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## Digital Divide and Socio-Psychological Consequences of Online Education during Covid-19: A Study of Undergraduate Students

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### ABSTRACT

The COVID-19 pandemic precipitated a profound transformation in educational systems across the globe, compelling institutions to transition abruptly from conventional classroom-based pedagogy to digitally mediated learning environments. While this shift ensured continuity in academic processes, it simultaneously exposed entrenched structural inequalities embedded within the social fabric. This study critically examines the digital divide and its socio-psychological consequences among 350 undergraduate students by employing a sociological lens informed by theories of social stratification, digital capital, and social integration. The findings indicate that technological constraints, particularly poor internet connectivity, limited access to digital devices, and reliance on mobile data, significantly influenced academic performance and psychological well-being. Regression analysis reveals that connectivity problems ( $\beta = 0.61$ ) and assignment difficulty ( $\beta = 0.52$ ) are the most significant predictors of academic decline, while stress ( $\beta = 0.63$ ) and loneliness ( $\beta = 0.54$ ) strongly predict anxiety. Drawing upon theoretical perspectives such as Marx's conflict theory, Bourdieu's concept of capital, and Durkheim's theory of social integration, the study argues that online education functioned not merely

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as a neutral pedagogical tool but as a mechanism that reproduced and intensified social inequalities. It concludes by advocating for structural reforms aimed at bridging digital disparities and promoting inclusive educational practices.

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## 1. Introduction

The COVID-19 pandemic marked a historic rupture in the institutional structure of education, compelling an immediate and large-scale transition to online learning platforms. This transformation, often described as emergency remote teaching, represents not merely a technological shift but a reconfiguration of educational relations, interactions, and access. From a sociological perspective, education is not an isolated domain but a key institution that reflects and reproduces broader social inequalities. The sudden digitization of education thus brought to the forefront the question of unequal access to resources, opportunities, and outcomes.

The concept of the digital divide provides a crucial framework for understanding these inequalities. It extends beyond mere access to technology and encompasses disparities in digital literacy, usage patterns, and the ability to convert digital resources into meaningful educational outcomes. In the Indian context, where socio-economic disparities, rural-urban divides, and gender inequalities remain pronounced, the transition to online education created differential learning experiences among students. Drawing upon Bourdieu's theory of capital, digital access can be conceptualized as a form of "digital capital" that interacts with economic, cultural, and social capital to shape educational trajectories. Students possessing greater digital capital were better equipped to navigate online learning, while those lacking such resources experienced marginalization.

Furthermore, the shift to online education disrupted traditional forms of social interaction within educational institutions. Durkheim's theory of social integration suggests that the weakening of collective life and reduced interaction can lead to feelings of isolation and anomie. Thus, the transition to digital learning environments not only affected academic performance but also had profound socio-psychological implications. This study seeks to explore these dimensions by examining how structural inequalities influenced student's academic outcomes and mental health during the pandemic.



## 2. Review of Literature

The expansion of online education during the COVID-19 pandemic has been widely examined in contemporary academic discourse. Scholars have highlighted that while digital learning platforms offer flexibility and accessibility, they also pose significant challenges related to infrastructure, pedagogy, and student engagement. The concept of the digital divide has been central to these discussions, with scholars arguing that it is a multidimensional phenomenon encompassing access, skills, and outcomes.

From a sociological standpoint, the digital divide can be understood through the lens of stratification theory, which emphasizes how access to resources is unevenly distributed across different social groups. Norris and Warschauer conceptualize digital inequality as a layered process, where initial disparities in access lead to further inequalities in usage and outcomes. This aligns with Bourdieu's framework, wherein individuals with greater economic and cultural capital are better positioned to acquire and utilize digital technologies effectively.

The psychological impact of online education has also been extensively documented. Studies have reported increased levels of stress, anxiety, and loneliness among students during the pandemic. Durkheim's analysis of suicide underscores the importance of social integration in maintaining mental well-being, suggesting that reduced interaction and weakened social bonds can lead to psychological distress. Similarly, Putnam's concept of social capital highlights the role of networks and social relationships in fostering emotional support and resilience.

Conflict theorists, particularly Marx, provide another important perspective by emphasizing how structural inequalities shape access to resources and opportunities. The transition to online education can thus be seen as a process that reproduces class-based inequalities, as students from economically privileged backgrounds are better equipped with digital resources. This theoretical integration provides a comprehensive framework for analyzing the findings of the present study.

