Digital Divide and Learning Outcomes (Bloom's Taxonomy): Post-Pandemic Evidence from Uttarakhand

Shanchhith Singh Nayak*[1], Vipin Valiyattoor [†2] and Sreenath VS[‡2]

[1]CMHS-Indian Institute of Management Ahmedabad

[2]Department of Humanities and Social Sciences, Indian Institute of Science Education and Research Bhopal, Bhopal 462066, India

*Corresponding author. e-mail: shanchhithsingh@gmail.com

†e-mail: vipin@iiserb.ac.in

‡sreenath@iiserb.ac.in

Digital Divide and Learning Outcomes (Bloom's Taxonomy):

Post-Pandemic Evidence from Uttarakhand

Abstract : The gap in technology access brought on by one or more factors is known as the "digital divide." India has an internet penetration rate of only 40.40% as of March 2020, while Asia was rated second-to-last in internet usage. The key international elements contributing to the digital gap are gender, physical handicap, physical access, and a lack of ICT (Internet Communication Technology).

In the case of India, the language barrier, low literacy rate, and a few demographic factors are the leading causes of the digital divide. Our study uses Revised Bloom's Taxonomy, a pyramid-based analysis of six cognitive learning stages, to examine how the digital divide affects secondary students' educational outcomes. The pyramid's levels are conceptually distinct from one another. As a result, it is possible to test students on it and measure the degree of their cognitive learning outcomes. Thus, test questions are created, and using econometric tools, the answers to those questions and their scores are utilised to determine the extent of the digital divide. Students' answers are marked with a 1 or a 0, and the score is then multiplied by the weights, which are assigned to each level of the pyramid in increasing order from top to bottom in order to address potential bias. And the overall score gained is utilised in the equation to determine whether it depends on any other characteristics, such as gender, caste, locality, or the highest level of education of the guardians, besides digital access or knowledge. We could find a significant difference between the performance of male and female student. Having access to digital has a positive impact on remembering, evaluating and overall Bloomscore.

Contents

List of Figures

List of Tables

List of abbreviations

ICT	Information and communication Technology
NCERT	National Council of Educational Research and Training
ASER	Annual Status of Education Report
PMGDISHA	Pradhan Mantri Gramin Digital Saksharta Abhiyan
SSA	Sarva Shiksha Abhiyan
RMSA	Rashtriya Madhyamik Shiksha Abhiya
IAMAI	Internet and Mobile Association of India
RBT	Revised Blooms Taxonomy
NSS	National Sample Survey
CSC	Common Service Centers

'

1 Introduction

The digital divide can be categorised as the difficulty in accessing the digital device due to one or more reasons. Those factors could be a lack of digital knowledge, low literacy, problems in understanding language, lack of access to a good network, etc. During COVID-19, when everyone, including the government, focused more on digitising everything, the need for smartphones in rural India went unnoticed for several months. Then only a few schemes were launched which provided smartphones to students, but the need for digital knowledge was also prevalent among many rural users. Also, during COVID-19, there was a sharp decrease in internet speed and hampered video streaming for online classes in urban areas. Only a few people in rural India have access to smartphones, and switching to smartphones for a few is a comparatively new experience the lack of digital knowledge combined will further deepen the digital divide if the government keeps forcing students and other people to switch to full digital modes. Though the government has developed several digital initiatives, Kisan call centres and digital learning centres being a few, the problem is deeply rooted and can only be solved with point-to-point solutions over several years(Banerjee, 1996).

There are mainly three levels of the digital divide:

– Lack of access to the Internet and equipment

– Lack of practical use and necessary e-skill

– The performance associated with ICT(Information and Communication Technology)

The COVID-19 pandemic has brought to light the longstanding issue of the digital divide in India, especially in education. While the digital revolution has transformed how we access and share information, it has also created a gap between those with access to technology and those without access. This divide has significant implications for students, particularly those from marginalized communities, who often lack access to digital devices and internet connectivity(Basant and Sen, 2014).

In this context, this paper explores the relationship between the digital divide, access to information and communication technology (ICT), and cognitive learning outcomes among students in India. While several studies have examined the digital divide and its impact on education, few have used Bloom's Revised Taxonomy as a framework to assess cognitive learning outcomes in different subject areas(Ghatak, 2014) (Desai and Kulkarni, 2018) (Tewathia et al., 2020).

The paper draws on existing literature to explore the disparities in access to education among different socio-religious communities and castes in India. It highlights the findings of various studies showing that marginalized communities, such as the SC, ST, and OBC, often have limited access to education and ICT. The paper also examines the relationship between household education levels and access to ICT, suggesting that higher levels of education often lead to greater access to ICT and improved learning outcomes(Deshpande and Newman, 2007) (Banerjee, 1996) (Muhayimana et al., 2022).

Using Bloom's Revised Taxonomy as a framework, the paper assesses students' cognitive learning outcomes in different subject areas, including English language, social studies, math, and science. It argues that the lack of access to ICT and better learning techniques have contributed to a decline in cognitive learning among students in India, particularly those from marginalized communities. This paper underscores the need for policymakers and educators to address the digital divide in education and adopt better learning techniques to improve cognitive learning outcomes among students in India. It recommends increasing investment in ICT infrastructure and providing greater access to digital devices and internet connectivity for marginalized communities to bridge the education gap and ensure equal opportunities for all students.

2 Literature Review

2.1 Internet Communication Technology

Considering the ownership of ICT assets across Indian households, a clear pattern of caste hierarchy emerges. Out of various ICT assets, mobile phones are predominant. It is found that computer knowledge is possessed by the individuals belonging to the castes who also have higher ownership

of the ICT assets. We can assert that, in a way, one's class background helps determine how effectively one uses ICT assets. With ICTs becoming an increasingly important medium of social interaction, those who need access to ICT, specifically the Internet, may be included in the primary communication channels. This exclusion weakens the building of social capital and other socio-political and economic resources. These resources and social capital are tapped (and built) by privileged social groups and economic classes. Relating ICT assets with occupation gives us a fair understanding of the more weighted term "prestige." Some studies showed that SCs and STs earn significantly lower wages overall and are given less prestigious jobs than upper or dominant castes, which can further widen the gap in access to digital devices and technology(Thorat and Attewell, 2005).

ICTs in India have become a central part of the Indian educational system, especially for higher and professional education. Even with programmes around universal education and the Right to Education Act 2009(Rig, 2009), substantial variations in school quality, teachers, material, curriculum, and pedagogy reproduce exclusion and marginalise a vast population. Such marg-inalised students are naturally directed to an unskilled working class or a lower class. Rather than equalising class relations, education ends up duplicating class inequality. In the era of ICTs, computer use skills have emerged as inevitable necessities, almost as a necessary platform for further knowledge and skill building. Possessing such a base may be used to maintain a class advantage, while the lack of it aggravates the disadvantage(Rao, 2007). Command over the English language - an excellent gift for participation in the formal economy and more secure employment - is fragile among those from historically deprived castes. On the contrary, upper and dominant castes have a stronghold over English, over higher/technical education, and are observed to have a better grasp on ICT skills (demonstrated by their dominance over the more high-skilled professions in India)(Deshpande and Joseph, 2003).

Empirical evidence show that, ICT assets' ownership, skill and usage also increase as the household's highest adult education level increases. In other words, an individual from a deprived caste has lower chances of being literate and skilfully employing ICTs and improving well-being, as they

are not well-endowed with social capital. We assert that class background helps determine whether one fruitfully operates ICT assets. Even if disadvantaged households own ICTs, they tend to use them more for entertainment purposes than privileged families that use them instrumentally. ICT usage is the maximum for upper caste households and minimum for ST households (Deshpande and Joseph, 2003).

2.2 Cognitive Learning and its importance

Cognitive learning is gaining information and comprehension using brain functions like perception, logic, recollection, and intuition. It is a crucial component of human learning because it allows us to organise and comprehend information to use it to make choices and address issues.

Cognitive learning is essential to human growth because it enables people to learn new things, improve their critical thinking abilities, and make wise choices. People can comprehend and use challenging ideas in real-world contexts through cognitive learning. This is crucial in the modern world, where people must constantly adjust and pick up new skills due to technological development. Cognitive learning is essential to human growth because it enables people to learn new things, improve their critical thinking abilities, and make wise choices. People can comprehend and use challenging ideas in real-world contexts through cognitive learning. This is crucial in the modern world, where people must constantly adjust and pick up new skills due to technological development(Mayer, 2008).

There are numerous ways for people to improve brain development. One efficient method is active learning, which entails actively engaging in the learning process instead of merely idly listening to lectures or perusing textbooks. Active learning encourages people to interact with and implement the material in real-world circumstances through conversations, problem-solving activities, and group tasks. Utilizing technology-based learning aids, such as online classes and instructional applications, is another efficient way to improve cognitive learning. These tools can give users access to various resources and knowledge and a more dynamic and exciting learning experience(Kirschner et al., 2006).

Promoting a supportive learning environment is crucial if people are to engage with the subject matter and grow to love learning. This may entail fostering a welcoming and accepting learning atmosphere in the classroom, letting students pursue their interests, and motivating them to take responsibility for their education. A fundamental component of human development, cognitive learning is essential for academic achievement, career advancement, and personal development. Individuals may obtain the skills and knowledge necessary to thrive in today's quickly changing world by boosting cognitive learning through active learning, technology-based tools, and a pleasant learning environment. Thus, it is crucial to focus on cognitive learning and support practical approaches for improving it in all spheres of life (Hattie and Yates, 2013).

2.3 Rural Education in India

Every person has the fundamental right to education, which is also the basis for socioeconomic growth. However, education has proven to be a significant obstacle in India, particularly in rural regions. The literacy rate in rural regions is only 69%, whereas it is 86% in urban areas, according to the 2011 Census. One of the fundamental causes of this gap is the absence of access to high-quality education. The difficulties and possibilities of rural education in India are examined in this essay(Chandramouli and General, 2011).

Infrastructure is one of the main obstacles to rural education in India. Essential services like power, potable water, and transportation are sometimes lacking in rural regions. This makes it challenging for schools to run efficiently. Another difficulty is the dearth of skilled instructors in rural regions. More than 40% of rural schools only have one teacher, and many of those instructors lack the essential credentials and training, according to research by the National Council of Educational Research and Training (NCERT). The lack of knowledge and interest on the part of parents presents another difficulty for rural education. Parents in many rural communities do not stress the value of education to their kids and discourage them from attending school. Girls, who are frequently expected to assist with domestic duties or be married at a young age, are particularly affected by this. Another significant worry is the calibre of education offered in rural communities. Only 53%

of Class 5 children in rural regions, according to the Annual Status of Education Report (ASER), can read a text at the Class 2 level. Additionally, rural schools may have obsolete curricula that do not match the requirements of the children.

