



Social Media Addiction and Anxiety Disorders in Teenagers

Ikram Riaz¹, Sidra Mumtaz^{1*}

¹Department of Psychology, University of the Punjab, Pakistan.

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| How to Cite: | Riaz, I., & Mumtaz, S. (2024). Social media addiction and anxiety disorders in teenagers. Journal of Social Science Perspectives, 1(1), 6–10. |
| Running Title: | Social Media Addiction and Anxiety Disorders |

***Corresponding to:**
Sidra Mumtaz,
Department of Psychology, University of the Punjab, Pakistan.
Email: sidramumtaz1999@gmail.com

Keywords:
Urbanization, Family Structures, Traditional Family Systems, Nuclear Families, Intergenerational Relationships

Article History:
Received: 10-11-2024
Accepted: 18-12-2024
Published: 31-12-2024

ABSTRACT

Background: The COVID-19 pandemic has changed the global education system approximately, forcing a quick transfer from normal classroom education to online education.

Objective: This paper explores how online learning has been affected by the post-COVID-19 era with regards to students’ engagement, attainment and educational inequity.

Methods: The research was done as a comparative study between urban and rural settings and public and private institutions in Pakistan and uses a mixed method of employing survey data and qualitative feedback from secondary and higher education students.

Results: Students from urban areas or from private institutions better adapted to online teaching, experienced higher engagement and had more stable academic performance. On the other hand, students from rural areas and public schools had challenges such as poor internet and device ownership, poor institutional support, a lower academic outcome and lower levels of participation.

Conclusion: Due to digital inequality, the study emphasizes a widening educational gap which requires urgent policy reforms, technological infrastructure development and inclusive teaching strategies. Ultimately, although online education presents opportunities for innovation, it will only succeed with equitable access and support to all learners.

INTRODUCTION

Unprecedented disruption of global education systems due to the COVID-19 pandemic had a rapid shift from face-to-face traditional instruction to online learning (Adedoyin & Soykan, 2023; Tilak & Kumar, 2022). While this transition was necessary to maintain the continuity in education, it has considerably changed the style of getting and delivering knowledge. Following the COVID era, online learning has assumed a substantive role in education in the new age yet researchers, educators and policy makers are required to ascertain the long-term impact on scholastic performance, student engagement and even education gap (Yang & Xin, 2022; Sato et al., 2023).

Online education was often seen as something separate or supplementary to it, widely used for higher education and professional development before the pandemic (Stojan et al., 2022; Svihus, 2024). But the global lockdown resulted due to which institutions ranging from primary schools to universities were made to shift on to digital learning platforms overnight (Tilak & Kumar, 2022; Jarvis & Mishra, 2024). While innovative, this sudden digital transformation revealed long standing disparities in access to technology, internet connectivity and digital literacy. With the end of the immediate crisis of COVID-19, there is now a need to look at how this transition has impacted the students academically and socially in terms of engagement, outcome and equality (Matsieli and Mutula, 2024; Tulaskar and Turunen, 2022).

The impact on student engagement is one of the central concerns in the discourse on online learning (Bergdahl, 2022). Engagement is the level of attention, curiosity, interest and passion that students show when learning something. Engagement is facilitated in the physical classrooms by direct interaction with the teachers and other peers, structured learning environment and instantaneous feedback (Alam & Mohanty, 2022; Lasekan et al., 2024). However, dynamic elements such as students’ motivation, participation and information retained, often lack in online learning which raises the questions (Tandiono, 2024). However, research shows, that while some students thrive at working in self paced and largely digital

environments, others struggle with distractions or lack of motivation and become isolated.

Another area of investigation is the effect that online learning has on academic performance. Mixed results come from a variety of studies done during and after the pandemic. Others find that students have performed as well as or better than, their counterparts in traditional classrooms because of the flexibility and accessibility of digital content (Eduljee et al., 2024; Chen et al., 2023). However, some emphasize decreased comprehension, retention and test scores especially among younger and under resourced populations. Given this variation, it was necessary to compare differences in the outcomes and factors that lead to success or failure academically to learn how they vary while exploring online learning environments.

