



## Research Article

## Influence of Social Media Usage on Students' Academic Performance and Study Habits: A Mixed-Method Analytical Study

Dr. Deepika Sharma

Associate Professor, Department of Education, Jagannath University, Jaipur, Rajasthan, India

Corresponding Author: \* Dr. Deepika Sharma

DOI: <https://doi.org/10.5281/zenodo.20845557>

### Abstract

**Background:** Social media is ingrained in students' lives. This creates opportunities for digital platforms to enhance peer learning. However, social media use can also lead to distraction, procrastination, and poor time management. This study analyses the consequences of social media use on students' academic performance and study habits. Using a mixed-method approach, this study examines verified secondary data and qualitative synthesis. In the quantitative portion, I examined the Mendeley Data record, "Dataset on Social Media Usage, Academic Performance, and Productivity Behaviours among Students," which surveyed 1,501 students in Dhaka, Bangladesh. Because I was unable to retrieve the individual-level CSV, I relied on verified aggregate distributions and the model performance published in the associated peer-reviewed article in the IEEE Access journal. In the qualitative portion, I conducted a secondary thematic synthesis of the peer-reviewed studies on social media, distraction, and self-regulated learning. Over three hours of social media use was reported by 52.5% of participants. During study sessions, 53.0% used social media, and 52.1% procrastinated on social media. Moderate to significant focus loss was reported by 62.5%. The dominant social media platforms were Facebook (49.5%), YouTube (14.9%), and Instagram (11.4%). According to the associated predictive analysis, the HPrEd soft-voting ensemble's accuracy was 98.41%, and the average F1 score was 98.32%. The top factors of study delay and focus loss were of particular interest, along with the distraction of coursework and the perceived productivity of social media.

**Conclusion:** The evidence allows for a nuanced view: Using study-related resources in a moderate and intentional manner may aid learning, while frequent use that coincides with studying relates to distraction and procrastination and may negatively affect one's academic productivity.

### Manuscript Information

- ISSN No: 2583-7397
- Received: 11-05-2026
- Accepted: 20-06-2026
- Published: 25-06-2026
- IJCRM:5(3); 2026: 1149-1165
- ©2026, All Rights Reserved
- Plagiarism Checked: Yes
- Peer Review Process: Yes

### How to Cite this Article

Sharma D. Influence of Social Media Usage on Students' Academic Performance and Study Habits: A Mixed-Method Analytical Study. Int J Contemp Res Multidiscip. 2026;5(3):1149-1165.

### Access this Article Online



[www.multiarticlesjournal.com](http://www.multiarticlesjournal.com)

**KEYWORDS:** social media usage; academic performance; study habits; procrastination; focus reduction; mixed-method research; educational data mining

## 1. INTRODUCTION

### 1.1 Background of the Study

The new reality of schooling is dominated by constant digitization. Instant communication and group discussions encourage the use of social media in education. Educational videos and social media make the rapid sharing of information easier. However, social media and educational videos also compete for time when students do readings and complete assignments. Students prepare for exams and undertake study sessions in social media as well. Social media distracts students and steals their time. The educational world has to cope with the distraction and the intensified competition for a student's complete focus. Social media can lead to achievements, if only students are aware of how social media is competing with educational focuses. The same media platform can lead to productive and unproductive uses, as seen in some studies done by Junco et al. (2010) and Karpinski et al. (2013).

This current research aims to study the students of Dhaka in Bangladesh. The study uses Mendeley Data to analyze social media use in study sessions and the resulting distraction of social media, focus deterioration, procrastination, and the impact on academic performance. South Asian students have explored education through hybrid digital environments. Distractions come in the form of social media and educational videos. The main goal is to determine how students use social media and if that impairs their focus and study habits.

### 1.2 Social Media Use in Student Life

Research indicates social media adoption is ubiquitous at all levels of education and is used for both educational and non-educational related activities. WhatsApp and Facebook were used by health students in an educational setting and for entertainment. Social media use was also found to be related to students' GPA, sleep, daily routines and study time. In another study, students were found to use WhatsApp, Telegram and YouTube for educational and social purposes; however, many students reported losing focus on school activities. From the research findings, it can be concluded that social media, when used for educational purposes, can have both a positive and a negative effect on education, depending on the context of the use, for example, social media use for recreational purposes during study time.

### 1.3 Academic Performance and Study Habits

There are many direct observable learning activities that affect academic performance. Examples of these activities are participation in class and out of class learning, completion of learning tasks, and cooperation with peers. Other activities are the use of learning resources and the teachers' guides. Study habits consist of more observable activities that are less direct. For example, the ability to study daily and at specific times, the ability to concentrate while learning, the ability to avoid procrastination. Social media use in the learning environment should be regulated, as using it excessively and without any control can disrupt the activities listed above.

### 1.4 Problem Statement

The evidence connecting higher social media use to worse academic results presented in the literature generally suffers from a number of limitations. These include smaller sample sizes, focusing on one institution, narrower disciplinary bands, or a simple bivariate model. In addition, studies often neglect to differentiate study-related social media use, disruptive notifications, procrastination, social media platforms, or the perceived loss of productivity, and often measure social media usage solely based on total daily usage. This study aims to overcome the limitations of previous studies by employing a data set with multiple social media usage behavior and engagement cobeaviors, and by combining quantitative, descriptive data with qualitative, thematic data.

### 1.5 Research Gap

There are three central gaps that this study aims to address. First, multiple studies focus on the use of social media as a single, generic behavior. Study-related social media and social media usage for entertainment may have distinct consequences for academic performance. Second, most studies emphasize academic performance and neglect the study-related behaviors of procrastination, study-related latency, lack of concentration, and lack of control of time. Third, purely quantitative studies may document statistical behaviors, but they lack the explanatory, normative, and prescriptive dimensions that identify the behaviors of attention, habit, and peer social learning and self-regulation (Braun & Clarke, 2006).

### 1.6 Research Objectives

The aim of this study is fourfold. First, secondary data will be analyzed to present a comprehensive account of the social media usage patterns among students. Second, social media usage data will be analyzed to determine its relationship, if any, with study session distractions, procrastination, loss of concentration, coursework distractions, and the social media usage data perceived to have a negative influence on students' academic performance. Third, social media usage data will be analyzed through the lenses of the uses and gratification model, self-regulated learning, cognitive overload and time displacement to determine its effect on the study patterns of students. Finally, the quantitative data will be analyzed and integrated with the qualitative data in the form of themes, to identify possible recommendations and initiatives for students, teachers, educational institutions, and for the formulation of digital well-being policies.

### 1.7 Research Questions

**RQ1:** How is social media usage distributed among students in the verified dataset? **RQ2:** How often do students use social media while studying, procrastinate with social media, and are interrupted by social media notifications? **RQ3:** How many students report that social media usage decreases their focus, distracts them from coursework, disrupts their time management, and has a negative effect on their academics? **RQ4:** What do qualitatively oriented peer-reviewed studies suggest about the social media usage and study-related behavior mechanisms?

**RQ5:** What analyses must be conducted on the raw individual-level data to make an inference?

### 1.8 Research Hypotheses

**H1:** There is a positive correlation between daily social media usage and the negative effect attributed to social media on academic productivity.

**H2:** There is a positive correlation between social media usage during study sessions and focus reduction.

**H3:** An academic impact is attributed to social media procrastination.

**H4:** Social media usage and an academic productivity outcome are connected; time-management difficulties and study procrastination are intermediary variables.

**H5:** Within various demographic groups, including gender and age, social media usage and academic productivity are related. Since the raw CSV could not be obtained in this session, these hypotheses are stated for the analyses of the full dataset, but are not tested in this version of the manuscript.

### 1.9 Study Significance

This research is important for educational psychologists, university administrators, educators, and students, as it challenges binary thinking of social media use as solely negative or positive. The research offers points of intervention for study-proximate social media use, procrastination, distraction, and time management. Digital self-regulation strategies are needed by students, while educators need assistance structuring social media for socially and academically productive purposes. Universities need digital self-regulation policies that deal effectively with disruptive digital media while allowing socially and academically productive digital media.

### 1.10 Paper Structure

There are eight main parts to this manuscript. The literature and theory are covered in Section 2. Section 3 is the mixed-methods research design with data sources, variables, and ethics. Verified aggregate results, along with descriptive statistics, tables, figures, and methods of mixed-methods research, are presented in Section 4. Section 5 analyses results within the context of theory and empirical research. Sections 6 to 8 cover recommendations, research limitations, final thoughts, declarations, references, and a reproducible appendix with the original data analysis.

