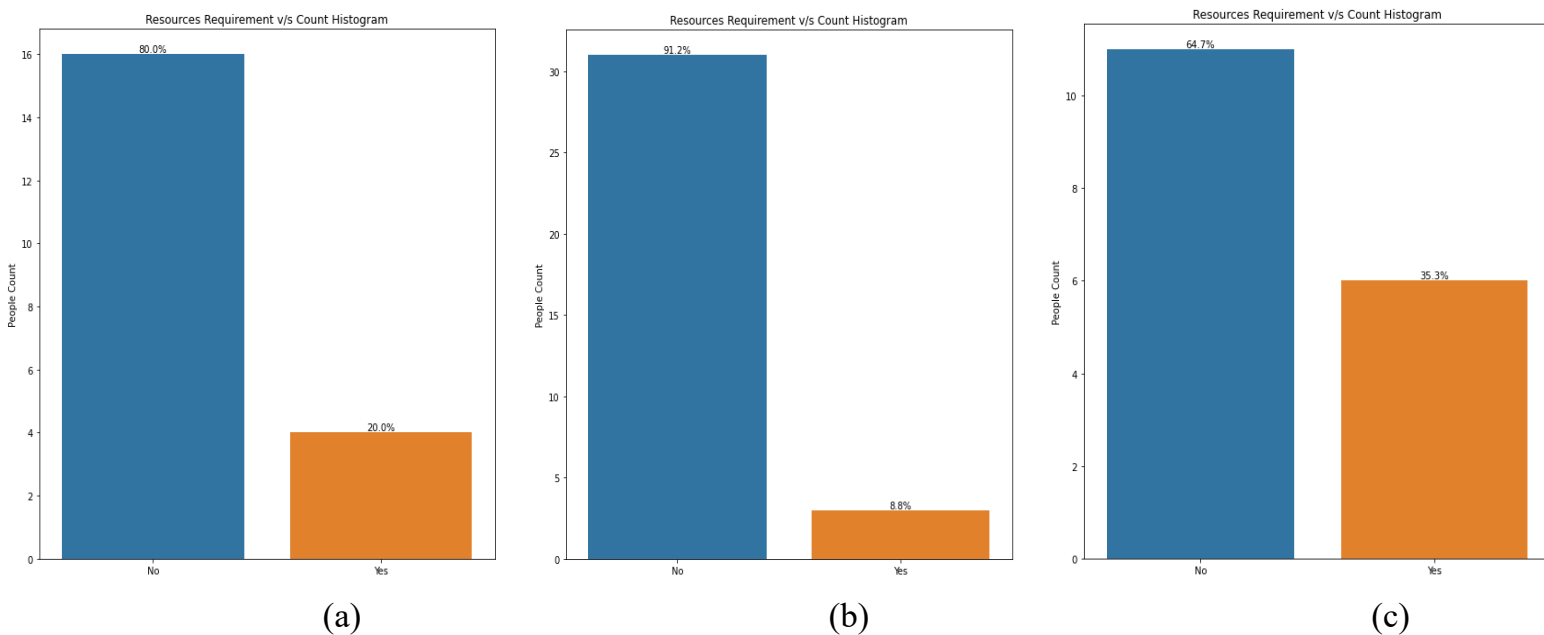(a)   (b)   (c)

Fig4. Resources Requirement based Bar-Charts for (a) Metropolitan City, (b) Sub-Urban and
(c) Village

For the convenience of trend, we set the threshold population percentage for the
generalized opinion to be 50% of geographically-varied populations. Majority of the
population in Metropolitan Cities, Sub-Urbans and Villages didn't think that they had to
travel far from their home to access internet services or other resources required for
online education, accounting for 80%, 91.2% and 64.7% respectively. Generalized
opinion was "No" for students of Villages, Metropolitan Cities and Sub-Urbans. The

percentages of the population deviating from the generalized opinion were 20%, 8.8% and 35.3% in Metropolitan Cities, Sub-Urbans and Villages respectively.

c. **Gender Aspect**

According to datasets mentioned in the references, Indian women are 15 percent less likely to own a mobile phone, and 33 percent less likely to use mobile internet services than men. In 2020, 25% of the total adult female population owned a smartphone versus 41% of adult men.