There are several options for rural education in India, notwithstanding the difficulties. Technology utilisation is one of the most promising options. E-learning has emerged as a powerful method of delivering high-quality education as technology becomes more widely accessible in rural places. The Digital India programme and the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) are only two of the government of India's endeavours to encourage e-learning in rural regions. Community involvement is an additional possibility for rural education. Students do better when parents and communities are active in the educational process. Parent-teacher associations, school management committees, and community-based organisations are examples of how the community may get involved. The Indian government has introduced several initiatives to raise the standard of education in rural regions. The government's primary initiative, the Sarva Shiksha Abhiyan (SSA), strives to make high-quality education accessible to everyone. Another initiative that seeks to raise the standard of secondary education in rural regions is the Rashtriya Madhyamik Shiksha Abhiyan (RMSA).

India's rural education system has several difficulties, including a lack of infrastructure, a teacher shortage, and insufficient parental awareness. However, there are several options as well, including the use of technology, community involvement, and government initiatives. To guarantee that every kid in rural India has access to a high-quality education, it is crucial to solve these issues and grab these possibilities.

2.4 Impact of COVID-19 on Education in Rural India

Globally, the COVID-19 pandemic has significantly impacted education due to several institutions and colleges closing to stop the virus's spread. The epidemic in India has notably impacted the school system in rural regions, where there is a lack of infrastructure and resources.

Millions of children in rural India have had their schooling disrupted by the pandemic, with many schools being closed for extended periods. 60% of students in rural regions didn't attend any online lessons during the shutdown, according to research by the National Council of Educational Research and Training (NCERT). This problem has been exacerbated by the absence of power in specific communities, internet connectivity, and access to digital gadgets (National Council of Educational Research and Training (NCERT), 2020).

In rural regions, there has also been a rise in dropout rates due to extended school closures. According to research by Oxfam India, around 50% of the students who participated in the poll had little interest in finishing their education. Dropouts were primarily attributed to financial hardships and the necessity for youngsters to work to support their families (India, Oxfam, 2020).

Teachers in rural regions have faced several difficulties due to the pandemic. Since schools were closed, instructors were forced to become accustomed to teaching online, which was unfamiliar to many of them. The move to online education has been made even more difficult by the fact that many teachers lack training in the use of digital technologies(Ray, 2021).

The pandemic's interruption has significantly impacted learning results in rural regions. According to a study by the Centre for Sustainable Employment at Azim Premji University, the pandemic significantly negatively impacted learning levels. Additionally, the study indicated that it was more challenging for students from socially disadvantaged households to attend online education (Vaidya, 2021).

The epidemic has made it clear that government action is needed to enhance the educational system in rural areas. The government has created several programs to promote digital literacy among residents in rural regions, such as the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA). NGOs have also been critical in helping to support teachers and kids during the epidemic(Sood and Narayanan, 2020).

Education in rural India has been significantly impacted by the COVID-19 epidemic. Millions of youngsters in rural regions have had their education impacted by school closures, a lack of digital gadgets and internet connectivity, and budgetary limitations. To close the digital gap, the

government must act to strengthen the educational system in rural regions and give access to digital tools and infrastructure. NGOs are also essential in helping to support kids and teachers through these difficult times.

2.5 The digital divide in Rural India

The disparity between individuals who have access to digital technology and those who do not is called the "digital divide." This difference is pronounced in rural India. About 13% of India's rural areas gained internet connectivity in 2019, according to a study from the Internet and Mobile Association of India (IAMAI) from 2020. This indicates that an astounding 87% of rural residents are shut off from the digital world. The impact of the digital divide on rural people in India is extensive. People are unable to benefit from everything that modern technology has to offer without internet connectivity. This includes access to online education and training, job opportunities, telemedicine, e-commerce, and digital banking services. The lack of access to digital technology is a significant barrier to economic development and social mobility in rural India.

The absence of infrastructure in rural India is one of the main causes of the digital divide. The infrastructure required to facilitate internet access is lacking in many rural locations. This covers infrastructure like internet networks, cell towers, and steady electrical supplies. In addition, the cost of digital gadgets like cell phones, PCs, and internet connectivity is sometimes unaffordable for residents in rural regions(IMAI (Internet and Mobile Association of India), 2020).

The absence of digital literacy in rural areas is a crucial factor behind the digital divide. Many residents in rural areas are unfamiliar with and unable to use digital technologies. They are unable to use digital resources and services due to a lack of knowledge and abilities(World Bank, 2020a). The Indian government has taken action to address the issue of closing the digital gap in rural regions after realising its significance. The Digital India campaign, introduced in 2015, is one of the major efforts. The campaign aims to provide digital infrastructure and services to all citizens, including those in rural areas(Government of India, 2015).

The government has introduced several programmes as part of Digital India's pushes to narrow the digital divide in rural regions. They include the BharatNet initiative, which intends to provide high-speed broadband internet to India's rural areas. A network of community service centres will be used to deliver digital services like e-commerce, telemedicine, and e-governance to rural regions under the Common Service Centers (CSC),initiative, which the government has already launched(Government of India, 2011). The digital gap in rural India persists as a significant issue despite these measures. In India, just 29 per cent of rural regions have internet access, compared to 64 per cent of metropolitan areas, according to a World Bank assessment from 2020. The research also mentions that access to digital resources and services is more difficult for women and girls living in rural regions, making the digital gap more pronounced for them(Singh, 2017).

There is a need for ongoing investment in digital infrastructure, digital literacy initiatives, and reasonably priced digital devices to solve the digital divide in rural India. The digital gap must be closed via community-based strategies, including local players from the public and business sectors and local governments(Singh, 2017).

2.6 Acess to digital devices in rural india

The digital revolution has influenced nearly every part of our life, from communication and entertainment to education and healthcare. The advantages of digital technology are not uniformly dispersed, and India's urban and rural areas suffer from a sizable digital gap. Lack of access to digital devices in rural regions is one of the leading causes of this gap. The Internet and Mobile Association of India (IAMAI) reported in 2019[1] that just 13% of rural India has access to the internet. Although the government has started several programmes to solve this problem, such as the BharatNet project and the Common Service Centers (CSC) programme, the lack of access to digital devices remains a significant obstacle.

Results of Sharma and Kumar (2016) show that that the price of digital devices, such as smartphones and laptops, is a substantial barrier to their adoption in rural regions (Sharma and Kumar,

---

[1] (IMAI (Internet and Mobile Association of India), 2020)

14

2016). According to the report, digital gadgets are frequently more expensive in rural than in metropolitan regions, making them less accessible to those who live there. Gupta and Bala (2019) has also highlighted the relevance of having access to digital devices for education in rural places (Gupta and Bala, 2019) According to the study, having access to digital devices can greatly increase rural residents' access to learning materials and educational opportunities. However, the report highlights one important obstacle to using digital technology in rural education: the lack of access to digital devices. Earlier studies highlight the importance of community-based initiatives in enhancing access to digital devices in rural regions. According to Gupta and Bala (2019), community-based strategies that include local players from the public and commercial sectors and local governments can increase access to digital devices in rural regions(Gupta and Bala, 2019) .

In addition to this research, several projects and programmes are designed to increase rural residents' access to digital devices. For instance, the Digital India programme of the Indian government strives to make digital infrastructure and services accessible to all residents, including those who live in rural regions. The government has undertaken several measures as part of the campaign, including providing digital literacy programmes for rural populations and distributing inexpensive tablets to students in remote regions(World Bank, 2020b).To close the digital gap in India, it is imperative to address the problem of rural people's limited access to digital technology. While several projects and programmes are designed to provide access to digital devices in rural regions, more funding and community-based strategies are required to guarantee that all residents can benefit from digital technology(Press Trust of India, 2021).

Lack of access to digital devices in rural India contributes to a digital gap between urban and rural regions. But, studies worldwide show how crucial it is for rural communities to access digital devices for economic development, healthcare, and education. To ensure that all citizens have access to the advantages of digital technology, addressing this problem need huge investment and community-based methods(MoEI, 2021).

2.7 Revised Bloom's Taxonomy: Background Relevance

A hierarchical system for arranging learning objectives, assessments, and activities is provided by the revised bloom taxonomy (RBT). Initially developed by Benjamin Bloom in 1956, the taxonomy was revised in 2001 by a group of cognitive psychologists led by Lorin Anderson to reflect current research on learning and teaching better (Krathwohl, 2002). The RBT has gained popularity as a tool for educators and instructional designers since it is made to be more adaptable and relevant to contemporary educational environments. Six categories, which are placed in a pyramid shape, make up the RBT's structure. These are the categories: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating. Each category represents a different level of cognitive complexity, with Remembering being the lowest level and Creating being the highest level.
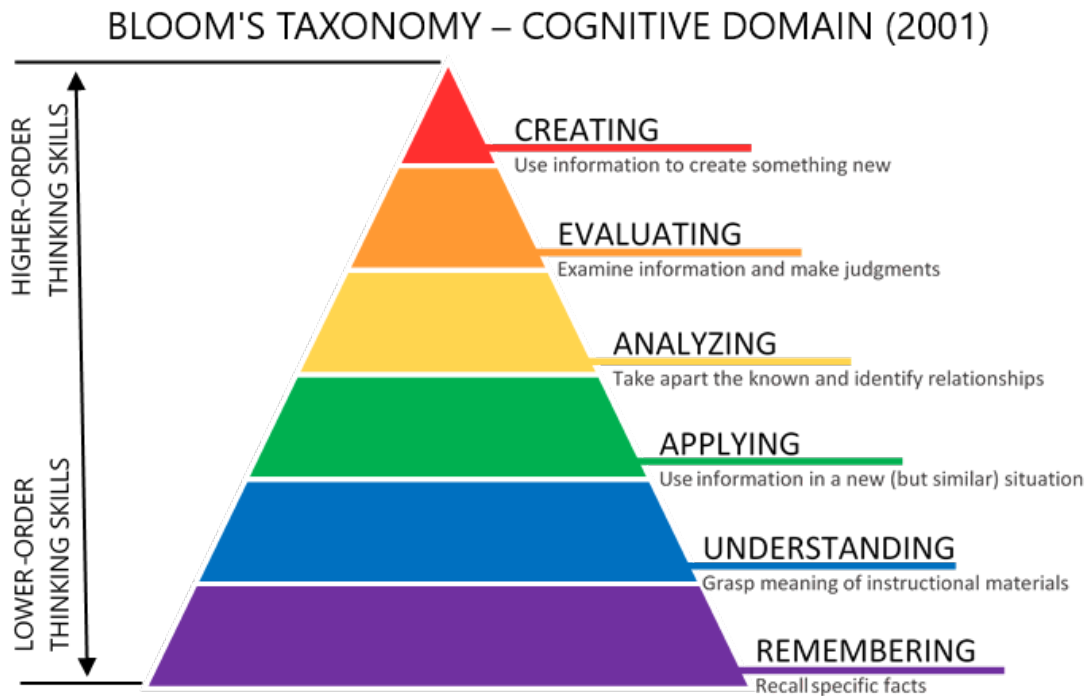

Fig. 1 Revised Bloom's Taxonomy.