## 2. REVIEW OF LITERATURE

### 2.1 The Concept of Social Media Use

Social Media Use encompasses a multitude of ways people electronically engage with a platform that supports the creation and sharing of digital content, messaging, networking, video viewing, commenting, sharing, and participating in a digital community. Within an educational context, Social Media Use can be purposeful and academic, or it can be browsing for entertainment, scrolling passively, messaging, and engaging with notifications. The educational impact of social media use is determined by purpose, how often one uses, how long one

uses, the context of one's use, and the extent of one's self-control.

### 2.2 Social Media and Academic Performance

Despite the scant evidence for and against the impact of social media on academic performance, it seems evident that poor and/or excessive use of social media negatively influences performance. Bhandarkar et al. (2021) found a weak negative linkage between social media use and the academic performance of some undergraduate medical students, combined with the observation of the increasing social media use of students with a lower academic performance. Chandrasena and Ilankoon (2022) found significant relationships between social media usage and GPA among the health sciences undergraduates. With that said, the use of social media for the purposes of assignment completion or viewing and making educational videos, or even social media use for peer engagement and academic discussions, can also be viewed as a positive use of social media (Junco et al., 2010; Sakhieva et al., 2024).

### 2.3 Social Media and Study Habits

Study habits are some of the most disrupted activities. Checking social media during study sessions can break concentration, force students to spend greater amounts of time to re-engage with academic materials, and worsen shallow academic processing. Junco and Cotten (2012) found that social media multitasking activities negatively impacted academic performance. This clearly indicates that the negative impact social media can have on academics may be more strongly linked to its usage disrupting study habits rather than the length of time spent on social media. A student that uses educational videos for the hour that he/she/they, spend on social media, during a study session, may have a more positive use of social media compared to someone that uses social media during the entire study session.

### 2.4 Social Media, Attention, Focus, and Procrastination

Attention is a finite resource. Cognitive load theory posits learning becomes more difficult when additional cognitive load interferes with the process of understanding and solving a given problem (Sweller, 1988). During study sessions, notifications and the social media platforms and their accompanying social rewards result in additional cognitive load, especially when the academic task requires coordination of the working memory. Procrastination is relevant as social media offers the instant gratification that causes the postponement of the more effortful academic tasks. Therefore, social media may indirectly affect the user's academic performance by decreasing their persistence, concentration, and time-on-task.

### 2.5 Positive Academic Uses of Social Media

Social media offers more than merely being a distraction; it can serve an academic purpose. For example, students can use YouTube for lessons, WhatsApp or Telegram for class groups, Facebook for post sharing, and LinkedIn for networking. Media users are thought to be goal-oriented and selective in their choice of media based on the type of need (Katz et al., 1974).

With social media, students are able to fulfill their academic goals, thereby increasing access to resources and enhancing peer engagement and cooperative instructional techniques.

### 2.6 Negative Academic Consequences of Excessive Social Media Use

There are significant drawbacks when social media use is excessive and habitual, especially when used concurrently with cognitively demanding study. The Mendeley dataset and analysis are unique in that they assess various aspects of diminishing focus, procrastination, study interruptions, notification-induced disruptive behavior, lost study time, and delays to study, using the same behavioral constructs (Ahmmed & Ahmed, 2025; Ahmmed et al., 2026). These constructs can identify the ways in which the disruptive nature of social media can affect academic performance.

### 2.7 Theoretical Framework

Four theories inform this study. The uses and gratifications theory describes student reliance on social media for info, entertainment, socialization, or academics (Katz et al., 1974). Self-regulated learning theory differentiates the productive use of a digital tool by a self-regulated individual, from the pervasive digital distraction experienced by others (Zimmerman, 2002). Cognitive load theory accounts for the disruptive nature of task-related digital social media notifications and other asynchronous communication (Sweller, 1988). Finally, time-dilation pertains to social media time extending into the time that was intentionally set aside for study.

### 2.8 Empirical Research Gap

There is a gap in research on social media and academic performance with a focus on the intensity of use, in a study context, procrastination, the disruption of attention, productivity, and other qualitative aspects. The current manuscript fills this gap by integrating a qualitative framework organized by study habits based on cumulative evidence from datasets.

### 2.9 Conceptual Framework

Per the framework, usages of social media can have both positive and negative impacts on academic performance. In this framework, social media can have negative impacts through time displacement and by providing less time to complete academic tasks. Additionally, reduced focus, procrastination, distraction, interruption, poor time management skills, and delayed task initiation can negatively impact performance through social media. Unsurprisingly, the negative impacts of social media can be lessened by academic self-regulation, platform purpose, age, gender, academic discipline, and social media's productive academic use. Social media's productive academic use can lessen the negative impacts of social media when purposeful, limited, and aligned with academic goals.

## 3. METHODOLOGY

### 3.1 Research Design

The study presents an explanatory sequential mixed-method design. The quantitative phase will focus on the collection of verified, aggregated data presented in the Mendeley dataset and the peer-reviewed studies associated with it. The qualitative phase will rely on the interpretation of the data and the secondary thematic synthesis of peer-reviewed studies. The integration phase will present a joint-display matrix which will combine the data with the explanatory themes. This design is appropriate for the research problem due to the need to address measurable behavioral patterns alongside interpretative components regarding the ways in which students' study habits are impacted.

### 3.2 Data Source

The main data source is the 'Dataset on Social Media Usage, Academic Performance, and Productivity Behaviors among Students,' published in Mendeley Data on March 19, 2025, version 1, DOI 10.17632/zv45t3hx2r.1. The contributors to this data are Jalal Ahmmed and Faruk Ahmed from Daffodil International University. The repository outlines 1,501 responses from students studying in Dhaka, Bangladesh, and includes the variables for social media usage and the use of social media during study sessions, focus, procrastination, and perceived academic performance (Ahmmed & Ahmed, 2025).

A relevant, peer-reviewed study published with the same dataset in IEEE Access describes proportionate values and offers machine-learning validation metrics based on the Hybrid Productivity Prediction (HPrEd) ensemble (Ahmmed et al., 2026). These aggregate results published in that study serve as confirmed quantitative data for this manuscript.

### 3.3 Population and Sample

The intended population is comprised of students in educational institutions in the Dhaka region of Bangladesh. The available sample consists of 1,501 students who participated in an online survey. This sample is population-specific and should not be considered representative of the entire country in the absence of further sampling data. Nonetheless, the survey sample is adequate for performing a descriptive analysis and, when the raw survey data in CSV format is made available, sufficiently large to conduct multivariable analysis under the right conditions.

### 3.4 Variables of the Study

The variables which are the subject of this study include dependent variables which consist of perceived academic impact, overall impact on productivity, delay in studies, reduction in focus, distraction due to coursework, time wastage, and perceived productivity without presence of social media. The independent variables consist of amount of time spent on social media on a daily basis, social media use during study sessions, checking social media during study sessions, notification interference, multitasking, frequency of social media breaks, and the social media platform used. The demographic variables of age and gender, which are included in the combined demographic table, are included as control variables.

### 3.5 Quantitative Analysis Plan

The analysis of raw data would encompass data screening, an analysis of missing values, calculation of descriptive statistics, reliability analysis, examination of bivariate associations, and the application of chi-square tests, and non-parametric tests for ordinal data among other procedures. Given that the current session provided only aggregate percentages, this manuscript presents only descriptive distributions and ordinal means, marginally derived, along with model performance statistics pertinent to Ahmmed et al. (2026). Other raw data dependent procedures such as correlation, regression, and mediation and moderation analyses have been purposefully omitted.

### 3.6 Qualitative Analysis Plan

Qualitative analysis placed emphasis on thematic synthesis rather than the construction of original interview studies. It represents a modification of Braun and Clarke’s (2006) six phase thematic analysis model and proceeds through the steps of: familiarization, initial coding, development of potential themes, review, naming, and interpretive synthesis of findings. Predominant themes in this qualitative research were generated from a number of peer-reviewed studies that examined the relationships between social media, academic performance, self-distraction, self-regulated learning and multitasking, as well as student productivity.

### 3.7 Mixed-method Integration

The integration of qualitative findings and quantitative results was accomplished through the construction of a joint-display table. Although the purpose of integration was to create a plausible explanatory account that describes the observed cross-sectional behaviors, the absence of longitudinal data precludes claims of causation.

