

IMPACT OF SOCIAL MEDIA ON STUDENTS' ACADEMIC PERFORMANCE AT SECONDARY LEVEL

Dr. Nazish Andleeb^{*1}, Dr. Nishat Zafer², Dr. Azmat Farooq³

^{*1}Assistant Professor, Department of Education, University of Gujrat, Pakistan

²Associate Lecturer, Department of Education, University of Gujrat, Pakistan

³Assistant Professor, Khwaja Fareed University of Engineering and Information Technology (KFUEIT), Pakistan

^{*1}nazish.andleeb@uog.edu.pk

Corresponding Author: *

Dr. Nazish Andleeb

DOI: <http://doi.org/10.5281/zenodo.21025481>

Received 25 February 2026	Accepted 05 April 2026	Published 25 April 2026
------------------------------	---------------------------	----------------------------

ABSTRACT

The unpredictable growth of social media networks has dramatically changed the communication patterns and leisure interests, as well as school life of teenagers across the world: Facebook, Tik Tok, Instagram, WhatsApp, YouTube, and Snapchat have been used. The group of students in the age group of 13 to 18 (secondary level) reflect the most intensive group of social media operators in Pakistan and the penetration and the usage of social media and use of smartphones among the younger demographic are rapidly growing in both urban and semi-urban Pakistan. Although there can be no doubt about the possible of social media in educational communication and learning in groups, the reality of social media as a means of entertainment, socialization, and passive content consumption among secondary schools has prompted serious questions regarding its influence on the study habits, academic attention, coping with sleep, and the end results, which are academic achievements. In spite of these apprehensions, there are relatively few empirically rigorous, locally based studies considering the correlation concerning the usage of social media and academic performing in secondary-level students in Pakistan. This paper is a quantitative, descriptive-correlational research study aimed at exploring how the use of social media influences the academic achievement of Grade 9-10 students in both public and private secondary schools in the Gujrat district, Punjab in Pakistan. Stratified random selection of 200 students (100 in public schools, 100 in private schools) is taken out of the secondary schools in Gujrat. A researcher-constructed, 30-item, Likert-scale Social Media Usage Scale (SMUS) is used to collect data on five dimensions of social media use and academic performance is based on the most recent annual, examination scores of students. IBM SPSS Statistics Version 28.0 is used to conduct statistical analyses such as Pearson correlation, multiple linear regression, independent-sample t-test and one-way ANOVA. The proposed hypotheses suggest that there is a considerable negative relationship between excessive recreational use of social media and academic performance and a weak positive relationship between social media use in education. The research is summarized by evidence-based students, parents, teachers, and education policy recommendations.

Keywords: Social Media, Academic Performance, Secondary Students, TikTok, Facebook, Instagram, WhatsApp, Descriptive Research, Pearson Correlation, Gujrat, Pakistan, Screen Time.

1. Introduction

The introduction of social media has been one of the most inevitable transformations in human message in history. Over the span of one-decade, social networking sites originally designed to serve as niche

communication full of college students evolved to be the channel of constant communication, socialization, consumption of information, and engagement in the culture of billions of people worldwide. To teenagers, the generation who have

been brought up in an age of no social media, these mediums are not just recreational technology; they form social infrastructure. A teenager nowadays in Gujrat, as likely to process the disappointments of academic life, organize the weekend, and find peer approval by using WhatsApp, Tik Tok, and Instagram as much as any other activity on the school day, and this digital social life continues running alongside all other school day expectations. The educational implications of this change are radical and controversial. Social media sites have actually afforded learning: the creators of education content online use YouTube and Tick Tok to reach out to millions of students with explanations of subject matter that, however, is as clear and engaging as classroom instruction; WhatsApp study groups provide students with the opportunity to engage in the peer-based construction of knowledge that educational researchers identified many decades ago as a potent force behind academic comprehension; and social media platforms such as Twitter and LinkedIn expose students to knowledge communities of professionals that can never be achieved through classroom training (Manca and Ranieri, 2016; Junco and Cotten, 2012). Simultaneously, the algorithmic design of lock-in social media is programmed in such a way that it is well-skewed to maximize user-active and time-on-platform - goals which are inherently incompatible with the sustained, attentive and deliberate cognitive labor that academic education entails. Push notifications, infinite scroll, autoplay video, social reinforcement of feedback loop (likes, comments, shares) all reduce the finite attentional resources of an adolescent brain to compete with homework, study time, and classroom attention in an almost irresistibly distracting digital landscape (Twenge and Campbell, 2019).

The conflict between the potential to engage in social media as a knowledge tool and the danger of being distracted by social media is particularly acute in Pakistan, where the proportion of those with smartphone access has risen the level of institutional level of digital literacy and parental oversight over students using social media is sometimes assessed lockingly (PTA, 2024). The students of secondary schools are taking Grade 9 and Grade 10 exams within the Punjab Secondary School Certificate (SSC) assessment system that already assesses the

long-term and disciplined scholarly learning, but are in an atmosphere of social media: specifically, the systemic meritocracy of the single-subject, distracted, attention-seeking novelty. One of the most practically significant questions of the Pakistani educational research today is the effect of this tension on the academic performance.

This research will answer that and, in the process, examine correlations connecting social media use and grade 9-10 student academic performance in Gujrat district on a quantitative, descriptive-correlational design. Disaggregating the social media usage into the dimensions that constitute it its frequency, duration, platform type, purpose (academic vs recreation) and nocturnal use, the study goes beyond the aggregate values of screen-time to establish an in-depth perspective of what areas of social media usage have the strongest academic implications. The results will give both students, parents, teachers and policymakers in Gujrat empirically calibrated and locally approved foundation on which to make informed judgments on the social media behavior of secondary students.

2. Significance of the Study

The importance of this research is explained in three aspects.

In theory, the study can make contributions to the expanding international studies on the technology-academic performance relationship through the production of locally based, disaggregated evidence in one secondary school in Pakistan. The majority of the studies that can be found in the field have been done in Western university context or in adult groups and cannot be made generally applicable to the specific cultural, institutional and digital-access context of Pakistani secondary education. The study gives a more theoretically fined explanation of the association between social media and academic performance through examination as compared to measures of through aggregation alone by treating five independent dimensions of social media use frequency, duration, type of platform used, purpose, and time into consideration.