Six Categories of Revised Bloom's Taxonomy :

- **Remembering:** The RBT's first category is Remembering. This category deals with remembering or recognising facts, theories, or concepts. The simplest degree of cognitive complexity is remembering, which includes retrieving information from memory.

- **Understanding:** Comprehension is the second category of the RBT. Understanding or understanding facts, ideas, or concepts falls under this category. Comprehension needs the capacity to give meaning to the knowledge, which goes beyond mere memorization.

- **Applying :** Applying is the RBT's third category. This category focuses on the capacity to apply knowledge, thoughts, or ideas in a novel circumstance or setting. Applying is the capacity to apply information in different contexts, and it calls for a higher level of comprehension than Remembering or Knowing.

- **Analyzing :** The RBT's fourth category is analysing. The capacity to dissect data into its constituent pieces and spot trends, links, or connections between those elements falls under this category. Comparing the cognitive difficulty of remembering, understanding, and applying, analysing is more difficult.

- **Evaluating :** Evaluating is the RBT's fifth category. The capacity to evaluate the worth or quality of knowledge, thoughts, or ideas falls under this category. Unlike analysing, evaluating needs greater cognitive complexity and the capacity to employ criteria and evidence to arrive at well-informed choices.

- **Creating :** The RBT's last category is Creation. This category refers to the capacity to produce fresh concepts, ideas, or goods using previously acquired information or expertise. The ability to create demands the highest level of cognitive complexity and the capacity to apply originality and creativity to solve issues or develop novel ideas.

3 Methodology

3.1 Research Design

For the present study, we use Survey Data collected in January and February 2023. For our Survey, we use class eight and ninth Students of Government Schools as our subjects. Schools are from

Sugam and *Durgam*categories as defined by Uttarakhand Annual Transfer for Public Servants Act 2017 .

Sugam and *Durgam* : The Uttarakhand Government defines the Sugam and *Durgam* regions in the Transfer of Land (Regulation) Act 2017. According to the act, the Sugam region refers to areas that are easily accessible by road and have basic infrastructure such as electricity, water supply, and health facilities. These areas are considered suitable for development and are open for transfer and sale of land. On the other hand, the *Durgam* region refers to remote, inaccessible areas that lack basic infrastructure. These areas are ecologically sensitive, and the transfer or sale of land in such regions is restricted. The act aims to regulate land transfer in the *Durgam* region to prevent ecological damage and maintain the area's natural beauty. Previously the "*Durgam*" region was the areas that were situated at the height of 1500 meters or more above sea level or areas that required more than a day's walk to reach from a Motorable road.

The data collected over ten schools, four *Durgam* and 6 Sugam, has 560 observations, among which 450 are students, 100 are teachers, and 10 are headmasters/principals.

Survey : In this study, a survey was given to 560 participants, including 450 Students, 100 instructors, and ten principals from various rural Indian schools. The survey's main goal was to determine how the Digital Divide and lack of access and prior knowledge of digital devices affected rural Indian students' Critical Learning abilities. Twenty Students from class 8 and twenty-five from class 9 were randomly chosen from each surveyed school to ensure a varied representation of students. This strategy was adopted to prevent any potential biases in choosing candidates with outstanding academic records. Two schools with sole girls were included to improve the dataset's coverage of girls.

There were both multiple-choice and open-ended questions on the survey form. The survey questions were created to gather data on various factors of the Digital Divide's effects on school children. The questionnaire for the students contains questions on availability to digital devices, internet connectivity and on the efficiency of online classes. It also included few questions on how involved they were in their studies during the epidemic and the challenges that they have faced

Fig. 2 Surveyed Districts on Map

during this period. The questionnaire for teachers and administrators contain questions on problems of teaching online, the efficacy of online teaching strategies, the degree of student participation in online courses, and the difficulty of teaching during the pandemic. It was anticipated that the replies from teachers and principals would give a general overview of the school and their assessment of the efficacy of the steps made to lessen the pandemic's effects on education.

The survey data were analysed using linear regression to gain valuable insights. The survey's findings should shed light on the impact of the digital divide and the lack of its knowledge on school children. The study's results are anticipated to support continuing initiatives to raise the standard of education in rural India, particularly in the aftermath of the COVID-19 pandemic. This study attempted to understand better how the COVID-19 outbreak affected rural Indian students'

academic performance. By including participants from several rural Indian schools, including principals, instructors, and students, the study used a complete approach. The results of this study are anticipated to offer insightful information that that help the educators and policymakers in framing practical plans to lessen the adverse effects of pandemics and other crises on the education of pupils in rural India.

3.2 Data and Variables

There are 144 variables on which data is collected, among which 16 are used for econometric analysis, and the rest are descriptive variables used to capture an overview of students' backgrounds and perceptions of teachers and principals. Among these 16 variables, seven are used as dependent variables having one at a time in linear regression, and the rest 8 are independent variables in all the linear regression models.

Response to questions is either given full marks or zero to avoid partial marking. The obtained marks are multiplied by pre-determined weights, which are constant for all seven dependent variables. Then the total bloom score is calculated by subject-wise adding marks obtained in all six categories.

Table 1 Variables used for linear Regression

Variable Used for Linear Regression		
Variable Name	Description	Accepted Values
Bloomscore	Sum total of all the bloom categories	0-100
Remembering	Total Score in Remembering Category	0-5
Understand	Total Score in Understanding Category	0-10
Apply	Total Score in Applying Category	0-15
Analyze	Total Score in Analysing Category	0-20
Evaluate	Total Score in Evaluating Category	0-23
Create	Total Score in Creating Category	0-27
Category	Category of School	1=sugam;0=$Durgam$
Caste	Caste of Student (gen,obc,sc, st)	1=Gen; Rest=0
Religion	Religion of the student (Hindu, Muslim, Sikh, Christian, others)	1=Hindu;rest=0
Prior	Prior digital knowledge (less, mediocre, expert)	less=1;rest=0
Gender	Gender of the student (Male, Female)	female=1;male=0
Network	How often did they face difficulty using a digital device (Always, Sometimes, Never)	Always=1;Rest=0
Problem	Type of problem faced during online classes (Network, Electricity, Network and Electricity)	Network and Electricity=1;Rest=0
Device	Availability of the personal device (yes, no)	yes=1;no=0

A few Teacher-specific Variables also capture teachers' perceptions about students learning and understanding capabilities before and after COVID-19.

Table 2 Teacher Specific Variables

Variable	Description	Accepted Values
t_1	Gender:	male/female
t_2	Qualification:	graduate/postgraduate/doctrate
t_3	Age:	age
t_4	Do you have a personal phone/digital device	yes/no
t_5	challenges in using digital devices	technical/non-availability/no data
t_6	Was it easy to get access to the digital device	yes/no
t_7	What is your perception of ICT usage for outstanding learning during the pandemic	positive/negative/neutral
t_8	Concentration in class	same/increased/decreased/no comments
t_9	Problem-solving capability	same/increased/decreased/no comments
$t_1 0$	Interaction with teachers	same/increased/decreased/no comments
$t_1 1$	Answering questions in class	same/increased/decreased/no comments
$t_1 2$	Answer writing in class	same/increased/decreased/no comments

Table 3 Summary of Scores

Variable—	Obs	Mean	Std. Dev.	Min	Max (Obtained)	Max
Bloomscore	450	43.41	12.29	13.25	69.17	100
Remember	450	1.92	1.024	0	4.25	5
Understand	450	3.97	1.86	0	9.17	10
Apply	450	6.99	3.14	0	13.75	15
Analyze	450	8.67	3.28	0	18.67	20
Evaluate	450	9.86	3.41	0	21.28	23
Create	450	11.46	3.8	0	25.4	27

3.3 Data Analysis

To access the impact of digital divide and factors related to it impact the critical learning abilities of students, we used simple linear regression. Overall Bloom Score of students as well as its six different components were taken into account in this regard

For estimating our model, we use seven dependent variables, namely, 'total bloom score', 'remembering', 'understanding', 'applying', 'analyzing', 'evaluating', and 'creating' in each model. And eight independent variables used for our analysis are - category of school, gender of student, the caste of a student, religion of student, prior knowledge of the device, Access to the network,

type of problem faced by the student and the all-time availability of the device for personal use.

$$TotalBloom = \beta_0 + \beta_1 \cdot cat + \beta_2 \cdot Gender$$

$$+\beta_3 \cdot relegion + \beta_4 \cdot caste + \beta_5 \cdot network + \beta_6 \cdot problem + \beta_7 \cdot device + \epsilon$$

$$\tag{1}$$

$$Remember = \beta_0 + \beta_1 \cdot cat + \beta_2 \cdot Gender$$

$$+\beta_3 \cdot relegion + \beta_4 \cdot caste + \beta_5 \cdot network + \beta_6 \cdot problem + \beta_7 \cdot device + \epsilon$$

$$\tag{2}$$

$$Understand = \beta_0 + \beta_1 \cdot cat + \beta_2 \cdot Gender$$

$$+\beta_3 \cdot relegion + \beta_4 \cdot caste + \beta_5 \cdot network + \beta_6 \cdot problem + \beta_7 \cdot device + \epsilon$$

$$\tag{3}$$

$$Apply = \beta_0 + \beta_1 \cdot cat + \beta_2 \cdot Gender$$

$$+\beta_3 \cdot relegion + \beta_4 \cdot caste + \beta_5 \cdot network + \beta_6 \cdot problem + \beta_7 \cdot device + \epsilon$$

$$\tag{4}$$

$$Analyze = \beta_0 + \beta_1 \cdot cat + \beta_2 \cdot Gender$$

$$+\beta_3 \cdot relegion + \beta_4 \cdot caste + \beta_5 \cdot network + \beta_6 \cdot problem + \beta_7 \cdot device + \epsilon$$

$$\tag{5}$$

$$Evaluate = \beta_0 + \beta_1 \cdot cat + \beta_2 \cdot Gender$$

$$+\beta_3 \cdot relegion + \beta_4 \cdot caste + \beta_5 \cdot network + \beta_6 \cdot problem + \beta_7 \cdot device + \epsilon$$

$$\tag{6}$$

$$Create = \beta_0 + \beta_1 \cdot cat + \beta_2 \cdot Gender$$

$$+\beta_3 \cdot relegion + \beta_4 \cdot caste + \beta_5 \cdot network + \beta_6 \cdot problem + \beta_7 \cdot device + \epsilon$$

$$\tag{7}$$

We run the above equations to know the possible relationship between them. Not many studies use such methods to predict any relation between them.