### 3.8 Ethical Considerations

Only publicly accessible secondary data and peer-reviewed literature were utilized for this study. For this version of the manuscript, no additional human subjects were recruited. The Mendeley dataset is published under a CC BY 4.0 license. Future researchers using the raw individual-level data in CSV format are obligated to practice anonymization and use data in a responsible manner in compliance with their institution's ethics requirements.

## 4. DATA ANALYSIS AND RESULTS

### 4.1 Dataset Description

Table 1: Data source, verification status, and analytical use

Element	Verified information	Use in manuscript
Dataset title	Dataset on Social Media Usage, Academic Performance, and Productivity Behaviors among Students	Primary quantitative source
Repository and DOI	Mendeley Data, Version 1, DOI: 10.17632/zv45t3hx2r.1	Data citation and source note
Publication date	19 March 2025	Source verification
Contributors	Jalal Ahmmed and Faruk Ahmed	Data citation
Institution	Daffodil International University	Contextual description
Sample size	1,501 students	Denominator for approximate counts
Location	Educational institutions in Dhaka, Bangladesh	Contextual limitation
License	CC BY 4.0	Ethical and reuse statement
Raw CSV access	Listed in dataset metadata but not directly retrievable in this session	No raw-data p-values, correlations, or regressions fabricated

Source. Mendeley Data record and associated IEEE Access article (Ahmmed & Ahmed, 2025; Ahmmed et al., 2026).

Table 2: Variable map based on the verified questionnaire structure

Construct	Variable examples	Response scale
Demographics	Age group, gender	Nominal categories
Usage intensity	Daily social media usage	Less than 1 hour; 1-3 hours; more than 3 hours
Study-context use	Use during study sessions; checking during study; multitasking	Rarely, sometimes, often, always
Disruption mechanisms	Notification disruption; coursework distraction; focus reduction	Frequency or extent scale
Self-regulation	Usage limitation; study delay; time-management difficulty	Frequency or extent scale
Academic-productivity outcomes	Perceived academic impact; productivity without social media; overall productivity impact	Frequency or extent scale
Platform preference	Most used platform	Facebook, YouTube, Instagram, TikTok, Snapchat, LinkedIn, Twitter, others

Source. Questionnaire file and published variable descriptions associated with Ahmmed and Ahmed (2025).

### 4.2 Demographic Profile of Respondents

Table 3: Demographic profile of respondents

Variable	Category	Percentage	Approximate n
Age group	18-24 years	62.6	940
Age group	25-34 years	22.5	338

Age group	Below 18 years	14.8	222
Gender	Male	55.2	829
Gender	Female	41.7	626
Gender	Other	2.9	44

Note. Counts are rounded approximations from published percentages and N=1,501; totals may vary slightly due to rounding. Source: Ahmed et al. (2026).

The demographic pattern indicates a sample dominated by students aged 18-24 years (62.6%), followed by those aged 25-34 years (22.5%) and below 18 years (14.8%). The gender distribution is 55.2% male, 41.7% female, and 2.9% other. These distributions suggest that the dataset primarily captures

young adult students, which is appropriate for analysing study habits and social media engagement in higher and late-secondary educational contexts.

### 4.3 Descriptive Statistics of Social Media Usage

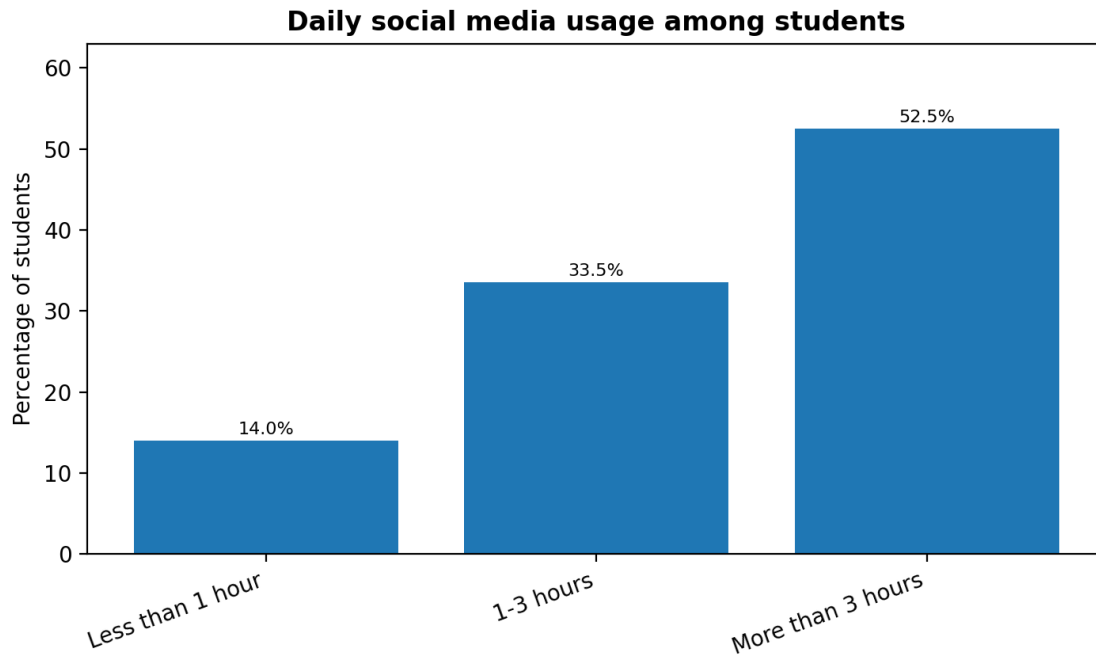
Table 4: Social media usage and study-behaviour distributions

Variable	Category	Percentage	Approximate n
Daily social media usage	Less than 1 hour	14.0	210
Daily social media usage	1-3 hours	33.5	503
Daily social media usage	More than 3 hours	52.5	788
Use during study sessions	Rarely	11.8	177
Use during study sessions	Sometimes	35.2	528
Use during study sessions	Often	34.0	510
Use during study sessions	Always	19.0	285
Procrastination due to social media	Rarely	12.9	194
Procrastination due to social media	Sometimes	35.0	525
Procrastination due to social media	Often	33.2	498
Procrastination due to social media	Always	18.9	284
Checking social media during study	Rarely	15.4	231
Checking social media during study	Sometimes	36.0	540
Checking social media during study	Often	29.0	435
Checking social media during study	Always	19.6	294
Notification disruption	Rarely	12.8	192
Notification disruption	Sometimes	32.8	492
Notification disruption	Often	35.0	525
Notification disruption	Always	19.4	291
Multitasking with social media	Rarely	13.5	203
Multitasking with social media	Sometimes	36.5	548
Multitasking with social media	Often	32.8	492
Multitasking with social media	Always	17.3	260
Social media break frequency	Rarely	11.9	179
Social media break frequency	Sometimes	35.5	533
Social media break frequency	Often	33.7	506
Social media break frequency	Always	18.9	284

Note. Counts are rounded approximations from published percentages and N=1,501. Source: Ahmed et al. (2026).

The most important usage finding is that a majority of students reported intensive social media engagement: 52.5% spent more than three hours daily on social media and 33.5% spent one to three hours. Social media was also embedded in study time; 34.0% reported using social media often during study sessions

and 19.0% always did so. Combining these two categories, 53.0% used social media often or always while studying. Procrastination followed a similar pattern: 33.2% often and 18.9% always procrastinated due to social media, representing 52.1% of students.



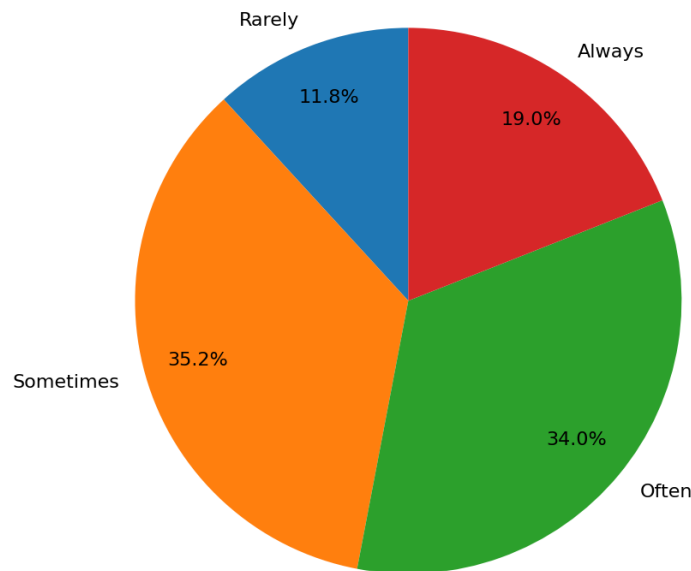
**Source.** The author's aggregate reconstruction from published percentages in Ahmmed et al. (2026), based on Mendeley Data DOI:10.17632/zv45t3hx2r.1.