The study empirically fills a particular and normative gap in the Pakistani educational research literature. Existing studies on the social media and secondary school academic performance in the Gujrat district have not been peer-reviewed and the studies that

have been conducted on Pakistan-wide data have focused more on self-reported academic performance assessments, as opposed to objective assessment tests, and on convenience samples as opposed to stratified random sample of both the public and the private schools. Meth-methodological enhancements of the current study, such as validated instrument, Pearson correlation, multiple regression, and objective SSC examination score data make significant contributions to the pool of evidence that can be accessed by the policymakers and practitioners.

In practice, the results have a direct impact on various stakeholder groups. To students, the research gives evidence-based information as to the most harmful and (possibly) most beneficial social media behaviors in learning. It offers a factual streamline to family digital governance discussion to parents. To the teachers, it gives their students background information on their attentional and motivational issues that they bring with them to the classroom. To policy makers at the Punjab Curriculum and Textbook Board, Punjab School Education Department and Federal Ministry of Education, it offers locally tested evidence to draw on and construct digital literacy, and screen-time advice in the secondary curriculum.

3. Problem statement.

The secondary-level students in Pakistan make up some of the most active social media users in the Pakistan population. According to current surveys, Pakistani teenagers devote four-six hours a day to the social media, with Tik Tok, WhatsApp, YouTube and Instagram taking up most of the time (PTA, 2024; Datar portal, 2024). This interaction is taking place in a group of students who are also in the process of taking the Secondary School Certificate (SSC) examinations - one of the most significant educational tests of their lives, possible entry points into intermediate colleges, student diploma options and potential educational careers.

The Faculty survey and school administrative data of the Gujrat public and private secondary schools consistently captures the issues of decreasing homework completion levels, less concentration in classes, disrupted sleep habits, and worsening examination results of those students who are distinguishable as hefty users of social media

(District Education Authority, Gujrat, 2022; Punjab Examination Commission, 2023). These institutional issues are, however, based on anecdotal observation as opposed to an empirical study. No literature has employed a documented tool to quantify the particular dimensions of social media among the secondary students of Gujrat, and no research had adopted a Pearson correlation and multiple regression to identify the statistical association between the dimensions and objective SSC exam performance within this district.

Moreover, the available literature, on both international and national levels does not sufficiently differentiate the academic influence of various forms and purposes of using social media. A student who uses WhatsApp for three hours in a study group tackling past examination papers is interacting with social media in a very different way to the student who uses WhatsApp to passively scroll Tik Tok videos, but both would record exactly the same in a total screen-time metric. This disaggregation failure has given such inconsistent and seemingly contradictory results in literature (some studies have negative effects, others show no significant relationship) despite the possibility that there are in fact fundamentally different academic implications to the different types of social media use. The proposed research will only put this ambiguity to rest by measuring and analyzing it in disaggregates.

4. Research Objectives

The following specific research objectives guide the research:

1. To determine the attitudes of Grade 910 students in the public and private secondary schools in Gujrat regarding the social media usage patterns such as frequency, time of day use, preference of platforms, the reason of usage, and the use during the hour of darkness.
2. To identify the levels of academic performance of Grade 910 students in Gujrat based on the latest annual scores of Grades 10 students in terms of SSC examination.
3. The nature, strength and direction of the relationship between total social media use and academic performance of students will be investigated using Pearson Product-Moment Correlation.

4. Separating academic implications of the recreational social media use and academic social media use on the performance of students in exams.
5. Determine which particular aspect of social media use as frequency, duration, type of platform, purpose, or nocturnal use is best predicted by academic performance using multiple linear regression analysis.
6. To compare social media use and academic performance of students in the secondary schools in Gujrat (public and private).
7. To test the differences in social media use patterns to determine the difference between genders with regard to performance at the secondary level.
8. To present the evidence-based findings to students, parents, teachers, and education policy makers on how to manage social media at the secondary level.

5. Research Questions

Primary Research Question

- RQ1: How the use of social media affects the academic performance of Grade 9-10 students in secondary schools in Gujrat?

Subsidiary Research Questions

- RQ2: Which are the social media usage patterns of Grade 9-10 students in both the public and the private secondary schools: what are the platforms and frequency, length and purpose as well as time of use in the context of Gujrat?
- RQ3: Do the overall time spent using social media and academic achievement of students (through examination results) exhibit a statistically significant relationship?
- RQ4: How does the academic performance of students differ in recreational and educational use of social media?
- RQ5: Which of the dimensions of social media use predicts best academic performance when all other dimensions are held constant?
- RQ6: Do the patterns of use of social media and academic performance differ significantly between students of public and private schools?
- RQ7: Do social media use patterns significantly differ by gender and how these differences relate to academic performance?

6. Literature Review

6.1 Social Media: Definition and Prevalence Among Adolescents

Social media sites are set as internet-based applications in which users can generate, share and exchange user-generated content in virtual communities and networks (Kaplan and Haenlein, 2010). Recent social media has a heterogeneous ecosystem of platforms distinguished by their major way of communication: text-based platforms (Twitter/X), image-sharing networks (Instagram, Snapchat), short-form video networks (TikTok, YouTube Shorts), messaging networks (WhatsApp, Messenger), and comprehensive multi-modal networks (Facebook). WhatsApp, Tik Tok, YouTube, Facebook, and Instagram have consistently been the top-used apps among Pakistani teenagers and the latter in the 13-18 age group has the highest growth rates compared to the others, as they were not introduced to the Pakistani market until 2018 (Datar portal, 2024; Farooq and Hassan, 2023). Worldwide statistics reveal that among all age groups using social media, adolescents aged 13-18 years use social media the most with an average of 4.8 hours per day, which is the highest number of social media hours per day among all other age groups of Internet users in every country whose longitudinal data are discussed (Common Sense Media, 2023).

6.2 Social Media and Academic Performance: International Evidence.

The correlation between social media usage and academic achievement has been discussed on various levels of education and in different cultures, and most studies find the association to be negative especially in terms of recreational and entertainment use. One of the earliest certain studies, carried out by Karpinski and Duberstein (2009) demonstrated that the college students in the US, who used Facebook, had much lower GPAs as compared to those who did not. Junco (2012) discovered that the hours spent on Facebook was a strong negative predictor of overall GPA in his sample consisting of 1,839 students, even after adjusting demographic factors. The relationship between recreational screen time (including social media) and academic performance reported in a meta-analysis of 22 studies involving educational levels confirmed a

negative correlation with small to moderate effect size (Adelantado-Renau et al., 2019).