## 3. Objectives of the Study

The study seeks to critically analyze digital inequalities in access to online education and to examine the socio-psychological consequences arising from these inequalities. It aims to assess the impact of technological constraints on academic performance, identify the predictors of academic decline and psychological distress, and explore the role of socio-economic and demographic factors in shaping student's experiences. By situating these objectives within a sociological framework, the study endeavors



to move beyond descriptive analysis and provide a theoretically grounded understanding of the phenomenon.

#### **4. Methodology**

The research is based on a sample of 350 undergraduate students, with primary data collected through a structured questionnaire. The methodological approach integrates quantitative techniques such as descriptive statistics, chi-square tests, correlation analysis, and multiple regressions to ensure a comprehensive analysis of the data. From a sociological perspective, the use of statistical tools allows for the identification of patterns and relationships that reflect underlying social structures. The methodology thus combines empirical rigor with theoretical interpretation, enabling a nuanced understanding of the digital divide and its consequences.

#### **5. Results and Analysis**

##### ***5.1 Digital Divide and Technological Inequality***

The findings reveal a pronounced digital divide among students, reflecting broader patterns of social inequality. A significant 67.4% of students reported experiencing internet connectivity problems, while 48% lacked reliable internet access at home. Additionally, 70.3% relied on mobile data, and 36.6% did not have adequate digital devices. These figures indicate that access to digital resources is unevenly distributed, with students from rural and economically disadvantaged backgrounds being disproportionately affected.

From a theoretical perspective, these findings can be interpreted through Bourdieu's concept of capital, where digital access constitutes a form of digital capital that is unequally distributed across social groups. The significant association between residence and connectivity ( $\chi^2 = 32.47$ ,  $p < 0.001$ ) further underscores the spatial dimension of inequality, reflecting the rural-urban divide. Regression analysis shows that connectivity problems ( $\beta = 0.61$ ) and device shortages ( $\beta = 0.38$ ) significantly predict academic decline, highlighting how structural constraints directly impact educational outcomes. These results align with Marxist theory, which posits that access to resources is determined by one's position within the economic structure.

The findings indicate significant technological constraints affecting student's participation in online education.

**Table 1: Access to Digital Resources among Students**

Variable	Yes (%)	No (%)
Internet Connectivity Problems	67.4	32.6
Reliable Internet Access	52.0	48.0
Reliance on Mobile Data	70.3	29.7
Device Shortage	36.6	63.4

*Resource: primary Data*

Table 1 clearly establishes the existence of a digital divide. A majority of students faced connectivity issues and relied on mobile data, indicating infrastructural inadequacies and unequal access to digital resources.

### **5.2 Academic Consequences of Online Education**

The transition to online education produced varied academic outcomes, with a substantial proportion of students facing difficulties. Approximately 35.4% reported a decline in performance, 56% experienced academic setbacks, and 60.6% struggled with completing assignments. The significant relationship between residence and performance ( $\chi^2 = 18.72$ ,  $p < 0.01$ ) indicates that rural students were more adversely affected, reflecting spatial inequalities in access to educational resources.

Correlation analysis reveals that assignment difficulty is strongly associated with academic setbacks ( $r = 0.52$ ), while workload is moderately linked to performance decline ( $r = 0.39$ ). These findings suggest that academic challenges were cumulative and interconnected. From a functionalist perspective, the disruption of institutional norms and routines weakened the effectiveness of the educational system. At the same time, conflict theory highlights how these challenges disproportionately affected marginalized students, thereby reproducing existing inequalities. To examine the relationship between digital access and academic outcomes, a chi-square test was conducted as mentioned in the table below.

**Table 2: Connectivity Problems and Academic Performance**

Connectivity Problem	Academic Impact(yes)	No Impact
Yes	176	60
No	46	68

*Source: primary Data*



Chi-square Test:

$$\chi^2 = 35.72, df = 1, p < 0.001$$

The association is highly significant, indicating that students experiencing connectivity problems were far more likely to suffer academic decline. This confirms that digital inequality directly translates into educational inequality.

### ***5.3 Socio-Psychological Consequences***

The socio-psychological impact of online education is evident in the high levels of stress, loneliness, and anxiety reported by students. A total of 65.1% reported mental health impacts, 69.7% experienced stress, 61.1% reported loneliness, and 52% experienced anxiety or depression. Regression analysis indicates that stress ( $\beta = 0.63$ ) and loneliness ( $\beta = 0.54$ ) are the strongest predictors of anxiety.