Despite the mobile ownership gap reducing from 26 percent to 19 percent, and mobile internet use gap from 67 percent to 36 percent, between 2017 to 2021, South Asia continues to have the widest mobile gender gaps globally.[1]
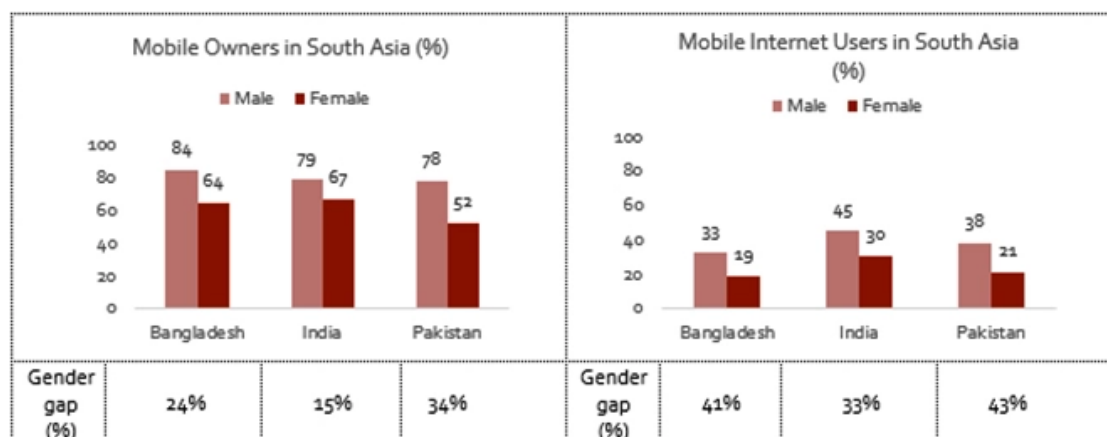
Within Asia-pacific, India had the widest gender gap in internet usage in recent years, a gender gap of 40.4 percent with only 15 percent of women accessing the internet versus 25 percent of men.[2]
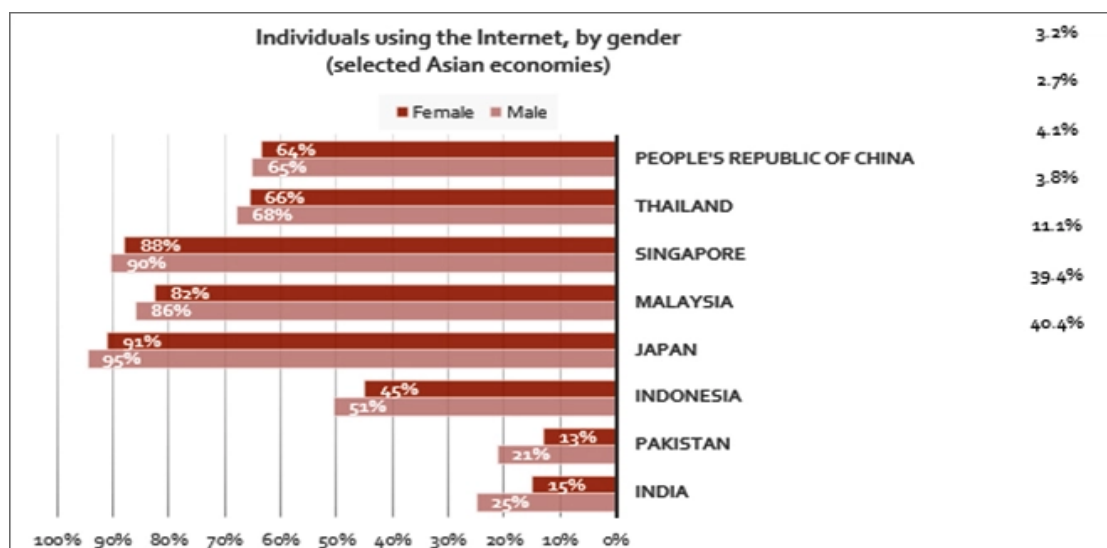
This gendered digital divide is often born out of a triple disadvantage for women in India.