4 Results

4.1 Empirical Findings and Discussion

This study examines the impact of digital devices and other factors on educational outcomes for students in rural areas of India. Our empirical results suggest that the availability of digital devices positively impacts studentsâ critical learning, remembering, and evaluating capabilities. This finding emphasizes the potential for digital education to contribute to better educational outcomes for students in rural areas. However, the negative effect of always having problems while using digital devices highlights the need for training and support for students in using these technologies effectively.

Moreover, our findings indicate that being female has a negative effect on all seven scores, consistent with previous research on gender inequality in education. Having comparatively lower access to digital devices, girls underperformed boys in our study, highlighting the potential for digital education to bridge the gender gap in education. The results also suggest that being a *Durgam* category school negatively impacted studentsâ remembering, understanding, applying, and analyzing capabilities, highlighting the need for targeted policies and resources to support the development of rural schools, particularly those designated as *Durgam*, to ensure equal access to quality education for all students.

Additionally, our study found that girls from *Sugam* schools with personal digital devices outperformed all others, highlighting the potential for digital education to contribute to better educational outcomes for girls in rural areas. Furthermore, students from lower castes scored less than others, highlighting the need for policies and resources that address inequalities in access to education and resources based on caste and socio-economic status.

In conclusion, our empirical results provide essential insights into the impact of digital devices and other factors on educational outcomes for students in rural areas of India. These findings can inform policies and interventions aimed at addressing the digital divide, gender inequality, and socio-economic inequality in education and ensuring equal opportunities for educational and

socio-economic progress for all students. Our study emphasizes the need for targeted policies and resources to support the development of rural schools, particularly those designated as Durgam, and address the inequalities in access to education and resources based on caste and socio-economic status. Such policies and interventions can ensure equal access to quality education for all students, thus contributing to their overall well-being and socio-economic progress

Table 4 Regression Results

Variables	Bloomscore	Remember	Understand	Apply	Analyze	evaluate	create
Category	0.951	-0.248*	0.564**	-1.030**	1.601***	-0.486	0.550
	(1.773)	(0.148)	(0.267)	(0.460)	(0.473)	(0.519)	(0.665)
Smart class	0.104	-0.195*	0.0949	-0.0570	-0.0569	-0.311	0.629
	(1.239)	(0.104)	(0.187)	(0.321)	(0.331)	(0.363)	(0.464)
Gender	-5.648***	-0.403***	-0.543***	-0.828***	-0.655**	-1.250***	-1.970***
	(1.222)	(0.102)	(0.184)	(0.317)	(0.326)	(0.358)	(0.458)
Acess to Device	2.432**	0.236**	0.198	0.482	0.358	0.615*	0.543
	(1.168)	(0.0978)	(0.176)	(0.303)	(0.312)	(0.342)	(0.438)
Caste	1.478	0.0567	0.501**	0.155	0.536	0.687	-0.458
	(1.678)	(0.140)	(0.253)	(0.435)	(0.448)	(0.492)	(0.629)
Technical issues	-1.596	-0.188	-0.170	-0.675	-0.158	-0.349	-0.0562
	(1.924)	(0.161)	(0.290)	(0.499)	(0.514)	(0.564)	(0.721)
Networkelectricity	6.424***	0.418**	0.988***	1.556***	0.811	1.645***	1.006
	(1.947)	(0.163)	(0.293)	(0.505)	(0.520)	(0.571)	(0.730)
Prior knowledge	-2.557**	-0.245**	-0.578***	-0.530*	-0.460	-0.521	-0.224
	(1.177)	(0.0986)	(0.177)	(0.305)	(0.314)	(0.345)	(0.441)
Relegion	-0.459	-0.0569	-0.211	-0.356	0.181	0.224	-0.241
	(1.859)	(0.156)	(0.280)	(0.482)	(0.496)	(0.545)	(0.697)
Constant	48.37***	2.819***	4.101***	8.745***	8.025***	9.662***	15.01***
	(3.593)	(0.301)	(0.541)	(0.932)	(0.959)	(1.053)	(1.347)
Observations	450	450	450	450	450	450	450
R-squared	0.088	0.079	0.101	0.057	0.090	0.073	0.056

*, ** and *** indicate significance at 10%, 5% and 1% respectively. Standard errors in parentheses

5 Conclusion

Our study provides valuable insights into the impact of digital devices, gender, and socio-economic status on educational outcomes in rural areas of India. Our findings suggest that access to digital devices positively impacts students' critical learning capabilities, highlighting the potential for digital education to contribute to better educational outcomes for students in rural areas. However, the negative impact of network and electricity problems on educational outcomes emphasizes the need for training and support for students to use digital technologies effectively.

Moreover, our study highlights gender inequality in education, as girls scored lower than boys in all components of Bloom's taxonomy. To address this issue, policies and resources should be implemented to provide equal access to quality education for girls in rural areas. Additionally, the lower scores of students from Durgam areas, which have lower connectivity and infrastructure, highlight the need for targeted policies and resources to support the development of rural schools and ensure equal access to quality education for all students.

The government can play a crucial role in addressing these issues by providing infrastructure and resources to improve connectivity, supporting teacher training programs to integrate digital technologies in education effectively, and implementing policies to promote equal access to quality education for all students, regardless of gender or socio-economic status. The government can also prioritize the development of rural schools in Durgam areas, provide incentives for private investment in education, and ensure that resources are effectively allocated to address the digital divide and promote inclusive education.

Our research findings also shed light on the critical need to address the inequalities in the education system based on geographic location, gender, caste, and socio-economic status. The study highlights the negative impact of Durgam category schools on students' cognitive abilities, indicating the urgent need for targeted policies and resources to support the development of schools in rural areas. Additionally, our research reveals the potential of digital education to contribute to better educational outcomes, particularly for girls in rural areas. However, the study also highlights the disparities in access to education and resources based on caste and socio-economic status. This

calls for implementing policies and resources that address these inequalities. Ensuring equal access to quality education for all students, regardless of background or location, is crucial for promoting social and economic development in India. Overall, our study provides important insights into the impact of the digital divide and socio-economic inequality on educational outcomes in rural areas of India. These findings can inform policies and interventions to address these issues and ensure equal opportunities for education and socio-economic progress for all. This study provides important insights that can inform policies and interventions to promote educational and socio-economic progress in rural areas of India. By addressing the issues of gender inequality, the digital divide, and socio-economic inequality in education, we can ensure equal opportunities for all students to reach their full potential and contribute to the country's overall development.

Limitations we acknowledge some limitations that should be considered while interpreting our findings. Firstly, the sample size used in this study was relatively small, which may affect the generalizability of the results. Further research with a larger sample size is necessary to confirm the findings of this study. Secondly, we did not include private schools in our study, which may limit the generalizability of our findings to public schools only. Private schools may have different educational outcomes compared to public schools due to differences in resources and teaching methodologies. Therefore, future research may benefit from including private schools in the study. Thirdly, we did not consider the different social conditions of families while assessing students' academic performance. Social factors such as family income, parental education level, and parental involvement in education can significantly impact students' academic performance. Future research should consider the impact of these social factors on academic performance.

Another limitation of this study is that we used Bloom's Taxonomy as the only measure of academic performance. While it is a widely used framework for assessing cognitive abilities, it may not fully capture other essential aspects of academic performance, such as creativity and critical thinking. Therefore, future research may benefit from using multiple measures of academic performance. This study also did not explore the determinants of digital access, an essential factor

in today's digital age. Future research should investigate the impact of digital access on academic performance and explore the determinants of digital access, such as access to technology and internet connectivity.

Despite these limitations, this study provides valuable insights into the education system's inequalities and the need for policies and resources to address these issues.

Scope for further research there are several avenues for further research on education inequalities in India. One potential area of focus is to conduct a larger-scale study with a more diverse sample size, including private schools, to understand better the factors contributing to educational inequalities in India.

More research on this could also explore the impact of social factors such as family income, parental education level, and parental involvement on student's academic performance and how these factors interact with geographic location and caste. Another potential area of focus is to conduct a more comprehensive assessment of academic performance that includes measures of creativity, critical thinking, and other essential aspects of academic performance. This could provide a more nuanced understanding of students' academic abilities and better inform policies to improve educational outcomes.

further research could investigate the impact of digital access on academic performance and explore the determinants of digital access, such as access to technology and internet connectivity. This could provide insights into how digital education can be leveraged to improve educational outcomes, particularly for students in rural areas.There is ample scope for further research on education inequalities in India, and this study's limitations provide valuable guidance for future research in this area.

References

Banerjee. Rural poverty alleviation. *Annual Review of Economics*, 1:235–261, 1996. 10.1146/annurev.economics.1.1.235.

Rakesh Basant and Gitanjali Sen. Access to higher education in india: An exploration of its antecedents. *Economic and political weekly*, pages 38–45, 2014.

Subrata Ghatak. Ict diffusion and digital divide in india. *Journal of Economic Surveys*, 28(4):697–707, 2014. 10.1111/joes.12051.

Sonalde Desai and Veena Kulkarni. Changing educational inequalities in india in the context of affirmative action. *Demography*, 55(1):259–285, 2018. 10.1007/s13524-017-0646-x.

Nidhi Tewathia, Anant Kamath, and P Vigneswara Ilavarasan. Social inequalities, fundamental inequities, and recurring of the digital divide: Insights from india. *Technology in Society*, 61:101251, 2020.