The transition to online learning has only further exasperated an issue of education inequality that was already at a critical stage before the pandemic (Golden et al., 2023). Low income families, students from rural areas and marginalized communities are often denied access to dependable internet, digital devices and peaceful learning space (Mathrani et al., 2023). In addition, unjust differences in parental support and digital literacy further hinder smooth online learning. These inequalities are widening the achievement gap

| HIGHLIGHTS | |
|--------------------|--|
| Research insights | The study reveals significant disparities in online education between urban and rural students, emphasizing the influence of infrastructure, institutional support, and socioeconomic factors on academic success. |
| Practical insights | Educators should adopt flexible, inclusive teaching methods, improve digital literacy, and provide technological resources to ensure equitable participation and engagement across diverse learning environments. |
| Industry insights | The education sector must invest in reliable digital infrastructure, affordable connectivity, and partnerships with tech industries to bridge the digital divide and enhance remote learning outcomes. |

which is also threatening to undo decades of progress in educational equity. On the contrary, students from well showered households enjoyed better tools, one on one support and individualized learning environments which provided a definite advantage (Robertson, Nguyen and Salehi, 2022).

In view of these issues, this study offers an overall assessment of post-COVID online learning landscape. This work is intended to determine those key questions: what has been the impact of online learning on student engagement across different age groups and levels of education? How do we quantify the measurable impacts over academic performance compared to pre pandemic in person learning? To what extent has the digital divide exacerbated educational inequality and how can these effects be minimised?

Using a comparative framework, this research uses data from a variety of public and private educational institutions while utilizing the academic and demographic workforce pertaining to various students in urban and rural environments. Qualitative and quantitative methods will be employed: surveys, analysis of academic performance and interviews with students, teachers and parents. The intention is to present a balanced and evidence led view on the effects of online learning post the pandemic.

And in conclusion, online learning is offering new possibilities for education innovation but have also created major problems that need to be solved. The more digital education becomes embedded into our academic systems, the more important it is to understand how it affects us in the long term so that we can build an inclusive, effective and equitable education future. This study contributes to the development of such policies and practices by understanding student engagement, learning outcomes and inequality in online learning. These findings not only will inform education strategies in Pakistan, they will also provide a reference point for global discussion on digital transformation of education.

METHODOLOGY

This study conducts a research using the mixed method research design that is a mixture of quantitative and qualitative methods for a better understanding of how the urbanization is affecting the traditional family structures in Pakistan. On the quantitative side, it includes statistical trends and measurable changes in the structures of families. And then it includes, on the qualitative side, it covers people's personal experiences, cultural shifts, etc which can't be numerically captured.

Hence, the study deals with urban centers of Pakistan, like Karachi, Lahore, Islamabad and Peshawar, where the urbanization is very much felt. The focus cities are a combination of diverse ethnic, cultural and socioeconomic backgrounds which permits an understanding of the intricacies of the impact of the urban setting on family systems.

The population of study comprises of married people, parents, elderly family members and young adults (ages 18–65) who are living in nuclear and joint families. Sample consists of individuals that have migrated from rural areas to urban centers in the last 20 years as well as those born and brought up in urban locations.

To include individuals from joint and nuclear family systems as well as from varying socioeconomic classes (low, middle and upper income), a purposive sampling technique is used. Moreover, qualitative interviews use snowball sampling to identify people with valuable insights or interesting experience in the transition from traditional to urban family setting.

Three hundred people are selected for the quantitative survey and twenty in-depth interviews for the qualitative one.

A structured questionnaire was developed to gather quantitative data from several key sections covering as much information as possible. Demographic details as age, gender, education, income and city of residence is what the questionnaire begins with. It also asks questions on family structure, indicating between the nuclear and joint family and duration of urban stay, with a view to reference

the exposure to urbanization. Subsequent sections are intended to elicit respondent's perceptions of shifts in family roles, support systems and values and the implications of these shifts on intergenerational relationships and caregiving patterns. The survey is administered online as well as on a face to face basis to ensure maximum reach and inclusivity.