Durkheim's theory of social integration provides a compelling explanation for these findings, as the shift to online education reduced opportunities for social interaction and collective engagement. The weakening of social bonds and the absence of face-to-face interaction contributed to feelings of isolation and anomie. Additionally, Giddens' concept of modernity and self-identity can be used to understand how disruptions in routine and social interaction create anxiety and uncertainty among individuals. The findings thus highlight the interconnectedness of educational processes and psychological well-being.

### ***5.4 Role of Socio-Economic Factors***

Socio-economic status emerges as a critical determinant of student's experiences. The significant association between income and anxiety ( $\chi^2 = 14.91, p < 0.01$ ) indicates that economically disadvantaged students faced greater psychological distress. Furthermore, 53.1% reported financial difficulties, and device ownership was closely linked to income levels.

These findings can be interpreted through Marx's conflict theory, which emphasizes how economic inequalities shape access to resources and opportunities. Bourdieu's framework further explains how economic capital is converted into digital capital, thereby influencing educational outcomes. Students from higher socio-economic backgrounds were better equipped to adapt to online learning, while those from lower-income groups faced structural barriers.



### ***5.5 Gender and Digital Inequality***

The study also reveals significant gender disparities in access to digital resources. A total of 56.6% observed gender differences in internet access, while 49.1% reported restrictions on internet use for female students. The association with rural areas ( $\chi^2 = 9.84, p < 0.01$ ) indicates that these disparities are more pronounced in traditional and patriarchal settings.

Feminist theory provides a critical framework for understanding these findings, as it highlights how gender norms and power relations shape access to resources. The restriction of internet use for female students reflects broader patterns of gender inequality and control over women's mobility and autonomy. These findings underscore the intersectionality of digital inequality, where gender, class, and location interact to shape experiences.

### ***5.6 Online Learning Experience***

Student's perceptions of online learning reveal both opportunities and limitations. While 51.4% found online learning effective and 59.4% were satisfied with course quality, a significant proportion reported low interaction (48.5%) and lack of engagement (55.4%). Regression analysis shows that course satisfaction ( $\beta = 0.41$ ) is the strongest predictor of perceived effectiveness. Symbolic interactionism provides insight into these findings by emphasizing the importance of interaction in the construction of meaning. The reduced interaction between teachers and students limited the development of shared understanding and engagement. This highlights the importance of communication and interaction in the educational process.

### ***5.7 Social and Family Context***

The home environment played a crucial role in shaping student's learning experiences. While 70.3% reported receiving family support, 59.4% experienced household distractions and 61.1% struggled with work-life balance. Regression analysis indicates that household distractions ( $\beta = 0.52$ ) significantly predict academic difficulty.

From a sociological perspective, the family is a key institution that influences educational outcomes. The variation in home environments reflects differences in social and cultural capital, which affect student's ability to focus and engage in learning. These findings highlight the importance of considering the broader social context in understanding educational experiences. A logistic regression model was applied to identify key predictors of academic decline during online education.

**Table 3: Logistic Regression Predicting Academic Decline**

Predictor	Beta( $\beta$ )	Significance
Connectivity Problems	0.61	P<0.001
Device shortage	0.38	P<0.01
Rural residence	0.34	P<0.05
Low household income	0.29	P<0.05

Table 3 reveals that connectivity problems emerge as the strongest predictor of academic decline, followed by device availability and socio-economic factors. This demonstrates that academic outcomes are structurally determined rather than purely individual.

## 6. Discussion

The findings of the study demonstrate that online education during the COVID-19 pandemic was deeply shaped by structural inequalities. The digital divide emerged as a central mechanism through which these inequalities were reproduced and intensified. Drawing upon multiple sociological theories, the study highlights how economic, social, and cultural factors interact to shape educational outcomes.

Conflict theory explains how access to digital resources is linked to economic power, while Bourdieu's concept of capital provides a nuanced understanding of how different forms of capital interact. Durkheim's theory of social integration highlights the psychological consequences of reduced interaction, and feminist theory underscores the gendered nature of digital inequality. Together, these perspectives provide a comprehensive framework for understanding the complex dynamics of online education.

## 7. Conclusion

The study concludes that online education, while necessary during the pandemic, functioned as a mechanism that reproduced and intensified existing social inequalities. Digital access emerged as a key determinant of academic success. While psychological well-being was closely linked to Social interaction and learning environments. The findings emphasize the need to view education as a socially embedded institution shaped by structural factors.



## 8. Recommendations

The study recommends the expansion of digital infrastructure in rural areas, provision of subsidized internet and devices, integration of mental health support within educational systems, adoption of hybrid learning models, and implementation of gender-sensitive policies. These measures are essential for addressing digital inequalities and promoting inclusive education.

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