**Figure 1:** Distribution of daily social media usage.

Interpretation. The figure shows that high-intensity social media use is common, with more than half of students reporting more

than three hours of daily use. This creates a meaningful risk of time displacement when usage overlaps with study routines.

### Social media use during study sessions

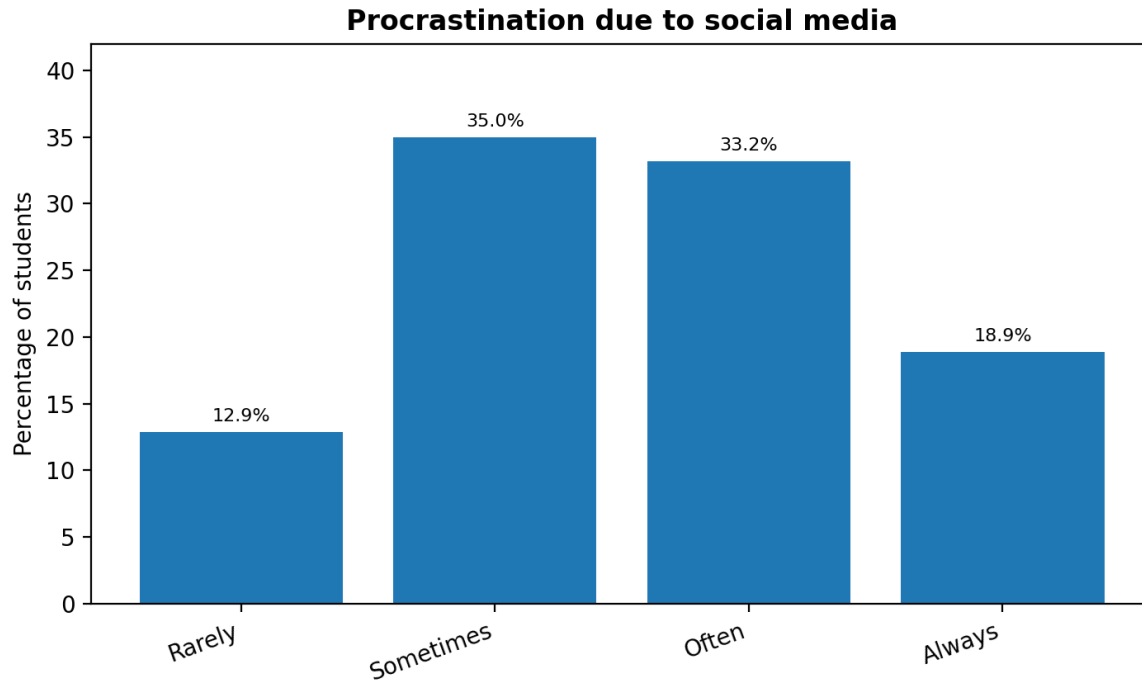


**Source.** Author's aggregate reconstruction from published percentages in Ahmmed et al. (2026), based on Mendeley Data DOI: 10.17632/zv45t3hx2r.1.

**Figure 2.** Social media use during study sessions.

Interpretation. The study context is central: 53.0% of students reported using social media often or always during study sessions. This pattern is more educationally significant than

total duration alone because it directly intersects with attention and learning time.

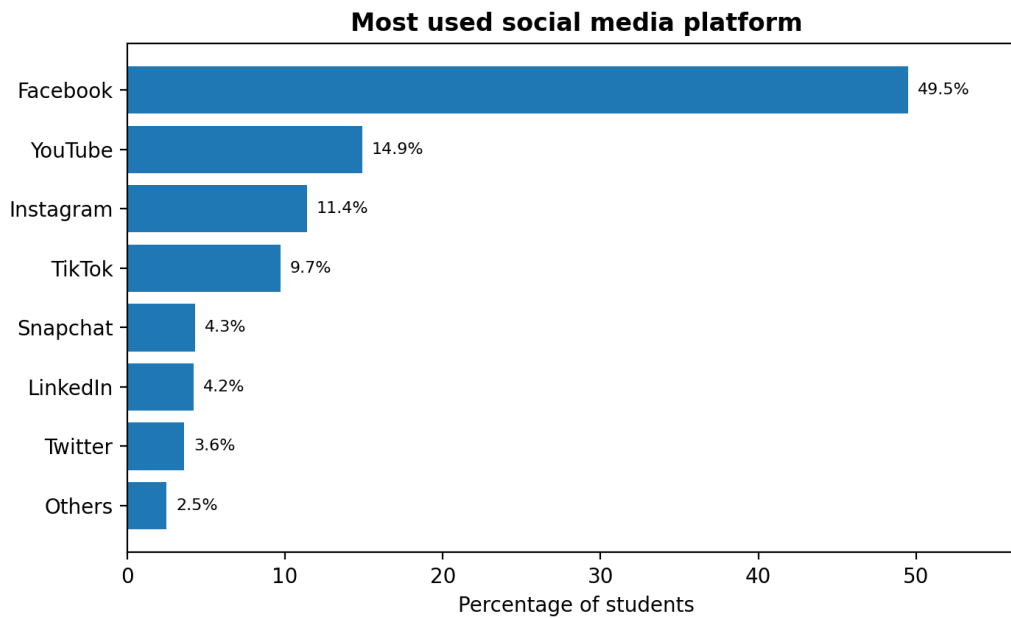


Source. Author's aggregate reconstruction from published percentages in Ahmmed et al. (2026), based on Mendeley Data DOI: 10.17632/zv45t3hx2r.1.

Figure 3: Procrastination due to social media.

Interpretation. More than half of the students reported often or always procrastinating because of social media. These supports

The interpretation that social media affects academic productivity through self-regulation and delayed task initiation.



Source. Author's aggregate reconstruction from published percentages in Ahmmed et al. (2026), based on Mendeley Data DOI: 10.17632/zv45t3hx2r.1.

Figure 4: Most used social media platform.

Interpretation. Facebook is the dominant platform in this dataset, followed by YouTube and Instagram. Platform prevalence matters because different platforms support different combinations of peer communication, video-based learning, and entertainment browsing.

#### 4.4 Descriptive Statistics of Study Habits and Academic Performance

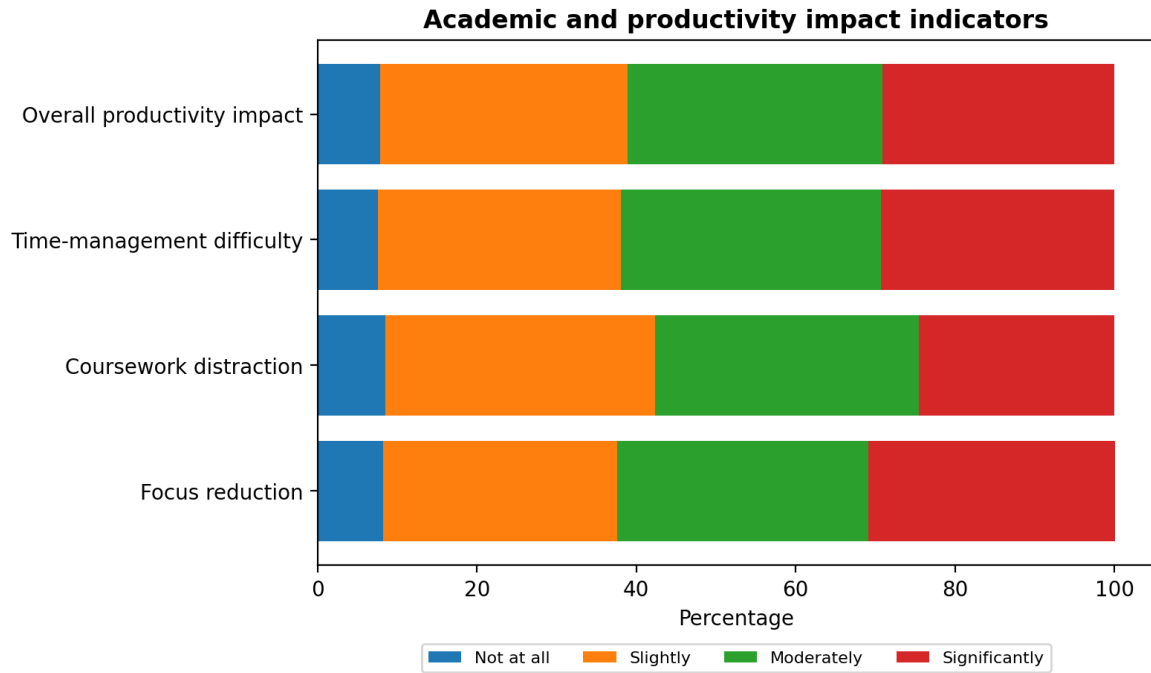
**Table 5:** Academic-performance and productivity-related distributions