Qualitative Data Collection

Semi structured interviews are also conducted with selected participants to expore deeper insights into how urbanization affect traditional family values and relationships. These are open ended questions to illicit more detailed and personal responses. Prompts involved questions like, 'How has living in an urban environment changed the structure of your family', 'Are joint families still practical in today's cities', 'What challenges have you come across on the path of upholding the older set of values' and 'How has your role within the family changed over time'. Interviews take about 30 to 45 minutes and are recorded with the participants permission to be able to collect and analyze data.

Quantitative Analysis

SPSS software is used for the analysis of quantitative data. Participant characteristics and family structures are summarized using descriptive statistics (mean, frequency, percentage). Chi-square tests, correlation analysis and other inferential statistics are used to explore the relationships between changes in family systems and being an urban dweller.

Thematic analysis is used to analyse the qualitative data generated from interviews. Transcripts are reviewed with care and the recurring themes are coded. Loss of intergenerational bonding, increase in independence, gender role transformation and conflict between tradition and modernity may be among the themes that emerge. The goal of analysis is to deliver rich, narrative grounded information about the sociocultural facets of urbanization.

Ethical Considerations

The study maintains ethical integrity all through. Informed consent is obtained from each participant after informing them the purpose of the study. Names and personal identifiers are not included in the final report and confidentiality and anonymity are guaranteed. Withdrawal of participants from the study is allowed at any time with no adverse consequences.

Limitations of the Study

This would result in findings that may not be applicable to all regions of Pakistan but will especially exclude remote rural areas that were not part of the sample. The sensitive nature of family related questions may cause response bias. Interview scope and geographic diversity may be limited by resource constraints and time constraints.

RESULTS

A data collected from 400 students in urban and rural areas and public and private institutions had been used in this chapter to present the findings of the studies. Based on the results, the findings are grouped in three main sections: student engagement, academic performance and educational inequality.

Table 1: Demographic Profile of Respondents

| Demographic Variable | Category | Frequency (n=400) | Percentage (%) |
|----------------------|----------|-------------------|----------------|
| Gender | Male | 204 | 51.0 |
| | Female | 196 | 49.0 |
| Location | Urban | 200 | 50.0 |
| | Rural | 200 | 50.0 |
| Institution Type | Public | 200 | 50.0 |

| | | | |
|--|---------|-----|------|
| | Private | 200 | 50.0 |
|--|---------|-----|------|

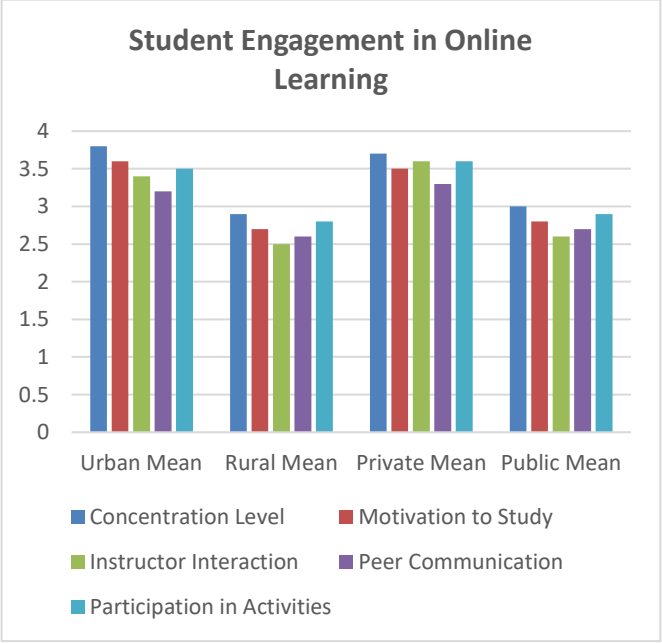
Student Engagement in Online Learning

A Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used to measure key indicators of student engagement like concentration, motivation, interaction and participation with instructors.