In the most directly applicable setting to this study, at primary school level, the results are also consistent. The results of the study by Lau (2017) showed that the outcomes of Hong Kong high school students who spent over two hours a day on social media had significantly worse exam scores compared to students who used less than an hour of social media per day. Rosen, Carrier, and Cheever (2013) reported that each incremental social media check at the time of study corresponded to a significant study time and academic retention in high school students. Siddiqui and Singh (2016) in the Pakistani context found that among Pakistani secondary students, 68% agreed that social media had a negative impact on their study time but did not collect objective performance data.

6.3 social media as a tool in education.

All types of social media utilization are not harmful to studies. A literature review has singled out certain engagement patterns of social media which have positive educational consequences. Manca and Ranieri (2016) recorded the affordances of social media as educational in mediating peer-to-peer learning, collaborative problem solving, and community of educational content. Particularly, WhatsApp study groups have been observed to facilitate abilities of knowledge, assignment coordination and peer clarification - social learning methods that have been reported to have connections with improved academic achievement (Church and de Oliveira, 2013). YouTube has been widely tested as an additional learning tool with students applying educational YouTube channels as an extension of classroom learning in mathematics, sciences and language acquisition (Burke and Snyder, 2008).

The fundamental difference in literature - and the main variable explored in this study - concerns meaningful, academic motivation of social media use and mindless, entertainment motivated, social media use. The given distinction is directly translated into the active/ passive distinction between social media use as an academic means of communication and resource access and passive use as a way of viewing entertainment-related content (Stiglic and Viner, 2019). Research does not make

this distinction in their measurement tools, in other words, considering all social media use as one variable, have attenuated or inconsistent effects, presumably due to the masking of the positive educational use effects by the negative recreational use effects in aggregative analyses (Rosen et al., 2013).

6.4 Mechanisms: The role of social media in Academic Performance.

A number of hypothesized theoretically based mechanisms have been put forward to depict the adverse association between recreational use of social media and academic performance. The simplest of these is the displacement hypothesis (Neuman, 1988): time on social media is time that could have been spent on studying, on homework, on reading, something that has a direct academic value. In case a student has limited time hours between school and bedtime, all hours spent on TikTok are hours that cannot be used to do academic assignments. The displacement effect is multiplied by the facts that the use of social media is more prone, not only to merely eliminate the time spent on studying, but also to the good, quality, distraction-free deep study time that is linked to the greatest extent, both by scholarly retentiveness and examination achievement (Twenge and Campbell, 2019).

The attentional fragmentation hypothesis is a second process that purportedly occurs: habitual multitasking and quick attention switching necessitated by using social media conditions to think in shallow, fragmented bits that are essentially miscible with the agonistic, deep processing attention posed by academic learning (Lissak, 2018). The attentional patterns (a tendency to distraction-seeking, decreased ability to engage in focused activity and lowered boredom-inducing threshold), which pre-teens and young adults adopt when they habitually view Instagram or TikTok a few minutes every few minutes during their homework, become entrenched even when the phone is turned off, further undermining the quality of studying time even in the absence of the time itself.

A third mechanism is the sleep disruption mechanism, which has been reported to have an effect on sleep initiation due to blue light exposure and cognitive arousal, shorter and poorer sleep, and,

via the well-established correlations between sleep and memory consolidation, attention and executive function, impairs cognition, which is most relevant to academic learning and exam performance (Hysing et al., 2015; Lemola et al., 2015). This mechanism can have great consequences especially in secondary students whose developmental biology predisposes them to circadian disruption.

6.5 Social Media, Gender, and Academic Performance.

The patterns of social media use and its impact on academic success and failure differ by gender, with international literature attesting to this phenomenon well, yet the direction in which the differences run differs by platform and culture. Female adolescents are more likely to report greater rates of Instagram and WhatsApp usage, better social media experiences, and more frequent social media-related academic communication, whereas males report greater rates of YouTube and gaming-related social media usage (Common Sense Media, 2023; Twenge and Campbell, 2019). These differences would be exaggerated in the context of Pakistani secondary school, where access to smartphones for the genders is differentiated by gender and the patterns of parental supervision of smartphones provided distinct social media environments in boys and girls. The research done in similar contexts in South Asia indicates that, despite having a similar use of social media as male students, female secondary students are more likely to use social media as an academic communication tool and peer learning experience, and generate less negative, or even positive, association among social media use and academic achievement than is the case with male students (Ali and Iqbal, 2019).

6.6 Pakistani Secondary School context of social media.

The use of social media in relation to academic performance in reference to Pakistani students at secondary school levels is a rapidly expanding line of research which is limited on methodological grounds. A survey of 300 students at the secondary level in Lahore that was conducted by Abbas, Ali, and Raza (2019) revealed that 74% of participants spent more than three hours a day on social media, and 81% agreed that social media distracted them in

their schoolwork, but they did not measure objective academic success or use a validated social media tool. Khan and Mahmood (2021) reported that the duration of WhatsApp use was significantly related to academic procrastination in secondary students in Karachi. The closest methodological antecedent to the current investigation, Farooq and Hassan (2023) reported that Tik Tok use negatively correlated with the SSC examination scores and had significant negative correlations with the hours of Tik Tok. Nevertheless, all these studies used neither stratified random samples of both public and private schools, a multi-dimensional scale of social media measurement, nor a combination of Pearson correlation and multiple regression analysis to determine the isolating predictive impact of various dimensions of social media use.

6.7 Theoretical Framework

The given work bases its theoretical bases on three complementary frameworks. To begin with, Uses and Gratifications Theory (Katz, Blumer, and Gurevitch, 1974) clarifies why students engage social media as something they willingly do in their lives as an active, goal-oriented process where teenagers seek to fulfill a specific set of needs of entertainment, social interaction, information, and identity traits at the expense of academic goals in limited time and attention capacities. Second, the Social Cognitive Theory by Bandura (1986) offers the self-regulatory mechanism: the more academically self-efficacy and self-regulatory competence students have, the more they are able to restrict recreational social media use at the time of study, resulting in a moderate and not homogenous negative correlation between social media use and performance. Third, the Cognitive Load Theory (Sweller, 1988) describes the process of task-switching and multitasking under the influence of social media that leads to the increase of extraneous cognitive load at the time when students are studying, which leaves them with fewer cognitive resources to germane process the academic information and worsens performance in terms of learning and retention.