Ashwini Deshpande and Katherine Newman. Where the disadvantaged may fare better: Education and occupational mobility in rural india. *Journal of Development Studies*, 43(5):864–889, 2007. 10.1080/00220380701203395.

Théophile Muhayimana, Lambert Kwizera, and Marie Rose Nyirahabimana. Using bloomâs taxonomy to evaluate the cognitive levels of primary leaving english exam questions in rwandan schools. *Curriculum Perspectives*, 42(1):51–63, 2022.

Sukhadeo Thorat and Paul Attewell. The legacy of social exclusion: A correspondence study of job discrimination in india. *Economic and Political Weekly*, 40(48):4861–4866, 2005. URL https://www.jstor.org/stable/4417475.

The Right of Children to Free and Compulsory Education Act, 2009. Retrieved on 31 March 2023, 2009.

Mohan G. Rao. Caste, icts, and development in rural india. *Information Technologies and International Development*, 4(2):19–36, 2007. 10.1162/itid.2007.4.2.19.

Ashwini Deshpande and Geetha Joseph. Changing educational inequalities in india in the context of affirmative action. *Demography*, 40(1):135–150, 2003. 10.1353/dem.2003.0007.

Richard E Mayer. Advances in applying the science of learning and instruction to education, 2008.

Paul A Kirschner, John Sweller, and Richard E Clark. Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational psychologist*, 41(2):75–86, 2006.

John Hattie and Gregory CR Yates. *Visible learning and the science of how we learn.* Routledge, 2013.

C Chandramouli and Registrar General. Census of india 2011. *Provisional Population Totals. New Delhi: Government of India*, pages 409–413, 2011.

National Council of Educational Research and Training (NCERT). Alternative academic calendar, 2020. URL https://ncert.nic.in/pdf/AlternativeCalendar.pdf.

India, Oxfam. Status report-government and private schools during covid-19, 2020.

Pradeep Ray. Remote teaching during covid-19: A study of challenges and opportunities for teachers. *Journal of Education for Teaching*, 47(2):251–262, 2021.

Shraddha Vaidya. Assessing the impact of covid-19 on learning outcomes: Evidence from a low-income country. *International Journal of Educational Development*, 84:102372, 2021. https://doi.org/10.1016/j.ijedudev.2021 .102372.

Akshay Sood and Shyam Narayanan. The role of non-governmental organizations during the covid-19 pandemic in india. *Journal of Social and Economic Development*, 22:272–277, 2020. https://doi.org/10.1007/s40847-020 -00126-4.

IMAI (Internet and Mobile Association of India). India internet 2019. https://www.iamai.in/reports/83/ 1091/india-internet-2019, 2020.

World Bank. *World Development Report 2020: Trading for Development in the Age of Global Value Chains.* World Bank, 2020a. URL https://www.worldbank.org/en/publication/wdr2020.

Government of India. Digital india. https://digitalindia.gov, 2015.

Government of India. Bharatnet. https://bharatnet.gov.in/, 2011.

J. P. Singh. Bridging the digital divide in rural india: A literature review. *International Journal of Applied Engineering Research*, 12(14):4403–4410, 2017.

Sandeep Kumar Sharma and Vinod Kumar. Digital divide: Challenges and opportunities in rural india. *International Journal of Advanced Research in Computer Science and Software Engineering*, 6(2):68–72, 2016.

Manish Gupta and Madhu Bala. Community-based approaches for improving access to digital devices in rural areas: A case study. *Journal of Information Technology Management*, 30:13–24, 2019.

World Bank. Digital dividends of mobile money in pakistan and uganda. *World Bank Research Observer*, 35: 29–54, 2020b.

Press Trust of India. Govt to distribute 10 lakh tablets to students in rural areas for online classes: Prakash Javadekar, 2021. URL https://www.indiatoday.in/india/story/govt-to-distribute-10-lakh-tablets-to-students-in-rural-areas\-for-online-classes-prakash-javadekar-1791549-2021-03-04.

MoEI. Digital india, 2021. URL https://www.meity.gov.in/digital-india.

David R Krathwohl. A revision of bloom's taxonomy: An overview. *Theory into practice*, 41(4):212–218, 2002.

Fig. 3 Photos from Field

Consent letter

I _____ principal of _____
_____allowing Shanchhith Singh Nayak(18392) who is a bonafide
fifth-year student in the Economic Sciences Department of the Indian Institute of Science
Education and Research Bhopal, to conduct a survey on class 8 and 9 students for his Postgraduate
research.

The data collected won't have any identifying information; the names of the participants won't be
revealed and cannot be used directly for his research purpose. All the information except for the
name of the participants can be used for research purposes.

All the information collected is for the right use, and the collector would be responsible for securing
and safeguarding the information.

मैं _____ प्रधानाचार्य _____
_____, Shanchhith Singh Nayak(18392), जो भारतीय विज्ञान शिक्षा और
अनुसंधान संस्थान, भोपाल के आर्थिक विज्ञान विभाग में पांचवें वर्ष के एक वास्तविक छात्र है उन्हें अपने
स्नातकोत्तर शोध के लिए कक्षा 8 और 9 के छात्रों पर एक सर्वेक्षण करने की अनुमति देता हूँ।

एकत्र किए गए डेटा में पहचान करने वाली कोई जानकारी नहीं होगी; प्रतिभागियों के नामों का खुलासा नहीं किया
जाएगा और उनके नामों को सीधे उनके शोध उद्देश्य के लिए इस्तेमाल नहीं किया जा सकता है। प्रतिभागियों के
नाम के अलावा सभी सूचनाओं का उपयोग अनुसंधान उद्देश्यों के लिए किया जा सकता है।

एकत्र की गई सभी जानकारी सही उपयोग के लिए है, और Shanchhith Singh Nayak जानकारी को सुरक्षित रखने
के लिए जिम्मेदार होंगे।

Contact details of department and supervisors:
Department: Email address- office_eco@iiserb.ac.in (+91-7552692587)
Supervisors- vipin@iiserb.ac.in (+91-7552692723), sreenath@iiserb.ac.in (+91-7552692707)
Student - Shanchhith18@iiserb.ac.in (+91-8958632218)

Student Signature   principal signature

Date: Date:

General Questionnaire For School Principals and Teachers Respectively.

श्रेणी	सुगम-1/2/3	दुर्गम-1/2/3	अति-दुर्गम-1/2/3
कक्षाओं			
सरकारी/सहायता प्राप्त/निजी			
बोर्ड			
शहरी /ग्रामीण			
केवल लड़के/केवल लड़कियां/सह-शिक्षा			
ज़िला			
ऑल वेदर रोड्स			
प्राप्त पाठ्य पुस्तकें			
मिड डे मील			
कंप्यूटर एडेड लर्निंग			
स्कूल में बिजली कनेक्शन			
स्कूल बिल्डिंग बाउंड्री वॉल			
पुस्तकालय			
खेल का मैदान			
पेयजल प्रकार			
चिकित्सा जांच			
विकलांग अनुकूल रैंप			
निर्देश का माध्यम			

Name	sugam-1/2/3	durgam-1/2/3	at-durgam1/2/3
Classes			
Govt/Aided/Pvt			
Board			
Urban/Rural			
Boys/Girls/Co-ed			
District			
Approachable by All-Weather Roads			
Text Books Received			
Mid-Day Meal			
Computer Aided Learning			
Electricity Connection in School			
School Building Boundary Wall			
Library			
Playground			
Drinking Water Type			
Medical Check-Up			
Disabled Friendly Ramps			
Medium of Instruction			

For Teachers

नाम :
लिंग:
उच्चतम डिग्री:
आयु:

1. क्या आपके पास निजी फोन/डिजिटल डिवाइस है?
   यदि नहीं, तो आप किसका उपयोग करते हैं

   _____

2. महामारी के दौरान डिजिटल उपकरणों का उपयोग करने में आपको किन मुद्दों और चुनौतियों का सामना करना पड़ा?
   तकनीकी/अनुपलब्धता/कोई डेटा नहीं?

   _____

3. क्या डिजिटल डिवाइस तक पहुंच प्राप्त करना आसान था
   _____

4. महामारी के दौरान उत्कृष्ट शिक्षा के लिए आईसीटी के उपयोग के बारे में आपकी क्या धारणा है?
   (सकारात्मक/नकारात्मक/तटस्थ)

   _____

5. आपके विद्यालय में माध्यमिक स्तर पर विद्यार्थियों की शिक्षा पर कोविड-19 का क्या प्रभाव पड़ा है?
   (समान/बढ़ी/घटी/कोई टिप्पणी नहीं)

कक्षा में एकाग्रता	
प्रश्न हल करने की क्षमता	
शिक्षकों के साथ बातचीत	
कक्षा में प्रश्नों का उत्तर देना	
कक्षा में उत्तर लेखन	

For Teachers

Name :
Gender:
Qualification:
Age:

1. Do you have a personal phone/digital device?
    If No, then whose do you use
    _____

2. What issues and challenges in using digital devices confronted you during the pandemic?
    technical/non-availability/no data?

    _____

3. Was it easy to get access to the digital device;
    _____

4. What is your perception of ICT usage for outstanding learning during the pandemic?
    (positive/negative/neutral)

    _____

5. What has been the impact of Covid-19 on the education of students at the secondary level in your
    school? (same/increased/decreased/no comments)

Concentration in class	
Problem-solving capability	
Interaction with teachers	
Answering questions in class	
Answerwriting in class	

Questionare for class 8 and 9 Students (Hindi and English)

नाम:

कक्षा:

लिंग (एम / एफ):

आयु :

जाति:

धर्म:

राशन कार्ड (हाँ/नहीं/बीपीएल/अन्य):

भाई / बहन और जन्म क्रम:

भाई या बहन	बड़े	छोटा
भाई	1/2/3	1/2/3
बहन	1/2/3	1/2/3

1. ऑनलाइन कक्षाओं में भाग लेने के लिए मेरे पास एक निजी उपकरण/मोबाइल तक पहुंच है:
हाँ

_____

ना, फिर किसका?