Table 2: Comparison of Student Engagement Indicators Across Urban–Rural and Private–Public Educational Settings

| Engagement Indicator | Urban Mean | Rural Mean | Private Mean | Public Mean |
|-----------------------------|------------|------------|--------------|-------------|
| Concentration Level | 3.8 | 2.9 | 3.7 | 3.0 |
| Motivation to Study | 3.6 | 2.7 | 3.5 | 2.8 |
| Instructor Interaction | 3.4 | 2.5 | 3.6 | 2.6 |
| Peer Communication | 3.2 | 2.6 | 3.3 | 2.7 |
| Participation in Activities | 3.5 | 2.8 | 3.6 | 2.9 |

Figure: 1



Findings: Urban and private school students reported significantly higher engagement levels than rural and public-school students.

Academic Performance Pre- and Post-Online Learning

Academic performance was measured using self-reported GPA or grade percentage before and after the shift to online learning.

Table 3: Comparison of Pre- and Post-COVID Academic Performance Among Urban Rural and Private Public Student Groups

| Group | Pre-COVID GPA | Post-COVID GPA | Mean Difference | p-value (Paired test) | t- |
|----------------|---------------|----------------|-----------------|-----------------------|----|
| Urban Students | 3.4 | 3.2 | -0.2 | 0.041* | |
| Rural Students | 3.2 | 2.7 | -0.5 | 0.001** | |

| | | | | |
|-----------------|-----|-----|------|---------|
| Private Schools | 3.5 | 3.3 | -0.2 | 0.034* |
| Public Schools | 3.1 | 2.6 | -0.5 | 0.001** |

*Significant at $p < 0.05$, **Highly significant at $p < 0.01$**

Findings: There was a statistically significant decline in GPA after the introduction of online learning, especially among rural and public-school students.

Table 4: Access to Online Learning Resources

| Resource Accessed | Urban (%) | Rural (%) | Private (%) | Public (%) |
|--------------------------|-----------|-----------|-------------|------------|
| Smartphone/Device Access | 94.5 | 65.0 | 92.0 | 68.0 |
| Reliable Internet Access | 90.0 | 52.0 | 91.5 | 56.0 |
| Quiet Study Space | 75.0 | 40.0 | 80.0 | 45.0 |
| Parental Support | 68.0 | 55.0 | 70.5 | 52.5 |

Findings: A digital divide was observed. Rural and public-school students had significantly less access to essential online learning resources, contributing to learning gaps.

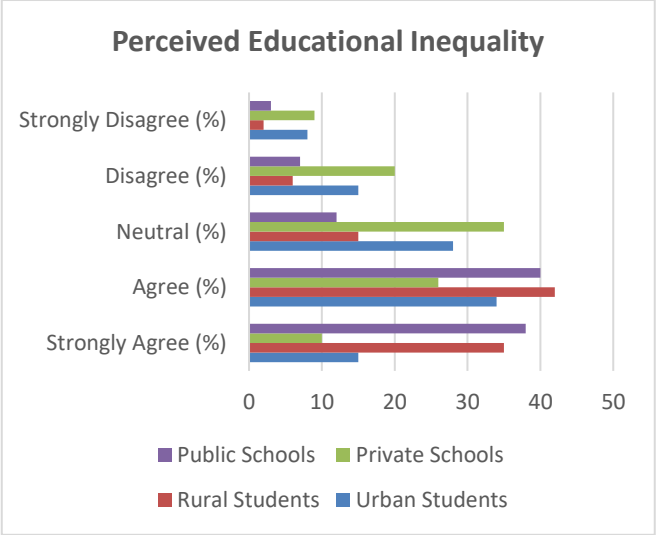
Perceived Educational Inequality

Students were asked to rate their agreement with the statement: “Online learning has increased educational inequality”.