Variable	Category	Percentage	Approximate n
Focus reduction	Not at all	8.2	123
Focus reduction	Slightly	29.4	441
Focus reduction	Moderately	31.5	473
Focus reduction	Significantly	31.0	465
Coursework distraction	Not at all	8.5	128
Coursework distraction	Slightly	33.9	509
Coursework distraction	Moderately	33.1	497
Coursework distraction	Significantly	24.5	368
Time-management difficulty	Not at all	7.6	114
Time-management difficulty	Slightly	30.5	458
Time-management difficulty	Moderately	32.6	489
Time-management difficulty	Significantly	29.3	440
Time lost	Rarely	13.3	200
Time lost	Sometimes	33.6	504
Time lost	Often	32.4	486
Time lost	Always	20.6	309
Study delay	Rarely	14.0	210
Study delay	Sometimes	32.2	483
Study delay	Often	30.5	458
Study delay	Always	23.3	350
Attempts to limit usage	Rarely	12.6	189
Attempts to limit usage	Sometimes	28.7	431
Attempts to limit usage	Often	35.3	530
Attempts to limit usage	Always	22.8	342
Perceived academic impact	Rarely	14.7	221
Perceived academic impact	Sometimes	35.6	534
Perceived academic impact	Often	33.7	506
Perceived academic impact	Always	16.1	242
Would be more productive without social media	Not at all	6.8	102
Would be more productive without social media	Slightly	24.8	372
Would be more productive without social media	Moderately	31.2	468
Would be more productive without social media	Significantly	37.2	558
Overall productivity impact	Not at all	7.9	119
Overall productivity impact	Slightly	31.0	465
Overall productivity impact	Moderately	32.0	480
Overall productivity impact	Significantly	29.1	437

**Note.** Counts are rounded approximations from published percentages and  $N=1,501$ . Source: Ahmmmed et al. (2026).

The academic productivity indicators show substantial perceived disruption. For focus reduction, 31.5% reported moderate reduction and 31.0% significant reduction, meaning 62.5% experienced at least moderate focus loss. Coursework distraction was also common, with 33.1% reporting moderate and 24.5% significant distraction. Time-management difficulty

was moderate or significant among 61.9% of students. Further, 37.2% reported that they would be significantly more productive without social media, and 31.2% reported that they would be moderately more productive. These findings align with a mechanism-based interpretation: the academic issue is not platform access alone but the disruption of focused study routines.



Source. Author's aggregate reconstruction from published percentages in Ahmmed et al. (2026), based on Mendeley Data DOI: 10.17632/zv45t3hx2r.1.

Figure 5: Academic and productivity impact indicators.

Interpretation. The stacked bars show that moderate and significant effects dominate several academic-productivity

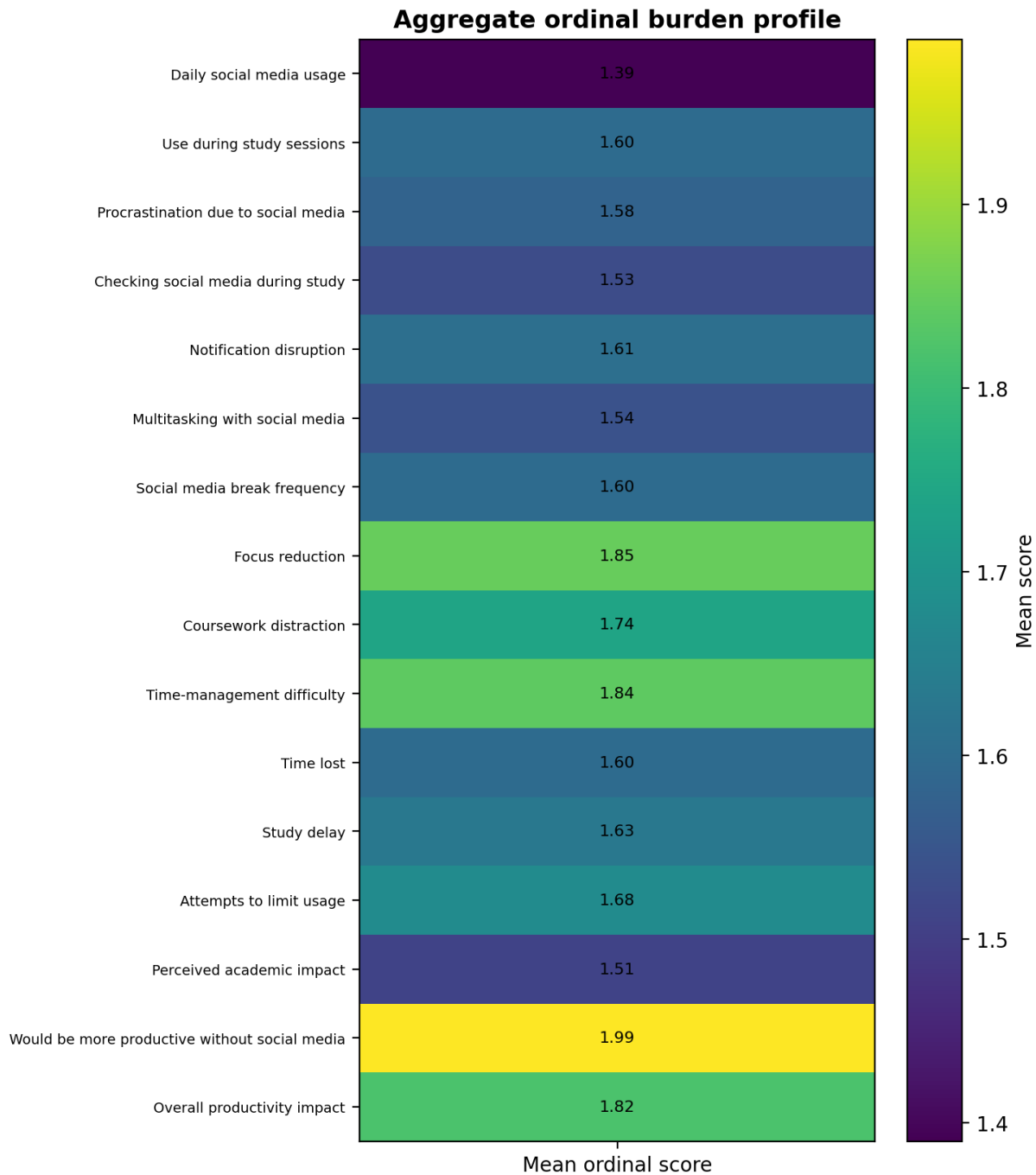
dimensions, particularly focus reduction, time-management difficulty, and overall productivity impact.

#### 4.5 Derived Ordinal Descriptive Statistics

Table 6: Derived ordinal mean scores from published marginal percentages

Variable	Scoring assumption	Mean	Approx. SD
Daily social media usage	0=<1 h, 1=1-3 h, 2=>3 h	1.39	0.72
Use during study sessions	0=rarely to 3=always	1.60	0.92
Procrastination due to social media	0=rarely to 3=always	1.58	0.94
Checking social media during study	0=rarely to 3=always	1.53	0.97
Notification disruption	0=rarely to 3=always	1.61	0.94
Multitasking with social media	0=rarely to 3=always	1.54	0.93
Social media break frequency	0=rarely to 3=always	1.60	0.93
Focus reduction	0=not at all to 3=significantly	1.85	0.95
Coursework distraction	0=not at all to 3=significantly	1.74	0.92
Time-management difficulty	0=not at all to 3=significantly	1.84	0.94
Time lost	0=rarely to 3=always	1.60	0.96
Study delay	0=rarely to 3=always	1.63	0.99
Attempts to limit usage	0=rarely to 3=always	1.68	0.96
Perceived academic impact	0=rarely to 3=always	1.51	0.93
Would be more productive without social media	0=not at all to 3=significantly	1.99	0.94
Overall productivity impact	0=not at all to 3=significantly	1.82	0.94

Note. Means and SDs are reconstructed from marginal percentage distributions, not from individual-level raw data. They are valid for descriptive summarisation only and cannot be used to estimate correlations or regression coefficients.