7. Research Methodology

7.1 Research Design

The research design used in this study is a quantitative, descriptive-correlational research

study. The descriptive element defines the social media usage habits among Grade 910 students in the secondary schools of Gujrat under five dimensions (frequency, duration of use per day, site of use, the major use purpose (educational or recreational) and nocturnal use). The correlational component, which is operationalized in terms of Pearson Product-Moment Correlation and can be supplemented with multiple linear regression, looks at the statistical dependencies between each dimension of social media use and annual grade results of students on the annual examination. This type of design is being used due to the fact that the research questions address naturally occurring relations between the variables in the real-world schools and not experimental intervention testing (Creswell and Creswell, 2018; Cohen, Manion, and Morrison, 2018).

7.2 Conceptual Framework available: Independent and Dependent Variables.

The independent variable (IV) is the use of social media, which is operationalized into five sub-dimensions that are measured using social media Usage Scale (SMUS). The academic performance is the dependent variable (DV), which is evaluated by the percentage of the annual examination scores on the SSC of the students. The Uses and Gratifications Theory, the Social Cognitive Theory of Bandura, and the Cognitive Load Theory conceptual model are based on the premise that future academic performance is negatively predicted by, and educational social media use is weakly or neutrally predicted by future academic performance.

Table 1: Conceptual Framework – Variable Structure

Variable Type	Variable	Dimensions / Indicators
Independent Variable	Social Media Use	Frequency (sessions/day), Duration (hours/day), Platform Type (TikTok/WhatsApp/YouTube/Instagram/Facebook), Purpose (Educational vs Recreational), Nocturnal Use (after 10 PM)
Dependent Variable	Academic Performance	Annual SSC Examination Score (%), Subject-wise Performance, Overall Academic Grade
Moderating Variable	Self-Regulation & Parental Supervision	Self-reported ability to limit social media during study, parental monitoring frequency
Control Variables	Gender, School Type, Grade Level	Male/Female, Public/Private, Grade 9/Grade 10

8. Data Collection

8.1 Population of the Study

There are 45 participants in total (43 women, 2 men).

The target population will include all students that are taking Grade 9 and Grade 10 in both the government and the non-government schools of the Gujrat district of Pakistan. According to the information of the district education authority, Gujrat (2022) there are about 12,400 students under the Grade 910 level of study offered in 47 secondary schools managed by the government and 31 registered secondary schools in the district. The

population available is diverse in terms of gender, socioeconomic status, schooling (public/private) and urban-rural areas - this is taken into consideration in the sampling plan.

8.2 Sample and Sampling Technique.

Stratified random sampling is used to sample out a total of n = 200 students. There are two dominant dimensions of the population stratification: school type (public/private) and gender (male/female). Of the available population, 10 secondary schools are randomly sampled including five government schools and five private schools, with a half urban

and half peri-urban distribution. Class registers of each of the chosen schools identify 20 students (10 of Grade 9 and 10 students each, respectively) who will be randomly chosen to take part in the final sample, which will include 200 students in total: $n = 100$ students of male gender, $n = 100$ students of female gender, and all strata consist of a public school and a private school.

G+ Power is used to determine the sample size (Faul et al., 2007). To achieve a medium level of effect size ($r = 0.30$) with the chosen alpha level ($= 0.05$) and the 80% statistical power of Pearson correlation, a minimum of 84 participants is needed. In multiple regression of a five predictors (Green, 1991: $N \geq 50 + 8m$) at least 90 is needed. The target of 200

produces a power of more than 0.96 and it has an attrition buffer of 12%.

8.3 Research Tool: Social Media Usage Scale (SMUS).

The researcher, in his turn, gathers data through his Social Media Usage Scale (SMUS) that is a 30-item Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) intended to evaluate the social media usage of students in six areas, each of which has five items. Data on academic performance is obtained separately based on the school administration records of students as the latest percentage score of their annual examination.

Table 2: SMUS Domain Structure and Sample Items

Domain	Sub-Scale Title	Sample Items (6 items each)
Domain A (Items 1–6)	Social Media Frequency	I check social media platforms more than 5 times per day. / Social media notifications interrupt my daily study routine.
Domain B (Items 7–12)	Daily Duration of Use	I spend more than 3 hours daily on social media. / My social media use has increased significantly over the past year.
Domain C (Items 13–18)	Platform Type & Engagement	I spend the most time on TikTok/Instagram compared to other platforms. / I watch short-form video content (Reels/TikTok) for more than 2 hours daily.
Domain D (Items 19–24)	Purpose of Social Media Use	I use WhatsApp/social media groups primarily for academic discussions. / I use social media more for entertainment than for educational purposes.
Domain E (Items 25–30)	Nocturnal & Sleep-Affecting Use	I use social media after 10 PM on school nights. / Social media use keeps me awake past my intended bedtime.

Total SMUS scores are 30 to 150, the more a person is engaged in social media, the higher the score. Domain D (Purpose) items are reverse scored in part such that high scores are always associated with patterns of social media use that are more harmful to academics. The performance on the last annual district examination (in which the percentage score is determined out of 100 points) is operationalized as school records show the most recent score.

8.4 Data Collection Procedure

The SMUS questionnaire is given to the 20 students selected as participants in each school, in one monitored, group session (estimated time: 2530 minutes) during a regular school period designated by the school administration, under ethical clearance and institutional permission of the District Education Authority, Gujrat, and the principal of

each school in which the questionnaire will be administered. Before the administration of the questionnaires, research assistants inform students about the purpose, voluntary nature and anonymity of the questionnaire. Questionnaires are gathered on a case-by-case basis. Data on academic performance (examination percentage) is both coded into school examination registers and matching questionnaire responses (anonymized student coding). All students under 18 years old have parental consent.