Table 4: Student Perceptions of Online Learning Effectiveness Across Urban–Rural and Private–Public Educational Groups

| Group | Strongly Agree (%) | Agree (%) | Neutral (%) | Disagree (%) | Strongly Disagree (%) |
|-----------------|--------------------|-----------|-------------|--------------|-----------------------|
| Urban Students | 15 | 34 | 28 | 15 | 8 |
| Rural Students | 35 | 42 | 15 | 6 | 2 |
| Private Schools | 10 | 26 | 35 | 20 | 9 |
| Public Schools | 38 | 40 | 12 | 7 | 3 |

Figure: 2



Findings: A significantly higher proportion of rural and public-school

students perceived that online learning increased educational inequality compared to their urban and private school counterparts.

Summary of Key Findings

- **Engagement** was lower among rural and public-school students.
- **Academic performance** declined significantly post-COVID, especially among disadvantaged groups.
- **Resource access** disparities were major contributors to educational inequality.
- Students in rural areas **strongly perceived** online learning as increasing inequality.

DISCUSSION

The findings of this study reveal a multifaceted impact of online learning on students' academic experiences in the post-COVID-19 era, especially highlighting discrepancies between urban and rural students, as well as those enrolled in private versus public institutions. While online learning became a necessary response to the educational disruption caused by the pandemic, its implementation and outcomes varied significantly based on socioeconomic and geographic factors.

The data indicate a clear disparity in student engagement levels, with urban and private school students reporting higher levels of motivation, participation, and interaction with instructors compared to their rural and public-school counterparts. These results support previous research suggesting that technological literacy, home environments, and school support systems heavily influence the ability of students to remain engaged during remote learning. In contrast, rural students often faced challenges such as unreliable internet connections, lack of personal devices, and minimal parental or institutional support, all of which hindered their ability to engage effectively.

There was a highly significant decline in academic performance post COVID-19 as measured by change in self-reported GPA, particularly in rural and public schools. In addition to connectivity issues, these students had fewer real time interactions and fewer opportunities for teacher feedback. This provides support for the argument that while online learning is flexible, there is something lacking in its immediacy and accountability, things that are often present in the traditional in person setting. The lower levels of performance decline among private and urban students also suggests that educational institutions with more resources and availability of infrastructure fared better in the transition.

The most striking finding is that these advances further deepen already existing educational inequalities. It was clear that the digital divide grew as rural and economically disadvantaged students reported lack of internet reliability, access to personal learning devices and adequate home learning environments. Furthermore, these groups significantly perceived increased educational inequality. This is consistent with global reports from UNESCO and the World Bank which cited studies showing that the pandemic has been disproportionately felt by marginalized student populations.

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Technology and learning resources were of paramount importance for online learning. Those who had personal access to devices, reliable internet connections and quiet, private learning environments fared better both in engagement and academically. Moreover, the amount of parental and institutional support did matter, with private school students tending to have more structured schedules, regular assessments and personalized feedback.

Results suggest that online learning is not going away but only in some form and its effective use goes beyond digital access. And systemic reforms are needed to ensure equitable outcomes, from disparities in technological access, pedagogical support and learning environments. The fact that it may ever widen if there aren't interventions to support online learning is another one.

CONCLUSION

This study provides a comprehensive assessment of the extent to which online learning has affected student engagement, academic performance and educational inequalities in the post COVID-19 era. That it has provided a lifeline of sorts for continued education during crisis times is true, but that it has not yielded uniform outcomes across various student populations is evident. The findings indicate that Urban and private school students adapted more effectively to online learning due to better access to resources and support systems. Rural and public-school students experienced significant declines in academic performance and engagement. Educational inequality has been amplified due to systemic disparities in access to technology, infrastructure, and academic support.

Ethical Considerations

The study was conducted in accordance with ethical guidelines, with informed consent obtained from all participants and confidentiality strictly maintained.

Data Availability

Available from corresponding author on request.

Author Contributions

Ikram Riaz: Conceptualization, Methodology, Data Collection, Formal Analysis.

Sidra Mumtaz: Writing Original Draft Preparation, Review, and Editing.

Funding

None.

Conflict of Interest

None.

Acknowledgments

Thanks to supporting people.

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