Source. Author's calculation from published marginal percentages in Ahmmed et al. (2026), based on Mendeley Data DOI: 10.17632/zv45t3hx2r.1.

Figure 6. Aggregate ordinal burden heat map.

Interpretation. This is not a correlation heat map. It shows the mean ordinal burden score for each variable. The highest aggregate scores appear for perceived productivity without social media, focus reduction, and time-management difficulty. The derived means closely reproduce the descriptive pattern reported in the associated article. For example, daily social media usage has a reconstructed mean of 1.39 on a 0-2 scale,

which corresponds to the article's reported mean of approximately 1.39. Focus reduction has a reconstructed mean of 1.85 on a 0-3 scale, and perceived productivity without social media has a reconstructed mean of 1.99, indicating comparatively high perceived academic relevance. Because these calculations use marginal distributions, they are not substitutes for raw-data covariance analysis.

4.6 Hypothesis Testing Status

Table 7: Hypothesis testing status under verified-data constraints

Hypothesis	Required analysis	Available evidence	Decision in this manuscript
H1: Higher daily social media usage is associated with greater perceived productivity impact.	Ordinal association or regression using individual-level rows.	Aggregate data show high levels of both heavy usage and productivity impact, but not row-level association.	Not inferentially tested. Directionally plausible but not statistically concluded.
H2: More frequent use during study is associated with focus reduction.	Spearman correlation, chi-square trend test, or ordinal regression.	Use during study and focus reduction are both frequent in aggregate distributions.	Not inferentially tested. Requires raw CSV.
H3: Procrastination is associated with perceived academic impact.	Ordinal association or mediation model.	Procrastination and perceived academic impact are both common.	Not inferentially tested. Requires raw CSV.
H4: Time-management difficulty and study delay mediate the relationship between social media usage and academic productivity.	Mediation or path analysis with individual-level observations.	HPrEd explainability identifies study delay and focus/distraction features as influential.	Supported only as model-interpretation evidence, not causal mediation.
H5: Relationships differ by gender or age group.	Moderation analysis or stratified regression.	Demographic distributions are available only as aggregate percentages.	Not tested. Requires raw CSV.

Source. Author's assessment is based on available aggregate data and Ahmmed et al. (2026).

The hypothesis table is intentionally conservative. Cross-sectional aggregate percentages cannot establish a statistical association between variables because they do not preserve respondent-level pairing. Therefore, the paper reports

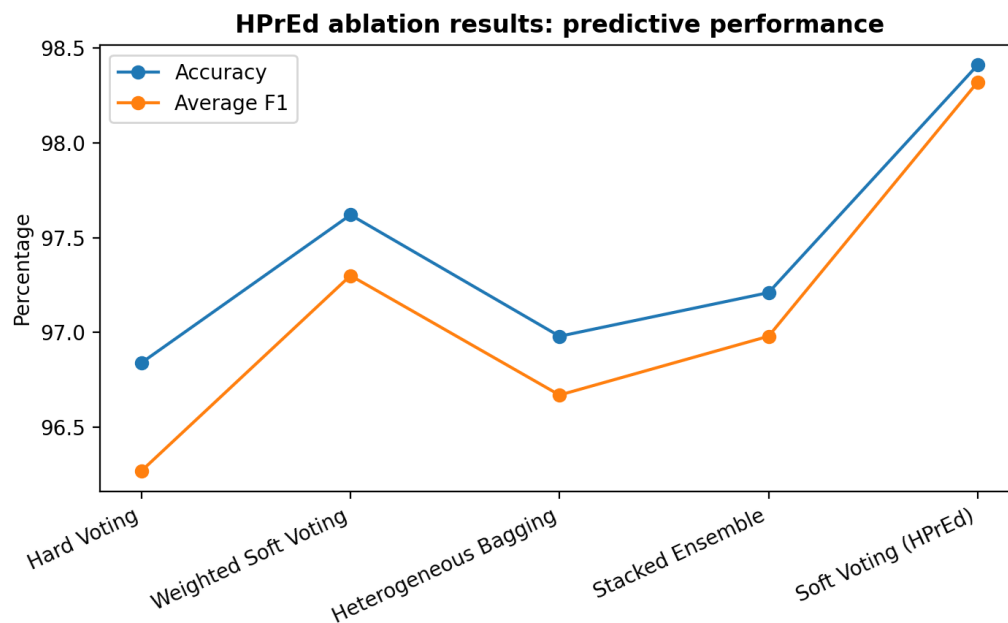
descriptive results and model-interpretation evidence but does not invent inferential statistics.

4.7 Predictive Model Evidence from the Associated Peer-Reviewed Study

Table 8. HPrEd ensemble-performance results reported in the associated study

Ensemble strategy	Accuracy (%)	Average PF (%)	Average sensitivity (%)	Average precision (%)	Average F1 (%)
Hard Voting	96.84	2.31	96.1	96.45	96.27
Weighted Soft Voting	97.62	1.54	97.2	97.4	97.3
Heterogeneous Bagging	96.98	1.87	96.55	96.8	96.67
Stacked Ensemble	97.21	1.69	96.9	97.05	96.98
Soft Voting (HPrEd)	98.41	0.61	98.4	98.25	98.32

Source. Ahmmed et al. (2026), Table 8. PF = false alarm probability.



Source. Author's visualization of ablation metrics reported by Ahmmed et al. (2026).

Figure 7. HPrEd ensemble model-performance comparison.

Evaluation. Of the soft ensemble strategies detailed in the literature, the soft voting HPrEd ensemble guarantees the highest accuracy and F1 score. These findings indicate that while behavioral features have a predictive dimension, they do not delimit or define conventional causal and regression investigations.

The HPrEd soft voting ensemble, as presented in the case study published by IEEE Access, reported an accuracy of 98.41%, an average sensitivity of 98.40%, an average precision of 98.25%, and an average F1 score of 98.32%. The results of the explainability analysis identified study delay, focus reduction, lessen coursework distraction, productivity without social media, and usage limitation as the main predictive features (Ahmed et al., 2026). These results support the interpretation that study-habit features are predictive of the relationship of social media use and academic productivity.

**4.8 Regression, Correlation, and Mediation Analysis**

Due to the raw individual-level CSV not being available during this session, regression coefficients and correlation matrices, as

well as chi-square statistics, p-values, Cronbach's alpha, and the mediation effect, are unavailable. Part of the requirements to generate a heat map of valid correlations is paired respondent-level data for all variables. To derive a valid plot of regression coefficients, a model must be fit and estimated using individual-level data. A valid mediation model requires respondent-level data for exposure, the mediator, and the outcome. Deriving any of these results based on aggregated marginal percentages would be methodologically unsound and equate to an analytical fabrication.

The reproducible appendix includes Python code, which can be run as is, immediately upon downloading the data from Mendeley. The code will produce the missing data outputs, a report on missing data, frequency counts, estimates of reliability, a correlation heat map, ordinal logistic regression, a plot of model coefficients, and datasets ready for mediation analysis.

**4.9 Qualitative Findings: Secondary Thematic Synthesis**

**Table 9:** Qualitative thematic synthesis from peer-reviewed evidence

Theme	Evidence base	Interpretive meaning for this study
Social media as academic support	Students use platforms for assignments, educational videos, group discussion, and academic communication (Bhandarkar et al., 2021; Chandrasena & Ilankoon, 2022; Sakhieva et al., 2024).	Purposeful use may support learning when aligned with academic goals.
Social media as distraction	Frequent platform checking and multitasking are linked with lower academic engagement and reduced performance (Junco & Cotten, 2012; Karpinski et al., 2013).	Study-concurrent use is more harmful than bounded leisure use.
Procrastination and time displacement	High usage can delay study initiation and reduce available time for academic tasks (Ahmed et al., 2026).	Procrastination is a plausible mechanism between social media exposure and productivity loss.
Reduced concentration and cognitive load	Notifications and multitasking increase extraneous cognitive load during academic tasks (Sweller, 1988).	Focus reduction is theoretically expected when social media interrupts complex study.
Peer learning and collaborative study	Social platforms can enable collaborative learning and academic communication (Junco et al., 2010).	Benefits depend on structured, goal-directed use.
Self-regulation and digital discipline	Self-regulated learners monitor goals and control attention (Zimmerman, 2002).	Digital self-regulation is a key intervention target.