_____

मोबाइल	लैपटॉप	अन्य

1. किसी भी माता-पिता के लिए शिक्षा का उच्चतम स्तर क्या है? (कोई शिक्षा नहीं / दसवीं पास / बारहवीं पास / स्नातक / अन्य (धार्मिक स्कूल))

माता	
पिता	

2. आपके माता-पिता का पेशा क्या है? व्यापार / सरकार। नौकरी / दैनिक वेतन भोगी / बेरोजगार / निजी / अन्य)

माता	
पिता	

3. ऑनलाइन कक्षाओं में भाग लेने के लिए मेरे पास एक निजी उपकरण/मोबाइल तक पहुंच है:
हाँ

_____

नहीं, तो किसका

_____

मोबाइल फोन	लैपटॉप	अन्य

4. ऑनलाइन कक्षाओं के लिए उपयोग किए जाने वाले उपकरण/मोबाइल के पूर्व ज्ञान का स्तर:
   नील, कुछ ज्ञान, मध्यवर्ती, विशेषज्ञ।
   _____

5. मुझे अपने शिक्षक के साथ जुड़ाव के दौरान डिवाइस की समस्याओं का सामना करना पड़ा।

कभी नहीं	कभी-कभी	हमेशा

6. मैं अपने इलाके में इंटरनेट गुणवत्ता के मुद्दों का सामना करता हूं (इस्तेमाल किया गया उपकरण)

वाई - फाई	मोबाइल डेटा	मॉडम/सरकार

कभी नहीं	कभी-कभी	हमेशा

7. मैं अपने इलाके में बिजली कटौती/लोड शेडिंग का सामना करता हूं (घंटों में)

   _____

8. साथी छात्रों/शिक्षकों के साथ जुड़ने के लिए आपका पसंदीदा मंच कौन सा है?

Google-meet	zoom	अन्य

9. आपके पास किसी भी समय उपयोग के लिए एक निजी उपकरण/मोबाइल है।

   _____

10. क्या आप पहली बार इस प्लेटफॉर्म का उपयोग कर रहे हैं?
    हाँ, क्या आपको किसी कठिनाई का सामना करना पड़ा?
    _____
    नहीं_____

11. घर पर डिजिटल उपकरण

प्रदाता	टेलीविजन	लैपटॉप	मोबाइल फोन	टैबलेट
एनजीओ/एजेंसी				
व्यक्तिगत				

12. मौका मिलने पर आप किस समय ऑनलाइन कक्षाओं में भाग लेना पसंद करेंगे?

सुबह	शाम	अन्य
क्यों?		

_____

13. ऑनलाइन जुड़ाव ने मुझे नई सीखने की आदतों को विकसित करने में सक्षम बनाया है। जैसे ई-बुक्स और ऑनलाइन परीक्षा आदि| आप किस उद्देश्य के लिए डिवाइस का उपयोग करते हैं(अध्ययन/सोशल मीडिया/आदि)

_____

14. ऑनलाइन जुड़ाव ने मुझे अपने डिवाइस/मोबाइल के साथ परिचित/विशेषज्ञता बढ़ाने में सक्षम बनाया है।

सहमत   असहमत   तटस्थ/कोई राय नहीं

15. मैं असाइनमेंट सबमिट करके अपने काम को आसानी से वैयक्तिकृत कर सकता हूं।

सहमत   असहमत   तटस्थ/कोई राय नहीं

16. मैं ऑनलाइन काम करने के दौरान कहीं और डायवर्ट करने के लिए विकर्षण या प्रलोभन से बच सकता हूँ

सहमत   असहमत   तटस्थ/कोई राय नहीं

17. मैं अपने डिवाइस/मोबाइल का इस्तेमाल वर्चुअली (प्लेटफ़ॉर्म) से मेलजोल करने के लिए करता हूं

_____

18. मिड-डे मील नहीं होगा तो क्या आप स्कूल जाएंगे?

_____

19. क्या सरकार आपको किसी भी रूप में स्कूल जाने के लिए सहायता प्रदान करती है (वर्दी/सब्सिडी/डीबीटी)

_____

20. आप अपने खाली समय में क्या करते हैं (खेलना/डिजिटल उपकरण/अंशकालिक नौकरी)

_____

21. स्कूल के बाद क्या करना चाहते हैं? (नौकरी (सरकारी/निजी)/उच्च शिक्षा/पारिवारिक व्यवसाय /अभी तक तय नहीं)

_____

22. घर पर आपकी पढ़ाई में कौन आपकी सहायता करता है

23. महामारी की अवधि के दौरान ऑफ़लाइन कक्षाओं के लिए ऑनलाइन कक्षाएं एक अच्छा विकल्प हैं:

हाँ। क्यों?

_____

ना। क्यों?

_____

24. क्या आपके शिक्षक को किसी कठिनाई का सामना करना पड़ा?

_____

Name:
Class:
Gender (M/F):
Age :
Caste:
Religion:
Ration Card (yes/No/BPL/others):
brother /sister and order of birth:

Sibling	Elder	Younger
Brother	1/2/3	1/2/3
Sister	1/2/3	1/2/3

1. Do you have a smart class in your school?
   If yes, how many times do you go there in a week?

   _____

2. What is the highest level of education for either parent? (No education/X pass/XII
   pass/Graduate/Others(religious schools))

Mother	
Father	

3. What is your parent's occupation? Business/Govt. job/Daily wage
   earner/Unemployed/Private/Others)

Mother	
Father	

4. I have access to a personal device/mobile to attend online classes:
   Yes

   _____

   No, then whose

   _____

mobile	laptop	others

5. Level of prior knowledge of the device/mobile used for online classes:
   Nill, some knowledge, intermediate, expert.

6. I have encountered device problems during engagement with my teacher.

Never	Sometimes	Always

7. I face internet quality issues in my locality(device used)

wifi	Mobile data	modem/government

Never	Sometimes	Always

8. I face electricity outage/load shedding in my locality(in hours)

_____

9. What is your favourite platform for engaging with fellow students/teachers?

Google-meet	zoom	others

10. You possess a personal device/mobile for an engagement at any time.

_____

11. Are you using this platform for the first time?
    Yes, did you face any difficulty?_____
    no _____

12. Digital devices at home

provider	Televisions	Laptops	Mobile phones	Tablets
NGO/Agency				
personal				

13. If given a chance, What time do you prefer to attend online classes?

Morning	Evening	others
why? _____

14. Online engagement has enabled me to cultivate new learning habits, e.g. e-books and online exams. for what device do you use (studying/social media/etc.)

_____

15. Online engagement has enabled me to increase familiarity/expertise with my device/ mobile.

        Agree/   Disagree   Neutral/No-Opinion

16. I can easily personalise my work by submitting assignments

        Agree/   Disagree   Neutral/No-Opinion

17. I can avoid distractions or temptations to divert elsewhere while engaged online

        Agree/   Disagree   Neutral/No-Opinion

18. I use my device/mobile to socialise virtually(platform)

_____

19. Will you go to school if the mid-day meal is not there?

_____

20. Does the government provide you with aid to go to school in any form (uniform/subsidy/DBT)

_____

21. What do you do in your free time(play/digital device/work)

_____

22. What do want to do after school? (job(government/private)/higher education/family business(specify which)/not decided yet)

_____

23. Who assists you in your studies at home

_____

24. Online Classes are a good substitute for offline classes during the pandemic period:
Yes. why?

_____

No. why?

_____

25. Did your teacher face any difficult?

_____

Subject-wise question paper for class 8 students

Maths class 8.

1. 72% of 25 students are good at mathematics. How many are not good at mathematics?

25 छात्रों में से 72% गणित में अच्छे हैं। कितने गणित में अच्छे नहीं हैं?

2. Find the solution of 2x – 3 = 7. 2x – 3 = 7 का हल ज्ञात कीजिए।

3. Find the square of the number 32. संख्या 32 का वर्ग ज्ञात कीजिए।

4. Find the product: a^2(2ab – 5c). गुणनफल ज्ञात कीजिए: a^2(2ab – 5c)

5. Factorize (i) 6xy – 4y + 6 – 9x (ii) $x^2 + xy + 8x + 8yx$.

दिए गए समीकरणों का गुणनखंडन कीजिए (i) 6xy – 4y + 6 – 9x (ii) $x^2 + xy + 8x + 8yx$

6. Write the following numbers in standard form. (i) 0.000000564 (ii) 0.0000021 (iii) 21600000 (iv) 15240000.

निम्नलिखित संख्याओं को मानक रूप में लिखिए। (i) 0.000000564 (ii) 0.0000021 (iii) 21600000 (iv) 15240000।

7. A train is moving at a uniform speed of 75 km/hour. (i) How far will it travel in 20 minutes? (ii) Find the time required to cover a distance of 250 km.

एक रेलगाड़ी 75 किमी/घण्टा की एकसमान चाल से चल रही है। (i) यह 20 मिनट में कितनी दूरी तय करेगी? (ii) 250 किमी की दूरी तय करने में लगने वाला समय ज्ञात कीजिए।

8. 2025 plants are to be planted in a garden in such a way that each row contains as many plants as the number of rows. Find the number of rows and the number of plants in each row.

2025 पौधों को एक बगीचे में इस प्रकार लगाया जाना है कि प्रत्येक पंक्ति में उतने ही पौधे हों जितनी पंक्तियों की संख्या है। पंक्तियों की संख्या और प्रत्येक पंक्ति में पौधों की संख्या ज्ञात कीजिए।

9. Find the smallest square number which is divisible by each of the numbers 6, 9 and 15.

वह सबसे छोटी वर्ग संख्या ज्ञात कीजिए जो प्रत्येक संख्या 6, 9 और 15 से विभाज्य हो।

10. An electric pole, 14 metres high, casts a shadow of 10 metres. Find the height of a tree that casts a shadow of 15 metres under similar conditions.

14 मीटर ऊँचा एक बिजली का खंभा 10 मीटर की छाया बनाता है। समान परिस्थितियों में 15 मीटर की छाया डालने वाले पेड़ की ऊँचाई ज्ञात कीजिए।

Class 8 English

Q1. Read the following passage carefully.

Bruce was a brave king. Once, he had to fight against a large army with just a few soldiers. He was defeated. He had to run for his life. Bruce took shelter in a forest cave. He was very depressed. His courage had left him. He was blankly gazing at the ceiling of the cave. An interesting scene captures his attention. A small spider was trying to weave a web across the cave ceiling. As the spider crawled up, a thread of the web broke, and the spider fell down. But the spider did not give up. He tried to climb again and again. Finally, the spider successfully climbed up and completed the web. Bruce began to think, "If a small spider can face failure so bravely, why should I give up? I will try with all might till I win." This thought gave strength to the defeated king. Bruce got out of the jungle and collected his brave soldiers. He fought against the large army. He was defeated again. But now, he wouldn't give up his fight. Bruce, again and again, fought against the large army. Finally, after many attempts, he defeated the large army and regained his kingdom. Based on your reading of the passage, answer the questions by choosing the correct option.