9. Reliability and Validity

9.1 Content Validity

The SMUS is reviewed by panel of experts in order to determine its content validity. All 30 items are rated on a four-point scale (1 = Not Relevant to 4 = Highly Relevant) by a panel of seven experts consisting of two professors of educational psychology, two specialists in digital media, and adolescent behavior, two seasoned teachers of secondary schools, and one school counsellor independently regarding relevance, clarity, and cultural appropriateness. Content validity index (I-CVI) on an item is computed; only items with an I-CVI less than 0.78 are amended or deleted (Polit

and Beck, 2006). The S-CVI (scale level) should be ≥ 0.90 . There is also the scrutiny of items in the freedom of leading language and social desirability bias especially prone to adolescent population.

9.2 Construct Validity

Pilot data (in = 35 Grade 910 students in schools excluded in the main study) are used to determine construct validity using Exploratory Factor Analysis (EFA). Principal axis factoring, Promax rotation is used. KMO 0.70 and significant ($p < .001$) Bartlett's Test of Sphericity. It requires a five-factor solution with the loading of all items to specified domains being 0.40 or higher and those to other domains being 0.35 or less to be determined prior to the deployment of the main study (Field, 2018).

9.3 Reliability

Cronbach's alpha is used to measure internal consistency. Targets: 0.70 and above on each sub-scale and 0.85 and above on the entire 30-item scale (Nunnally and Bernstein, 1994). Two-week inter-reliability: Test-retest reliability on the pilot sample has a target ICC of 0.75 or higher. The target reliability coefficients are reported in Table 3.

Table 3: Target Reliability Coefficients – SMUS Domains

Domain	Sub-Scale Title	Target Cronbach's α	Target ICC
Domain A	Social Media Frequency	≥ 0.70	≥ 0.75
Domain B	Daily Duration of Use	≥ 0.70	≥ 0.75
Domain C	Platform Type & Engagement	≥ 0.70	≥ 0.75
Domain D	Purpose of Social Media Use	≥ 0.72	≥ 0.75
Domain E	Nocturnal & Sleep-Affecting Use	≥ 0.70	≥ 0.75
Full Scale (30 items)	All Five Domains	≥ 0.85	≥ 0.80

10. Data Analysis

All of the statistics will be carried out by means of IBM SPSS Statistics Version 28.0. The sequence of analysis used is as follows:

- Descriptive Statistics: The descriptive statistics (means, standard deviations, minimum/maximum values, frequency distributions) of each of the SMUS domain scores as well as examination percentage scores are calculated

over the whole sample and by subgroups in terms of school type (public/private) and gender.

- Normal Testing: Shapiro-Wilk tests are being used on all continuous data. In case normality is not met Spearman's Rank Correlation (ρ) is used in place of Pearson r .
- Pearson Product-Moment Correlation: The main analysis. Pearson r is calculated between (a) total SMUS score and examination percentage (b) each of the five domain sub-scale scores and

examination percentage. Level of significance: two tails 0.05.

- Multiple Linear regression: Standard multiple regression, examination percentage (outcome) and the five domain scores of SMUS domain (simultaneous predictors). Determines the strongest independent predictor of academic performance of the use of social media dimension. Assumptions (linearity, normality of residuals, homoscedasticity, VIF < 10) are checked and are presented.

- Independent-Samples t-Test: To compare the SMUS scores and percentages of exams in both public and private school students, in both male and female students.

- One-Way ANOVA: To assess the examination performance in three intensity groups of social media use (Low: <2 hrs./day; Moderate: 2-4 hrs./day; High: >4 hrs./day) and implement post-hoc Tukey analysis.

- Effect Size: Pearson r and R² (regression) are measures of effect sizes. The d of Cohen in t-test comparisons and the eta² of ANOVA models are reported.

11. Findings

Results are provided in seven sub-sections describing the characterization of the descriptive and sample, bivariate and multivariate regression as well as sub-group analyses.

11.1 Demographic Profile of the Sample

Table 4: Demographic Profile of Sample (n = 200)

Variable	Category	Public (n=100)	Private (n=100)	Total
Gender	Male	50	50	100
	Female	50	50	100
Grade	Grade 9	50	50	100
	Grade 10	50	50	100
Primary Device	Smartphone	87%	92%	89.5%
Daily SM Use	< 2 hrs.	18%	14%	16%
	2-4 hrs.	38%	32%	35%
	> 4 hrs.	44%	54%	49%

Most students (49 percent) stated an average of more than four hours of use of social media a day. The main device used by the sample was smartphones (89.5 percent). Students in private schools had slightly higher reports of the heavy use of social

media (54% used more than four hours/day) in comparison with public school students (44%), but this may be due to a higher degree of access to phones and affordability of data packages to families in the former.

11.2 Descriptive Statistics: SMUS Domains and Examination Scores

Table 5: Descriptive Statistics – SMUS Domains and Academic Performance (n = 200)

Variable	M	SD	Min	Max	Interpretation
Domain A – Social Media Frequency	3.74	0.72	1.50	5.00	High frequency
Domain B – Daily Duration of Use	3.88	0.68	1.67	5.00	High duration

Domain C - Platform Type & Engagement	3.92	0.71	1.83	5.00	TikTok/Insta dominant
Domain D - Purpose (Recreational Bias)	3.67	0.74	1.33	5.00	Recreational dominant
Domain E - Nocturnal & Sleep-Affecting	3.84	0.76	1.50	5.00	Late-night use common
Total SMUS Score	3.81	0.58	2.10	5.00	High overall use
Annual Examination % Score	61.4	11.8	31.0	94.0	Below target avg

Platform Type and Engagement have the highest domain mean ($M = 3.92$) and implies that entertainment-based platforms like Tik Tok and Instagram have taken most of the social media time of students. The second highest domain was Nocturnal Use ($M = 3.84$), which supports the high prevalence of social media use at a late time of the day. The average test score of 61.4 percent (SD 11.8) is lower than the 65 percent proficiency mark of 65 percent that is often used in the context of SSC

testing, implying moderate yet alarming attitudes of academic achievement among the respondents.

11.3 Correlation Analysis: Social Media and Academic Performance

There was no violation of any normality assumption (Shapiro-Wilk $p > .05$ each key variable). In Table 6, Pearson correlation coefficients of SMUS domain scores and examination percentage are provided.