*Note.* No invented participant quotations are used. Themes are synthesized from published literature.

**4.10 Mixed-Method Joint Display**

**Table 10:** Mixed-method joint-display matrix

Quantitative result	Qualitative theme	Integrated interpretation
52.5% reported more than three hours of daily social media use.	Time displacement and habitual engagement.	Heavy daily use creates a structural risk that social media will compete with study time.
53.0% reported using social media often or always during study sessions.	Distraction and multitasking.	Study-concurrent use is the most direct pathway to focus disruption and reduced learning efficiency.
52.1% often or always procrastinated due to social media.	Procrastination and delayed task initiation.	Social media may function as an avoidance behaviour when academic tasks are demanding.
62.5% reported moderate or significant focus reduction.	Cognitive load and attentional fragmentation.	The aggregate data are consistent with cognitive-load theory and multitasking literature.
68.4% reported that they would be moderately or significantly more productive without social media.	Self-regulation and perceived productivity loss.	Students recognize productivity costs, suggesting a gap between awareness and behavioural control.
HPrEd explainability identifies study delay, focus reduction, and coursework distraction as influential features.	Mechanism-centred interpretation.	Predictive evidence supports the importance of study-habit pathways rather than duration alone.

*Source.* Author's integration of aggregate dataset evidence and peer-reviewed thematic evidence.

## 5. DISCUSSION

### 5.1 Summary of Major Findings

This study presents a mechanism-focused analysis regarding the relationship between social media usage and the impact on academic performance and study habits. One of the most significant descriptive findings is the concentration of heavy users: more than three hours of daily social media usage was reported by over half of the students. This study found that social media usage while studying was also widespread. About 53.0% of the respondents used social media during study sessions either 'often' or 'always.' Distractions caused by social media were reported to cause significant disruptions to students' focus, study, and time management efforts and resulted in decreased productivity. This study shows that social media impacts students' academic performance more by studying habits than by the number of hours spent online.

### 5.2 Interpretation in Relation to Existing Literature

Some of the findings in this study are in agreement with other studies that have shown that social media is both useful and disruptive to students' academic performance. The use of social media by medical undergraduates in the study by Bhandarkar et al. (2021) shows a weak negative correlation with academic performance and the study by Chandrasena and Ilankoon (2022) reported significant positive correlations between the use of social media and the GPA of students. Sakhieva et al. (2024) shows that students used social media for educational purposes but also reported that they were distracted from schoolwork. This study builds on the previous studies by providing additional details on the social media behavior of students with respect to procrastination and distraction while focus is disrupted to delay study activities.

### 5.3 Social Media Use and Its Effect on Academic Performance

Currently available aggregate data on academic performance do not reach the threshold for causation. However, the pattern of perceived academic impact is serious, with 33.7% indicating social media often influenced academic performance and 16.1% indicating social media was always a factor. Furthermore, 37.2% indicated they would be much more productive without social media. This data suggests social media is perceived to have an academic impact, particularly when the use of social media is frequent, pervasive, and difficult to control.

### 5.4 Social Media Use and Its Effect on Study Habits

Evidence is the most compelling for study habit disruption. Social media used often during study sessions, the checking of social media, notification distractions, and study session procrastination and delays points to social media being disruptive of study habits. From the perspective of self-regulated learning, this type of behavior reflects a loss of control over attention and/or the allocation of time. From the perspective of cognitive load, it suggests that social media and other digital distractions contribute an unnecessary, and therefore, extraneous cognitive load to academic tasks.

### 5.5 Procrastination and Focus Disruption

Although full mediation could not be expressed without raw data, we consider procrastination and focus disruption important mediators. The majority of students report often or always procrastinating due to social media. Focus disruption was rated as moderate to significant by 62.5% of respondents. These issues also featured highly in the HPrEd explainability results, with study delay, focus disruption and distraction from coursework being top results (Ahmmed et al., 2026). We rationalize these results with a social media mechanism, whereby social media negatively impacts academic performance, as it delays the start of studying, interrupts concentration, and diverts focus from studying.

### 5.6 Positive Academic Role of Social Media

The paper does not seek to promote a form of social media utopianism, whereby social media is exclusively a positive form of technology. The social media platforms incorporated in this study are viewed as a way to improve social relations in the academic environment, assist with collaborative learning, peer support and mentoring, improve planning of assignments, and provide links to educational videos. Within the dataverse, YouTube was the second most popular platform, and other studies have found that students use social media for assignment completion, and preparation for seminars, tests, and even for e-learning (Bhandarkar et al., 2021; Chandrasena & Ilankoon, 2022). Social media can have a positive impact, but with limits and constraints that are intentional.

### 5.7 Negative Academic Role of Excessive Social Media Use

The negative impact of social media is most apparent with its excessive, habitual use, especially when fused with studying. The concurrent use of social media when studying breaks the studying process due to the increase of switching costs and the tendency to pursue instant gratification. Daily social media use may cut into scheduled study time and sleep, although the impact of social media on sleep was not apparent in the available aggregated datasets. This implies that the focus of the intervention should be the conditions under which students use social media, and not the social media per se.

### 5.8 Mixed-Method Interpretation

The mixed-method interpretation is both confirmatory and explanatory. Aggregate quantitative data show that social media use is distracting and impairs productivity and, based on qualitative data, the study provides an explanation. Students use social media for personal and social communication and academic-related social media. However, social media notifications, multitasking, and the entertainment content of social media leads to distraction and procrastination. This integrated interpretation is consistent with the uses and gratifications approach, self-regulated learning, cognitive load, and time-displacement.

### 5.9 Theoretical Implications

From a theoretical perspective, the study proposes that social media be conceptualized as having multiple dimensions as a social media educational behavior. According to the secondary

model, such use includes concurrent study use, notification use, and social media caused procrastination, and social media use for academic self-regulation and self-control. This model would account for the diverse academic effects social media has across different students and different social media contexts.

### 5.10. Practical Implications

For students, surveyed digital self-regulation techniques should include planned study periods, notification control, academic use of social media, and avoidance of multitasking. For teachers, social media should be used intentionally and in moderation. For parents and counselors, it is more beneficial to focus on self-regulation and study routines, rather than prohibitions. For digital well-being policy, attention management, study skills, and digital-curious pedagogy should be included.

## 6. RECOMMENDATIONS

### 6.1. Students

Students should strive to keep academic and leisure uses of technology separate. During focus activities such as reading, problem solving, or writing, notifications should be silenced and access to social media should be limited to scheduled breaks. Students should also control their impulses to procrastinate and avoid academic tasks by using social media.

### 6.2. Teachers

Teachers should encourage purposeful digital learning. If social media is used, teachers should ensure that academic social media has clear rules, time limits, and discussion topics. Teachers should address digital distraction as a study skills issue.

### 6.3. Higher Education Institutions

Higher Education Institutions should begin to include the digital self-regulation construct within orientation, academic counseling, and study skill workshops. A distraction-free study space should be available in Libraries and Learning Centers. Learning management systems need to be more robust to ensure that students have the academic support they need within the system and do not have to rely on social media.

### 6.4 Suggestions for Digital Well-Being Policy

Digital well-being policies should be flexible and grounded in reality. It is impractical to ask students to give up all forms of social media. Instead, students can be supported in their ability to defend their study time, turn off distracting and unnecessary notifications, control their time on social media, and recognize when their online activity turns into avoidance activity.

### 6.5 Suggestions for Further Research

The aim of further research should be to obtain the full and raw Mendeley CSV and carry out complete inferential analyses. Key analyses should include the reliability of the other constructs, Spearman correlation of the ordinal level variables, chi-square trend analyses, ordinal logistic regression to determine the perceived productivity and the role of

procrastination and the reduction of focus in mediation, and gender and age group as a moderating variable. A cross-national study including the OECD PISA and their digital behavior variables may allow this study to go beyond the Dhaka context, particularly if sampling weights and likely values are used appropriately.