1. King Bruce was defeated as he had to fight _____

a. Against a few soldiers

b. Against a large army

c. For a large army

d. Against an army of men.

2. Bruce took shelter in a forest cave because

a. He had to worship

b. He had to save his life

c. He was looking for someone

d. He had been on tour

3. What happened as the spider fell down?

a. The Spider continued his practice

b. The Spider went at other place

c. The spider gave it up

d. The spider didn't take interest.

4. What did Bruce do to see the activity of the spider? a. He continued his fight b. He took rest c. He surrendered d. He joined the large army

5. The action of the spider

a) Depressed Bruce

b) Encouraged Bruce

c) Annoyed Bruce

d) Delighted Bruce

6. Write a short paragraph of about 100 words on any of the following topics:- a. Discipline b. Importance of animals c. A visit to a hill station.

7. - You are the monitor of your class. Your class is planning to go on a one-day educational tour. Write an application to your school's principal requesting him to grant permission for the tour.

8. Fill in the blanks in the following sentences using one of the four options from those given below each.

- Rachna is _____ than her sister.

  a. Tall b. taller c. tallest d. more tall

- He is good _____ mathematics.

  a. In b. at c. with d. for

- Birds didn't _____ in the sky.

  a. Flew b. fly c. flying d. flown

- The noun form of "travel" is

  a. Trival b. traveller c. travelled d. Try.

9. Rearrange the following jumbled words to make a meaningful sentence.

a. Person/ a / healthy / exercise / makes.

b. Important / in / life / it / one's / is.

c. Exercises / physical / person / make / physically / fit.

Class 8 SST

1 Who was the first Prime Minister of India?

भारत के प्रथम प्रधानमंत्री कौन थे?

a) Sardar Vallabhbhai Patel

b) J. L Nehru

c) Dr. B. R. Ambdekar

2. Bengal was partitioned in

बंगाल का विभाजन कब हुआ था

a) 1900

b) 1948

c) 1905

3. _____ operate for profit in the market

    _____ बाजार में लाभ के लिए काम करते हैं

a) Government

b) Private Companies

c) Cooperative Societies

4. Article 21 of the constitution guarantees the

संविधान का अनुच्छेद 21 इसकी गारंटी देता है

 a) Right to food

b) Right to a pollution-free environment

c) Right to life

5. What do you mean by gender discrimination? What is the role of literacy in reducing gender discrimination in our society?

लैंगिक भेदभाव से आप क्या समझते हैं? हमारे समाज में लैंगिक भेदभाव को कम करने में साक्षरता की क्या भूमिका है?

6. What is FIR? What is the role of the Judge? Write any two
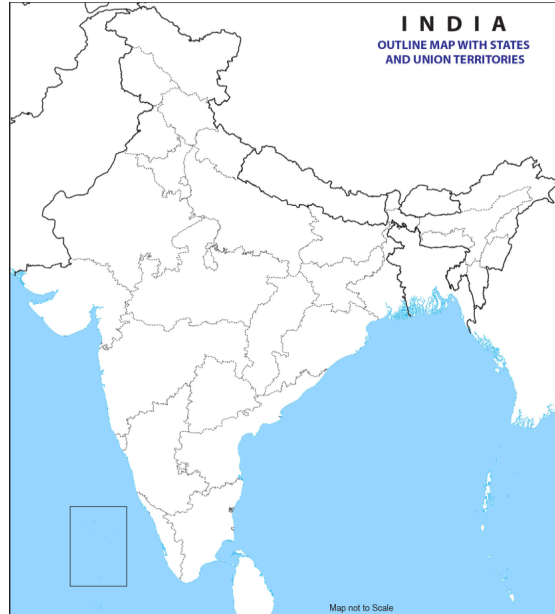
एफआईआर क्या है? जज की क्या भूमिका होती है? कोई दो लिखिए

7. What was the contribution of Ishwar Chandra Vidyasagar in empowering women in India? Write any two

भारत में महिलाओं को सशक्त बनाने में ईश्वर चंद्र विद्यासागर का क्या योगदान था? कोई दो लिखिए

8. Indian map marks any city(Bhopal, Indore etc.) and tea/coffee producing state.

भारतीय मानचित्र किसी भी शहर (भोपाल, इंदौर आदि) और चाय/कॉफी उत्पादक राज्य को चिन्हित करता है।

9. What are the advantages to foreign companies in setting up production in India?

भारत में उत्पादन स्थापित करने में विदेशी कंपनियों को क्या लाभ हैं?

10. Why do you think there are few cases of private water supply in the world? From where does the government get money for public facilities?

आपको क्यों लगता है कि दुनिया में निजी जलापूर्ति के मामले बहुत कम हैं? जनसुविधाओं के लिए सरकार को पैसा कहां से मिलता है?

Class 8 science

1. Why do astronauts appear floating in space?

अंतरिक्ष यात्री अंतरिक्ष में तैरते हुए क्यों दिखाई देते हैं?

2. Write two properties of friction.

घर्षण के दो गुण लिखिए।

3. Define (a) contact force (b) Non-contact force.

परिभाषित करें (ए) संपर्क बल (बी) गैर संपर्क बल।

4. Explain the circumstances leading to acid rain? How acid rain affects us?

अम्लीय वर्षा के लिए उत्तरदायी परिस्थितियों की व्याख्या कीजिए। अम्ल वर्षा हमें कैसे प्रभावित करती है?

5. Draw a labelled sketch of the human eye.

मानव नेत्र का नामांकित चित्र बनाइए।

6. What are antibiotics? What precautions must be taken while taking antibiotics?

एंटीबायोटिक्स क्या हैं? एंटीबायोटिक्स लेते समय क्या सावधानियां बरतनी चाहिए?

7. What are Nobel metals? Give an example.

नोबल धातुएँ क्या हैं? एक उदाहरण दें।

8. What is a constellation? Name two constellations.

नक्षत्र क्या है ? दो नक्षत्रों के नाम लिखिए।

9. Si unit of force.

बल की एसआई इकाई।

10. poisonous gas that has a strong smell of rotten eggs.

जहरीली गैस जिसमें सड़े हुए अंडे की तेज गंध होती है

Subjectwise questionpaper of class 9.

Class 9 Maths

1. Find the probability of an even number when we throw a die.
    जब हम एक पासे को फेंकते हैं तो एक सम संख्या की प्रायिकता ज्ञात कीजिए।

2. The mean of 10, 12, 16, 20, p and 26 is 17. Find the value of p
    10, 12, 16, 20, p और 26 का माध्य 17 है। p का मान ज्ञात कीजिए।

3. If the diagonals of the rhombus are 16 cm and 12 cm, then find its area.
    यदि समचतुर्भुज के विकर्ण 16 सेमी और 12 सेमी हैं, तो इसका क्षेत्रफल ज्ञात कीजिए

4. A well for common people is dug out by a farmer Itwari in a village. How many cubic
    meters of the earth must be dug out to sink a well of 22.5 m deep and 7 m in diameter?
    Also, find the cost of plastering the curved inner surface at Rs 3 per square metre. Write
    a value depicted by the farmer Itwari.
    एक गांव में इतवारी किसान द्वारा आम लोगों के लिए कुआं खोदा जाता है। 22.5 मीटर गहरे और 7
    मीटर व्यास वाले एक कुएं को डुबाने के लिए कितने घन मीटर मिट्टी खोदनी होगी? इसके अलावा, 3
    रुपये प्रति वर्ग मीटर की दर से घुमावदार भीतरी सतह पर प्लास्टर कराने की लागत भी ज्ञात कीजिए।
    किसान इतवारी द्वारा दर्शाया गया मान लिखिए।

5. ABCD is a rectangle, and P, Q, R and S are the midpoints of the sides AB, BC, CD and
    DA, respectively. Show that quadrilateral PQRS is a rhombus
    एबीसीडी एक आयत है, और पी, क्यू, आर और एस क्रमश: एबी, बीसी, सीडी और डीए के मध्य बिंदु हैं।
    दर्शाइए कि चतुर्भुज PQRS एक समचतुर्भुज है

6. Find the mean of the data given below:
    नीचे दिए गए आंकड़ों का माध्य ज्ञात कीजिए:

Marks(अंक)	20	21	22	23	24	25
No.of Students(छात्रो की संख्या)	4	5	3	6	3	7

7. Find the probability of "at least one girl" in a family of two children.
    दो बच्चों वाले परिवार में "कम से कम एक लड़की" होने की प्रायिकता ज्ञात कीजिए।

8. The following table gives the lifetimes of 400 neon lamps:
    निम्न तालिका 400 नियॉन लैंपों का जीवनकाल देती है:
    Represent the given information with the help of a histogram.
    दी गई सूचना को आयतचित्र की सहायता से निरूपित कीजिए।
      i. How many lamps have a lifetime of more the 700 hours?
          कितने लैंप का जीवनकाल 700 घंटे से अधिक है?

| Life Time(In hours) आयु (घंटो मे)	No. of Lamps (लैम्पों की संख्या)
300-400	14
400-500	56
500-600	60
600-700	86
700-800	74
800-900	62
900-1000	48

9. It is stated that ... "Children from age 1 onwards grows taller and heavier till they reach adolescence at a whopping rate of about 2 kg every year for weight and 3 inches for height". Assuming weight as variable „x" and height „y" and „t" as ages in years, if weight at age 2 is 8 kg and height28 inches. Establish a linear relationship between (i) x and t (ii) y and t

यह कहा गया है कि ... "1 वर्ष की आयु से बच्चे लंबे और भारी हो जाते हैं जब तक कि वे किशोरावस्था तक वजन के लिए लगभग 2 किलोग्राम प्रति वर्ष और ऊंचाई के लिए 3 इंच की दर से बढ़ जाते हैं"। वजन को चर 'x' और ऊंचाई 'y' और 't' को उम्र के रूप में वर्षों में मानते हुए, अगर 2 साल की उम्र में वजन 8 किलो और ऊंचाई 28 इंच है। (i) x और t (ii) y और t के बीच एक रैखिक संबंध स्थापित करें

10. The circumference of base of a cone is 220/7 cm and its slant height is 13 cm. Find the volume of cone.

एक शंकु के आधार की परिधि 220/7 सेमी है और इसकी तिरछी ऊंचाई 13 सेमी है। शंकु का आयतन ज्ञात कीजिए।