- There is a rural-city digital divide, such that rural broadband penetration is simplest 29 percent towards a country wide common of fifty one percent. Across states, ladies are much less in all likelihood to personal cell phones, with this rural-city divide being the narrowest in Goa, Kerala, and Northeastern states, and the widest in West Bengal, Gujarat, Maharashtra, Andhra Pradesh, and Telangana.[3]
- There is a profits-primarily based totally digital divide among households. Given the common rate for records is US $0.68/GB in India, our estimates display that every GB of records expenses low-profits households (incomes much less than US$2/day) three percentage in their month-to-month profits as opposed to 0.2 percentage for middle-profits households (incomes US $10–$20 in keeping with day).[4]
- Finally, intra-family discrimination prevents ladies from equitably gaining access to digital gadgets in the home sphere, which in flip widens the gender-primarily based totally digital divide.

Even when mobile device ownership or use is permitted at the household level, women's online activity is often managed by men's relatives. While cell phones are considered a reputation risk for women before marriage; After marriage, phones are considered an interruption of caregiving responsibilities. Women often refrain from talking on the phone in public places, prefer to talk at home due to prevailing social norms and fear of being judged. In this social structure, women have been excluded from the development of the digital economy after COVID19, especially as they aspire to online education, job training, entrepreneurship and employment opportunities. [6][7]

From March 2020 to February 2021, schools in India close completely for 62% of instructional days and partially for 38%. This school closure has put 320 million students, including 158 million girls, at risk of dropping out and there are significant learning gaps. During this period, almost three-quarters of students in rural areas, in public/private schools, receive educational materials via WhatsApp, and nearly one in ten parents buy smartphones for online learning. . [8] [9] However, during consultations with our team at Nikore Associates [10], several stakeholders noted that families have shown a

preference for male family members. during COVID19. They ensure that their sons have privileged access to digital devices and data plans even when faced with income restrictions, but don't give their daughters the same treatment.

4. PROJECT CONCLUSIONS

Coming to conclusions we can now answer our research questions based on the data we have collected and also the data that we have gathered from various external resources now if we look at geographical data we categorized the data into three parts as shown in the data analysis part and it is reflected in the results that percentage of students from villages who had faced the issues like power cuts ,Connectivity issues and even in case of technology literacy the data from village suggests that they faced the problem with technology literacy and gave themselves lower scores in terms of technology literacy The average score was 6.52/10 but for sub-urban area the average score they gave themselves is 8.5/10 and in the cities was 8.8/10 from this we see that the students in village are less confident in terms of their technology literacy despite most of them belonging to a premier Institute of India.

Even in the question in the form that if they felt that their batch mates had performed better than them because of resources the percentage of people who filed yes in that case was more in the case of the village.

From the analysis that is done on the basis of gender with the help of external data and our targeted interview we can conclude that gender based digital divide is indeed prevalent and just like any other resource the women are facing discrimination in terms of access to information and technology too.It is quite evident from the targeted interviews we took that during the pandemic girls were forced more to do household work and were provided less in terms of resources (related to gadgets like mobile phones) and due to which their education took a serious hit .

As during pandemic students had no other option but to stay at home and be dependent on whatever resources were provided to them in terms of gadgets and Bandwidth, this combined with the digital divide had made education quite unfair as despite belonging to one institute (speaking in terms of data collected from college) where ideally all the students should be having access to equal resources as their performance is being tested based on that assumption but since that was not the case so we can fairly conclude that digital divide has serious implications on education system and the pandemic has made the impact of digital divide on education more serious.

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