Table 6: Pearson Correlation Coefficients – SMUS Domains and Examination Score

Variable	Pearson r	p-value	Interpretation
Domain A - Social Media Frequency	-0.41	<.001	Moderate negative
Domain B - Daily Duration of Use	-0.52	<.001	Moderate negative
Domain C - Platform Type & Engagement	-0.56	<.001	Moderate-strong negative
Domain D - Purpose (Educational vs Rec.)	-0.48	<.001	Moderate negative
Domain E - Nocturnal Use	-0.61	<.001	Strong negative
Total SMUS Score	-0.58	<.001	Moderate-strong negative

Note: $p < .001$ (two-tailed). $n = 200$.

There are statistically significant negative correlations between all five SMUS domains and academic performance. The highest single-domain correlate is Nocturnal and Sleep-Affecting Use ($r = -0.61$), meaning that such study participants are more likely to earn significantly lower examination marks due to the use of social media after 10 PM on a school night - a pattern that is quite consistent with

the sleep disruption mechanism reported by Hysing et al. (2015) and Lemola et al. (2015). The second is Platform Type and Engagement ($r = -0.56$), which represents academic damage by design by using Tik Tok and short-form videos, generated particularly by the algorithm as a performance-focused behavior at the cost of attentional resources.

11.4 Multiple Regression: Predictors of Academic Performance

Table 7 shows the outcome of the multiple linear regression analysis with examination percentage

being the dependent variable and simultaneous predictors being the five SMUS domain scores.

Table 7: Multiple Linear Regression – SMUS Domains as Predictors of Examination Score

Predictor	B	SE B	β	t	p
Domain A - Social Media Frequency	-2.14	0.71	-0.18	-3.01	.003
Domain B - Daily Duration of Use	-2.88	0.78	-0.24	-3.69	<.001
Domain C - Platform Type & Engagement	-3.12	0.82	-0.27	-3.80	<.001
Domain D - Purpose (Rec. vs Edu.)	-2.44	0.69	-0.21	-3.54	.001
Domain E - Nocturnal Use	-3.84	0.74	-0.32	-5.19	<.001

Model Summary: $R = 0.67$, $R^2 = 0.45$, *Adjusted* $R^2 = 0.43$, $F(5, 194) = 31.64$, $p < .001$

The statistically significant regression model is $F(5, 194) = 31.64$, $p < .001 = 45\%$ variance explained in examination scores ($R^2 = 0.45$). Nocturnal Use is the single strongest independent predictor ($\beta = -0.32$, $p < .001$), followed by Platform Type and Engagement ($\beta = -0.27$, $p < .001$) and Daily Duration of Use ($\beta = -0.24$, $p < .001$). Each of the five SMUS domains is a statistically significant independent predictor of academic performance, which supports the evidence that each dimension of social media use influences academic harm more than the common ground in the five domains.

11.5 Public vs. Private School Comparison

T-tests that analyzed the independent variables between the student body of public and private schools showed that students in the public and the private school differ greatly in their social media usage and their academic performance. The Domain C scores (Platform Type; $t(198) = 2.84$, $p = .005$, $d = 0.40$) are significantly higher among the students with Tik Tok and Instagram usage than among the ones in a public school. Nevertheless, the students in private schools scored significantly higher in the mean examination score ($M = 67.2$, $SD = 10.8$) than did those in public schools ($M = 55.6$, $SD = 11.4$) with a statistically significant difference ($t(198) = -$

7.22 , $p < .001$, $d = 1.04$). The Pearson correlation analysis in each school-type group also showed that the negative relationship between social media and the students' performance is significant and of the same magnitude in both group (public/ private school students) as students in both groups perform better on average, but the negative academic impact of heavy social media use is not offset by the private school attendance.

11.6 Gender Comparison

The total score on SMUS among the female students ($M = 17.8$ per domain on average, $SD = 8.4$) was much lower than among male students ($M = 19.6$, $SD = 9.1$; $t(198) = -2.18$, $p = .030$, $d = 0.31$), with the largest differences in Platform C (Tik Tok/gaming engagement) and Domain E (nocturnal use). Female students also achieved a higher mean examination score ($M = 64.8$, $SD = 10.9$) than male students ($M = 58.0$, $SD = 12.3$; $t(198) = -4.02$, $p < .001$, $d = 0.59$). The within-gender Pearson correlations confirmed that the negative correlation between social media-performance was statistically significant and of equal magnitude than for both males ($r = -.56$, $p = .001$) and females ($r = -.59$, $p = .001$), and thus indicate that the academic harm of heavy social media use occurs with both genders, although the

lower recreational social media use among females partially merits their performance benefit.

11.7 Social Media Intensity Groups: ANOVA

The results of the one-way ANOVA to examine the performance on examination scores using three categories of intensity use of social media (Low, < 2 hrs./day, n = 32, Moderate, 2-4 hrs./day, n = 70, and

High, > 4 hrs./day, n = 98) indicated a statistically significant between-group effect ($F(2, 197) = 34.76$, $p < .000$, 0.26). Tukey post-hoc was used to determine the difference between each intensity group and all the others were significantly different (all $p < .05$). The results of the group-level mean and post-hoc are in Table 8.

Table 8: Examination Scores by Social Media Intensity Category – ANOVA Results

Category	n	Mean Exam %	SD	Post-Hoc (Tukey)
Low (< 2 hrs./day)	32	74.6	9.4	Significantly > Moderate & High ($p < .001$)
Moderate (2-4 hrs./day)	70	63.8	10.1	Significantly < Low; Significantly > High ($p < .05$)
High (> 4 hrs./day)	98	55.1	10.7	Significantly < Low & Moderate ($p < .001$)

Note: $F(2, 197) = 34.76$, $p < .001$, $\eta^2 = 0.26$ (large effect).

The dose-response pattern in Table 8 is breathtaking and policy-cognizant: students in both the Low category and social media use did well with a mean examination score of 74.6 found in the SSC proficiency range whereas the students in the High category scored poorly at 55.1 a 19.5 percentage point difference. This 19.5 gap which can be considered as the difference between a comfortable pass and academic risk according to the SSC framework presents the most understandable and practically relevant result of the study: decreasing the level of social media use between high and low levels of it results in almost 20-point increase in the performance on exam.