Class 9 science

1. Why bryophytes are called the amphibian of plant kingdoms?
   ब्रायोफाइट्स को पादप जगत का उभयचर क्यों कहा जाता है?
2. Name the force which acts on an object immersed in a fluid.
   किसी द्रव में डूबी वस्तु पर लगने वाले बल का नाम लिखिए।
3. Calculate the Number of electrons in the Ca2+ ion. (Atomic no of ca=20).
   Ca2 आयन में इलेक्ट्रॉनों की संख्या की गणना करें। (ca की परमाणु संख्या = 20)।
4. "Pisces are adapted to survive in aquatic environment" state four characteristic features of class pieces in support of your answer
   "मीन जलीय वातावरण में जीवित रहने के लिए अनुकूलित हैं" अपने उत्तर के समर्थन में वर्ग के टुकड़ों की चार विशेषताएँ बताएं
5. What is power? Write its S.I unit.
    Power क्या है? इसका S.I मात्रक लिखिए।
6. What is atomicity? Calculate the atomicity of Na2SO4?
   परमाणुता क्या है? Na2SO4 की परमाणुता की गणना करें?
7. Differentiate between acute and chronic disease. Which one of them is more harmful and why?
   तीव्र और जीर्ण रोग के बीच अंतर। इनमें से कौन सा अधिक हानिकारक है और क्यों?
8. Enlist the basic conditions necessary for good health.
   अच्छे स्वास्थ्य के लिए आवश्यक बुनियादी शर्तों को सूचीबद्ध करें।
9. What do you mean by immunization? Why is it important to immunize children? State the immunization programs available at the health centre in your area.
   टीकाकरण से आप क्या समझते हैं ? बच्चों का टीकाकरण क्यों जरूरी है? आपके क्षेत्र में स्वास्थ्य केंद्र में उपलब्ध टीकाकरण कार्यक्रमों के बारे में बताएं।
10. Identify the kingdoms based on the following features. a. Multicellular eukaryotic autotrophic organisms b. Heterotrophic eukaryotic organisms c. Unicellular eukaryotic organism.
    निम्नलिखित विशेषताओं के आधार पर राज्यों की पहचान करें। एक। बहुकोशिकीय यूकैरियोटिक स्वपोषी जीव b. विषमपोषी यूकेरियोटिक जीव C. एककोशिकीय यूकेरियोटिक जीव।

Class 9 SST

1. How was the mountain systems of Himalayas formed?
   हिमालय की पर्वतीय प्रणालियों का निर्माण कैसे हुआ?

2. Why are rivers important for the country's economy?
   देश की अर्थव्यवस्था के लिए नदियाँ क्यों महत्वपूर्ण हैं?

3. Raw material is an example of which type of capital?
   कच्चा माल किस प्रकार की पूँजी का उदाहरण है ?

4. What stand for IMR ?
   आईएमआर के लिए क्या स्टैंड है?

5. Write a brief note on Nazi art of Propaganda.
   प्रचार की नाजी कला पर एक संक्षिप्त टिप्पणी लिखिए।

6. What were the political conditions in Russia when the revolution occurred? Describe briefly.
   क्रांति के समय रूस में राजनीतिक परिस्थितियाँ क्या थीं? संक्षेप में वर्णन कीजिए।

7. Three items 1,2 and 3 are shown in the given outline map of France. Identify these items with the help of following information and write their correct names on the line marked on the map.
   फ्रांस के दिए गए रूपरेखा मानचित्र में तीन आइटम 1,2 और 3 दर्शाए गए हैं। निम्नलिखित जानकारी की सहायता से इन वस्तुओं को पहचानिए और उनके सही नाम चिन्हित रेखा पर लिखिए

   1. A port of France related to Slave trade.
      दास व्यापार से संबंधित फ्रांस का एक बंदरगाह।
   2. The city where Bastille prison was located.
      वह शहर जहाँ बैस्टिल जेल स्थित थी।
   3. Sea located on the south of France.
      समुद्र फ्रांस के दक्षिण में स्थित है।
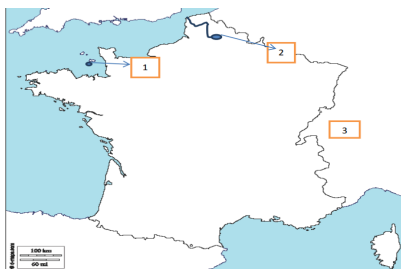
8. Three features, A, B are shown in India's given outline political map.   Identify these features with the help of the following information and write their correct names on the lines marked on the map

भारत के दिए गए रूपरेखा राजनीतिक मानचित्र में तीन विशेषताएं, ए, बी और दिखाई गई हैं। निम्नलिखित सूचनाओं की सहायता से इन लक्षणों को पहचानिए और उनके सही नाम मानचित्र पर अंकित रेखाओं पर लिखिए

A. The highest peak in Western Ghats
   पश्चिमी घाट की सबसे ऊँची चोटी

B. The Indian Desert
भारतीय रेगिस्तान

9. Name the President of the Constituent Assembly
   संविधान सभा के अध्यक्ष का नाम बताइए
10. How many countries are permanent member of the United Nations Security Council?
    संयुक्त राष्ट्र सुरक्षा परिषद के कितने देश स्थायी सदस्य हैं?

Class 9 English

1. You feel that speaking in English is the need of the hour. As your parents are unable to do so, you feel a keen desire to teach them. Write in about 100-120 words a page in your diary expressing how you will execute your plan.
2. Develop a story in about 200-250 words with the following beginning. Also give a suitable title.
3. When India got Independence from the British, most things associated with (a)…………… British were done away with, but some of (b)…………… pretty letter¬boxes managed to survive. These letter-boxes have (c)………. nostalgic aura about them. Some are over 150 years old. Now they all bear the logo of the Indian Postal Services.
   (a) (i) and   (ii) an   (iii) a   (iv) the

(b) (i) an   (ii) the   (iii) but   (iv) an
(c) (i) a   (ii) an   (iii) the   (iv) nor

4. Rearrange the following words or phrases into meaningful sentences:
e.g., bravery/greatness/on one's/depends.
Greatness depends on one's bravery.
(a) is a / whoever / great soul / is / man / brave / of
(b) end of / is to / the / life / true / never / know / ends / that / life.
(c) the fear itself / life / the / we / to fear / only / have / thing / is

5. Read the passage given below and answer the questions/complete the statements that follow:

Chocolate diamonds are actually brown diamonds and compared to the well- known white diamond they aren't much worth. Diamonds are produced in mines. The best known diamond mines are in Australia, South Africa and Russia. The largest diamond mine was discovered in 1976 in the desert of Australia near a little creek named Lake Argyle. Diamonds are created under very extreme conditions of pressure and high temperature. It is a general misunderstanding that there exist only white colourless diamonds. Actually, diamonds exist in many different colours.

Of all the diamond mines in the world, almost 80% of all diamonds produced are brownish in colour. Because they were found in such large quantities compared to the other coloured diamonds, they were considered as low-valued diamonds, only good for the industrial sector. But, a famous man called Le Vian came with a marketing campaign to increase the popularity of the chocolate diamond. Instead of calling it a brown diamond, he gave it popular names like caramel, chocolate, cinnamon and cognac. Since his marketing campaign, chocolate diamonds are becoming very popular.

The value of a diamond is based on its shape, brightness and colour. Because white diamonds are rare, their value is based on the fact that there are not many white diamonds around. But if you look at the shape and brightness, then the brightest diamond in this world known to men is a brown diamond. Before the development of the Argyle Diamond Mine in Australia in 1986, most brown diamonds were considered, worthless for jewellery; they were not even assessed on the diamond colour scale, and were predominantly used for industrial purposes.

However, marketing strategies changed in the 1980s and brown diamonds have become popular gems. The change was mostly due to the supply: the Argyle mine, with its 35 million carats (7,000 kg) of diamonds per year, makes about one third of global production of natural diamonds; 80% of Argyle diamonds are brown. The percentage of brown diamonds is lower in other mines, but it is almost always a significant part of the total production. Consequently, scientific research on causes of brown colour in diamond and ways to alter it has intensified.

(a) The wrong notion about diamonds is that _____.

(b) Brown diamonds were considered low in value because _____ .

(c) Brown diamonds became popular owing to _____ .

(d) The value of a diamond is based on its _____ .

(e) Why are the white diamonds rare?

(f) Name the popular names given to brown diamonds by Le Vian.

(g) Based on shape and brightness, which is the brightest diamond known to the mankind?

(h) Find the word from the passage that means 'a planned set of actions aimed at achieving a particular

6. Read the passage given below and answer the questions that follow:

Su means number and Doku means single. The game of Sudoku has many similarities with the game of life. Sudoku is a puzzle game designed for a single player, much like a crossword puzzle. The puzzle itself is nothing more than a grid of little boxes called "cells". They are stacked nine high and nine wide, making 81 cells total.

The roots of the Sudoku puzzle are in the Switzerland. Leonhard Euler created "carre latin" in the 18th century which is similar to a Sudoku puzzle. The first real Sudoku was published in 1979 and was invented by Howard Gams, an American architect. The real world wide popularity started in Japan in 1986 after it was published and given the name Sudoku by Nikoli.

In life, too, you start with a given set of notions and then work from there on. In Sudoku, you need to follow a set of rules to build up the grid, filling each row, column and box with numbers ranging from one to nine, so much like in life where you have to go on your way without hurting anyone else. Respect every number (person), and things would be fine.While playing, you never think of the end (the result); you just keep working on the numbers and the final result (fruits of action) comes on its own. Extremely difficult puzzles may take hours. Similarly, to achieve desired results in life may take years. The game of Sudoku and the game of life are best played in calm but in a focused state.

Everything has to go together in a Sudoku grid: the rows, columns and squares. Exactly as in life. Your duties towards your family, teachers, society and country all go on simultaneously. In Sudoku, the arrangement of the given numbers is symmetrical. This is instructive in life, on how to maintain steadfast faith, poise and equanimity despite situations when everything turns topsy- turvy.

There is a subtle difference between the two as well. Make a mistake and you can erase it and begin all over again in Sudoku. Not so in life. You can learn a lesson through it, and avoid making the same mistake in future.

(a) What is Sudoku?

(b) How has the writer compared the numbers in Sudoku to life?

(c) What is the similarity between Sudoku and Life?

(d) How do we achieve the desired result?

(e) What is meant by 'instructive '?

(f) What is meant by 'equanimity'?

(g) Find the word opposite in meaning to 'obvious '.

(h) Find the word opposite in meaning to 'ruffled '.