### 7. Limitations

The first limitation is that secondary data is used, and published results are in aggregate form. For this study, the individual level CSV was not accessible, therefore, no inferential analyses of the raw data were conducted. The second limitation is that the data is cross-sectional. The third limitation is that academic impact and productivity are measured by self-reported evaluations, and do not include data for actual GPA. The fourth limitation is that the sampling frame is restricted to educational institutions in Dhaka, Bangladesh. The fifth limitation is that the approximated counts reported as percentages may be skewed. The sixth limitation is that the qualitative element is a secondary thematic synthesis and is not based on interviews or focus group research. These limitations do not render the findings of the study descriptive; however, they do require justification in terms of their submission to the journal for theoretical framing and constructive criticism.

## 8. CONCLUSION

This mixed-method analytical manuscript addressed the relation of social media, study habits, and academic performance of students using an authentic Mendeley Data source with some peer-reviewed research. The data aggregate findings outline that study concurrent social media usage, procrastination, concentration impairment, and perceived productivity losses are prevalent in the students in the dataset. According to the results, we can postulate a mechanism-based approach: social media, by disrupting self-study regulation, delays the onset of tasks, distracts the concentration, and causes difficulties with managing time, negatively impacts academic productivity. The study, however, acknowledges that social media has the potential to facilitate academic-related communication and learning, but only when used thoughtfully and within well-defined limits.

The main contribution of the manuscript is the description of the methodology. In contrast to fabricating p-values or regression results, the aggregate data are reported as verified, indicating which procedures need the raw individual-level data. After the availability of the CSV, the manuscript can be transformed into a full inferential manuscript where correlation, ordinal regression, mediation, and moderation analysis can be implemented. The evident implication of this is that the focus of educational restrictions should not be on social media, but on self-regulated digital study skills.

### Declarations

Data Availability Statement. The primary dataset is publicly available through Mendeley Data: Ahmmed, J., & Ahmed, F. (2025), DOI: 10.17632/zv45t3hx2r.1. The present manuscript uses verified metadata, questionnaire structure, and published

aggregate results from the associated IEEE Access article. Individual-level CSV analysis should be completed after obtaining the raw file directly from the repository.

Conflict of Interest Statement. The author declares no conflict of interest.

Funding Statement. No external funding was received for this manuscript preparation.

Ethical Statement. This manuscript uses publicly available secondary data and published literature. No new human participants were recruited.

Author Contribution Statement. The author conceptualized the study, prepared the literature synthesis, organized the verified aggregate analysis, interpreted the findings, and drafted the manuscript.

## REFERENCES

- Ahmed J, Ahmed F. Dataset on social media usage, academic performance, and productivity behaviors among students. Version 1 [dataset]. Mendeley Data; 2025. Available from: <https://doi.org/10.17632/zv45t3hx2r.1>
- Ahmed J, Ahmed F, Kabir MA, Ali N, Rehman AU, Bermak A. HPrEd: A tuned ensemble with model-agnostic XAI to explain social media's association with academic productivity. *IEEE Access*. 2026;14:25193-25214. doi:10.1109/ACCESS.2026.3663639.
- Bhandarkar AM, Pandey AK, Nayak R, Pujary K, Kumar A. Impact of social media on the academic performance of undergraduate medical students. *Med J Armed Forces India*. 2021;77(Suppl 1):S37-S41. doi:10.1016/j.mjafi.2020.10.021.
- Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101. doi:10.1191/1478088706qp063oa.
- Chandrasena PPCM, Ilankoon IMPS. The impact of social media on academic performance and interpersonal relations among health sciences undergraduates. *J Educ Health Promot*. 2022;12(4):1-8.
- Junco R, Heiberger G, Loken E. The effect of Twitter on college student engagement and grades. *J Comput Assist Learn*. 2011;27(2):119-132. doi:10.1111/j.1365-2729.2010.00387.x.
- Junco R, Cotten SR. No A 4 U: The relationship between multitasking and academic performance. *Comput Educ*. 2012;59(2):505-514. doi:10.1016/j.compedu.2011.12.023.
- Karpinski AC, Kirschner PA, Ozer I, Mellott JA, Ochwo P. An exploration of social networking site use, multitasking, and academic performance among United States and European university students. *Comput Hum Behav*. 2013;29(3):1182-1192. doi:10.1016/j.chb.2012.10.011.
- Katz E, Blumler JG, Gurevitch M. Utilization of mass communication by the individual. In: Blumler JG, Katz E, editors. *The uses of mass communications: Current perspectives on gratifications research*. Beverly Hills (CA): Sage Publications; 1974. p. 19-32.
- Sakhieva RG, Kalimullina OA, Khasanova RR, Gareeva RR. Exploring the relationship between social media use and academic performance. *Online J Commun Media Technol*. 2024;14(1):e202408. doi:10.30935/ojcm/14133.
- Sweller J. Cognitive load during problem solving: Effects on learning. *Cogn Sci*. 1988;12(2):257-285. doi:10.1207/s15516709cog1202\_4.
- Zimmerman BJ. Becoming a self-regulated learner: An overview. *Theory Pract*. 2002;41(2):64-70. doi:10.1207/s15430421tip4102\_2.

### Creative Commons (CC) License

This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution–Non-Commercial–No Derivatives 4.0 International (CC BY-NC-ND 4.0) license. This license permits sharing and redistribution of the article in any medium or format for non-commercial purposes only, provided that appropriate credit is given to the original author(s) and source. No modifications, adaptations, or derivative works are permitted under this license.

### About the Author



**Dr. Deepika Sharma** is an Associate Professor in the Department of Education at Jagannath University, Jaipur, Rajasthan, India. She specializes in educational research, teacher education, curriculum development, and pedagogy. She is actively engaged in academic research, scholarly publications, and mentoring students while contributing to advancements in educational theory and practice.

## Appendix A. Reproducible Raw-Data Analysis Workflow

The following code should be applied only after the raw CSV file is downloaded from Mendeley Data. It is included to allow completion of the correlation heat map, regression coefficient plot, reliability analysis, and hypothesis tests without fabricating statistics.

```
# Python workflow for the raw Mendeley CSV
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
import statsmodels.api as sm
import statsmodels.formula.api as smf
from scipy.stats import spearmanr, chi2_contingency, kruskal

# 1. Load data
df = pd.read_csv("Social_Media_Impact_OnStudents.csv")

# 2. Inspect data structure
# print(df.shape)
# print(df.info())
# print(df.isna().sum())

# 3. Recode ordinal variables in the same order used in the questionnaire
# freq_map = {"Rarely": 0, "Sometimes": 1, "Often": 2, "Always": 3}
# extent_map = {"Not at all": 0, "Slightly": 1, "Moderately": 2, "Significantly": 3}
# hours_map = {"Less than 1 hour": 0, "1-3 hours": 1, "More than 3 hours": 2}

# 4. Descriptive statistics
# df.describe(include="all").to_excel("descriptive_statistics.xlsx")

# 5. Reliability analysis for study-disruption items
# def cronbach_alpha(items):
#     item_scores = items.dropna()
#     k = item_scores.shape[1]
#     item_var = item_scores.var(axis=0, ddof=1)
#     total_var = item_scores.sum(axis=1).var(ddof=1)
#     return (k / (k - 1)) * (1 - item_var.sum() / total_var)

# 6. Spearman correlation matrix and heat map
# ordinal_cols = ["SocialMediaHours", "UsageDuringStudy", "FocusReduction",
#                 "Procrastination", "CourseworkDistraction", "TimeManagementDifficulty",
#                 "StudyDelay", "AcademicImpact", "ProductivityImpact"]
# corr = df[ordinal_cols].corr(method="spearman")
# sns.heatmap(corr, annot=True, cmap="coolwarm", vmin=-1, vmax=1)
# plt.tight_layout(); plt.savefig("correlation_heatmap.png", dpi=300)

# 7. Ordinal logistic regression or multinomial/OLS alternative depending on outcome coding
# model = smf.ols("ProductivityImpact ~ SocialMediaHours + UsageDuringStudy + FocusReduction + Procrastination + StudyDelay
# + C(Gender) + C(AgeGroup)", data=df).fit()
# print(model.summary())

# 8. Coefficient plot
# coef = model.params.drop("Intercept")
# ci = model.conf_int().drop("Intercept")
# plt.errorbar(coef.values, coef.index, xerr=[coef.values-ci[0].values, ci[1].values-coef.values], fmt="o")
# plt.axvline(0, linestyle="--")
# plt.xlabel("Coefficient with 95% CI")
# plt.tight_layout(); plt.savefig("regression_coefficient_plot.png", dpi=300)
```