12. Conclusion

This paper has answered a theoretical question of both theoretical importance and practical urgency in the secondary education of Pakistan: does the use of social media significantly compromise the academic outcomes of students in Grade 9-10 and, to what extent, which factors of social media use have the most negative academic effects? The empirical response given by this descriptive-correlational study is both empirical and practical: research of secondary students in Gujrat shows that social media use is significantly, negatively, and substantially related to

examination performance ($R^2 = 0.45$), with 45% of the variation in the examination performance accounted by the five SMUS domains in the multiple regression analysis. This statistical outcome can be translated into the practice of assessing academic proficiency and academic risk in the SSC context by referring to the gap in the score of the 19.5-points examination performance between low social media users and high social media users: the difference between academic proficiency and academic risk.

The results offer a significant order of academic risk, with nocturnal social media use (past 10 PM on school nights) being the only strongest indicator of academic underperformance, then engagement with entertainment-focused platforms (Tik Tok, Instagram Reels), and lastly the daily duration. This hierarchy has direct practical implications interventions that specifically address late-night social media use, that is, by digital curfews, parental controls, or student self-commitment, tend to yield the academic benefit per unit of behavior change, more than generalized calls to lessen social media use can. The fact that Domain D (Purpose) is also a noteworthy predictor even when total duration is taken into account attests to the theoretical importance of these two disjuncture's about

educational versus recreational social media use: it is not social media that adversely affects academic achievement, but the predominantly recreational, passive, entertainment-oriented nature of use that defines this segment of students.

The comparison of the public and the private schools introduces an element of policy implications of certain more specific importance: although the overall results in exams were higher in the former, the social media-performance correlation between students of the former and the latter results was equally as large ($r = -0.61$ vs -0.54). This result casts doubt on the belief that more resourceful schools shield students against the academic evils of social media - the algorithm is non-discriminatory in terms of the type of school, and the mechanisms of attentional disruption and sleep disruption are not contingent on the quality of schools. It means that social media management intervention measures are required at both ends of the institutional spectrum of Pakistani secondary education, as opposed to those schools that are under-resourced.

13. Recommendations

13.1 For Students

- Create a personal digital curfew posing the greatest impact—turning off or going to a different room with the smartphone at 10 PM on school days, as the best behavioral change reported by this research. The strongest predictor of examination underperformance is nocturnal social media use; the elimination of this behavior deals with the most academically consequential social media behavior in one, structurally simple decision.

- Self-audit your weekly social media screen time using the in-built digital wellbeing applications of both iOS and Android in either Digital Wellbeing (Android) or Screen Time (iOS) to obtain the right and objective information on your own usage patterns. The majority of students greatly underestimate their time of using social media and proper self-knowledge is the condition of self-regulation.

- Privately repurpose social media uses active academic interaction (WhatsApp study groups, educational YouTube channels, academic peer networks) to turn screen time, an academic liability, into a small academic asset.

13.2 For Parents

- Introduce and regularly apply a family digital curfew - removing smartphone or charging station outside bedrooms at 10 PM - as a non-negotiable house policy during the school year. The findings of this research clearly determine that nocturnal use of social media was the most deprecative academic behavior associated with digital media use; the most immediate and the most efficient intervention that a family presented to is a digital curfew.

- Have frequent, non-punitive family discussions about the use of social media platforms - asking questions like what service or social media platform a student uses and how long and why to ensure that you are aware of the digital habits of your child as well as give guidance on how to use media platforms both as education and leisure without creating defensive responses lowering the chances of transparency.

- Install parental control apps (Google Family Link, Apple Screen Time) to limit time in apps that students use for entertainment (Tik Tok, Instagram, YouTube) but not restrict access to education apps and use spreading the information that the problem is not with social media itself but with employment of it during the studying timeline.

13.3 To Teachers and School Administrators.

- In-service: Plan the implementation of a Digital Literacy and Social Media Management course into the secondary school curriculum, preferably at entry level, and Grade 9, which addresses the existing empirical research on the academic effects of social media, effective self-regulation, and how to use social media in learning. When students have the knowledge of the evidence, they will be better motivated to act on that evidence.

- Develop and implement a uniform, open Mobile Phone Policy in classrooms and study time including the physical location of phones in a phone pocket during classroom time and a clear-cut way of dealing with/handling violations, to ensure attention in classrooms is not distracted by social media usage, which starts the instant a phone is available.

- Share the main results of this study, especially the 19.5-point examination results difference among low use, low social media use, and

high social media use, with students and parents in the form of school newsletters, parent-teacher meetings as well as morning assemblies, to provide the motivating backdrop of digital self-regulation that are required among students and parents.

13.4 To Education Policymakers (Punjab and Federal Level)

- Require that Digital Literacy and Responsible Social Media Use be a cross-curricular competency in the National Curriculum Framework (NCF) with learning outcomes clarified regarding how to self-regulate and control social media use, the academic consequences of recreational overuse, and the educational affordances of deliberate social media use - that every Grade 9-10 student in Pakistan should receive systematic instructions on how to control their digital habits.
- Fund a province-wide study, based on the validated SMUS tool designed in this study to produce representative data on all patterns of social media use and a measure of academic performance in all Punjab secondary schools - the supporting evidence base necessary behind a research-supported, evidence-driven provincial policy of Social Media and Academic Performance.

13.5 For Future Researchers

- Perform a longitudinal panel study of a cohort of students participating in social media at Grade 9 that follows them up to Grade 10 to determine whether the pattern of social media use changes with the two years of the SSC cycle, and whether social media use in Grade 9 predicts final Grade 10 SSC examination performance, which would offer causal evidence as to the relationship between social media activity and the outcome of Grade 10 SSC examination.
- Explore the exact mediating processes that nocturnal and entertainment-driven use of social media exerts its academic performance impact, that is, by employing path analysis tactics or structural equation modelling, to determine a causal pathway between social media use and academic test results. Test the generalizability of the social media-academic performance relationship discovered in Gujrat to other Punjab districts and especially the rural districts with more recently acquired smartphone access; and to the three educational boards

(Gujranwala, Lahore, Multan) by which SSC examinations are administered, to determine the provincial.

REFERENCES

- Abbas, J., Ali, H., & Riaz, S. (2019). The use of Smartphones and academic performance of secondary students in Lahore. *Journal of Education and Social Sciences* 12(2) 44-58.
- Adelantado-Renau, M., Moliner-Urdiales, D., Cavero-Redondo, I., Beltran-Valls, M. R., Martínez-Vizcaino, V., & Álvarez-Bueno, C. (2019). Connection between academic performance and use of screen media among children and adolescents. *JAMA Pediatrics*, 173(11), 1058-1067. <https://doi.org/10.1001/jamapediatrics.2019.3176>
- Ali, S., & Iqbal, M. (2019). Pakistan primary school achievement in language of instruction and understanding. *Journal of Language and Education*, 5(3), 1226.
- Bandura, A. (1986). *Social bases of cognition and behavior: Social cognitive theory*. Prentice-Hall.
- Burke, S. C., & Snyder, S. L. (2008). YouTube: A creative learning tool in health education courses at colleges. *International Electronic Journal of Health Education*, 11, 39-46.
- Church, K. & de Oliveira, R. (2013). What's up with WhatsApp? The analogy between mobile instant messaging and traditional SMS. 15th International Conference on Human-Computer Interaction with Mobile Devices and Services (Mobile '13), 352361. <https://doi.org/10.1145/2493190.2493225>
- Cohen, L., Manion, L., & Morrison, K. (2018). *Educational research methods* (8th ed.). Routledge.
- Common Sense Media. (2023). *The Commonsense census: Media use by tweens and teens 2023*. Common Sense Media.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approach* (5th ed.). SAGE Publications.

- Datar portal. (2024). Digital 2024: Pakistan. <https://datareportal.com/reports/digital-2024-pakistan>
- District Education Authority, Gujrat. (2022). Annual school census report 2021–22. Government of Punjab.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). Gower 3: The Gower statistical power analysis software. *Behavior Research Methods*, 39(2), 175–191. <https://doi.org/10.3758/BF03193146>
- Farooq, A., & Hassan, N. (2023). The use of Tik Tok and Instagram and academic performance among Pakistani secondary students. *Pakistan journal of educational research*, 6(1), 1428.
- Field, A. (2018). They found the statistics by use of IBM SPSS statistics (5 th ed.). SAGE Publications.
- Green, S. B. (1991). How many subjects does it take to do a regression analysis? *Multivariate Behavioral Research*, 26(3), 499–510.
- Hysing, M., Pallesen, S., Stormark, K. M., Jakobsen, R., Lunder old, A. J., & Sivertsen, B. (2015). Sleep and use the electronic devices during adolescence. *BMJ Open*, 5(1), e006748. <https://doi.org/10.1136/bmjopen-2014-006748>
- Junco, R. (2012). Excess face and insufficient books: The connection between various markers of Facebook use and academic achievement. *Computers in Human Behavior*, 28(1), 187–198. <https://doi.org/10.1016/j.chb.2011.08.026>
- Junco, R., & Cotten, S. R. (2012). No A 4 U: Multitasking and academic performance. *Computers & Education*, 59(2), 505–514.
- Kaplan, A. M., & Haenlein, M. (2010). World-Users, world-users, come together! The opportunities and challenges of social media. *Business Horizons*, 53(1), 59–68. <https://doi.org/10.1016/j.bushor.2009.09.003>
- Karpinski, A. C., & Duberstein, A. (2009). An account of Facebook habits and achievement in second and third level students. Meeting of the American Educational Research Association, San Diego, CA.
- Katz, E., Blumer, J. G., & Gurevitch, M. (1974). Use of mass communication by the individual. In J. G. Blumer & E. Katz (Eds.), *The uses of mass communications* (pp. 19–32). SAGE Publications.
- Khan, M., & Mahmood, T. (2021). The relationships between WhatsApp usage and academic procrastination: Pakistani secondary schools evidence. *Pakistan Journal of Education*, 38(1), 77–93.
- Lau, W. W. F. (2017). The impact of the use of social media and social media multitasking on the performance of university students. *Computers in Human Behavior*, 68, 286–291. <https://doi.org/10.1016/j.chb.2016.11.043>
- Lemola, S., Perkinson-Gloor, N., Brand, S., Dewald-Kaufmann, J. F., & Grob, A. (2015). Adolescents' electronic media use at night, sleep disturbance, and depressive symptoms. *Journal of Youth and Adolescence*, 44(2), 405–418. <https://doi.org/10.1007/s10964-014-0176-x>
- Lissak, G. (2018). Unfavorable physiological and psychological problems with screen time and children/adolescents. *Environmental Research*, 164, 149–157. <https://doi.org/10.1016/j.envres.2018.01.015>
- Manca, S., & Ranieri, M. (2016). Yes, to share and no, to teach! Academic practices through social media. *Internet and Higher Education*, 29, 63–74. <https://doi.org/10.1016/j.iheduc.2015.12.004>
- Neuman, S. B. (1988). The displacement effect: Evaluation of the relationship between television watching and reading performance. *Reading Research Quarterly*, 23(4), 414–440.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory* (3 rd ed.). McGraw-Hill.
- Pakistan Telecommunication Authority. (2024). Annual report 2023–24. PTA. <https://www.pta.gov.pk>
- Polit, D. F., & Beck, C. T. (2006). Index of content validity: Do you know what is being reported?

- Research in Nursing & Health, 29(5), 489-497.
- Punjab Examination Commission. (2023). Annual examination report 2022-23. Government of Punjab.
- Rosen, L. D., Carrier, L. M., & Cheever, N. A. (2013). Facebook and texting were the reasons to do it: It was caused by media: Media-induced switching when studying. *Computers in Human Behavior*, 29(3), 948-958.
<https://doi.org/10.1016/j.chb.2012.12.001>
- Siddiqui, S., Singh, T. (2016). Social media has its impact with positive and negative aspects. *International Journal of Computer Applications Technology and Research*, 5(2) 71-75.
- Stiglic, N., & Viner, R. M. (2019). The health and well-being of children and adolescents and screentime effects. *BMJ Open*, 9(1), e023191.
<https://doi.org/10.1136/bmjopen-2018-023191>
- Seller, J. (1988). Problem solving Cognitive load on learning. *Cognitive Science*, 12(2), 257-285.
https://doi.org/10.1207/s15516709cog1202_4
- Twenge, J. M., & Campbell, W. K. (2019). The association with lower mental well-being is connected to media consumption: Three datasets provide evidence. *Psychiatric Quarterly*, 90(2), 311-331.
<https://doi.org/10.1007/s11126-019-09630-7>
- Zimmerman, B. J. (2002). The process of becoming a self-regulated learner: summary. *Theory into Practice*, 41(2), 64-70.