Does the Use of Social Media Improve Academic Performance? A Study on University Graduates in a Developing Country

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Research Article

Abstract

Purpose: *The current research examines the impact of various factors, including learning engagement, psychological effects, social interaction, and changes in behavioral patterns by using social media at the tertiary level, on university students' academic performance.*
Methods: *A total of 389 students completed structured questionnaires assessing their behaviors and attitudes that impact their academic performance. Quantitative data analysis included reliability analysis and regression models to assess the magnitude of factors related to social media and their impact on key educational outcomes.*
Findings: *Academic performance is highly contingent on learning engagement, social interaction, and changes in behavioral patterns. However, the impact of psychological effects on academic results is negligible. The results suggest that social media holds promise as an auxiliary support for educational engagement when integrated thoughtfully within academic environments.*
Implications: *This study contributes to the limited body of evidence quantifying the direct educational impact of social media among Bangladeshi university students. Institutions that consider social media a learning tool should develop clear guidelines to maximize potential benefits, such as collaboration and the sharing of educational resources, while mitigating risks, including distraction and overuse.*

Keywords: Social media, academic performance, tertiary level education

1. Introduction

Social media has gained prominence over the last two decades and has fundamentally changed people's way of life (Zachos et al., 2018). Around 60 million people, representing 34.3% of Bangladesh's total population (Statista, 2025), use this medium to benefit from it. Among these users, the most active group is those aged 18-34, who use it to connect with others, share their experiences, be entertained, and build a digital identity (Siagian & Yuliana, 2023). Individuals also use this media to obtain timely information and to develop meaningful connections that support professional and personal development (Greenhow et al., 2021).

Although research on social media has gained significance across various fields, including communication, marketing, psychology, tourism, and business, scholars have recently started to investigate its impact on education, focusing on its potential to enhance learning (Purwanto et al, 2023) as well as the risks of distraction (Kircaburun et al., 2020). These platforms serve as effective instruments for learning, collaboration, and resource sharing. The integration of social media into educational contexts signifies a notable transformation in how knowledge is accessed, shared, and co-created. The media has significantly

altered student interactions with academic resources, peer connections, and communication with educators. Platforms such as Instagram, LinkedIn, YouTube, Twitter (now X), and TikTok have developed beyond their original functions of personal interaction and entertainment (Lipschultz, 2020). These platforms facilitate discussions among educators and students, enable resource sharing, recognize achievements, and promote broader intellectual exchanges (Carpenter et al., 2021). According to Manca (2020), social media has positive impacts on learning. Higher education fosters participation, engagement, reflective thinking, and collaborative learning, while also expanding learning experiences in both formal and informal contexts (Goodyear & Armour, 2021; Manca et al., 2021; Richter et al., 2022). Social media is considered essential in online learning for promoting interaction, communication, and content sharing (Hosen et al., 2021). In contrast, challenges of such media use encompass the necessity for digital literacy, the risk of encountering irrelevant content, distractions, addiction, misinformation, and technical difficulties, including internet connectivity issues. (Sánchez et al., 2019) contend that scholars should increase social media use in educational settings while also addressing challenges such as cultural resistance, pedagogical concerns, and institutional constraints.

Following the COVID-19 pandemic, social media adoption among individuals has increased for non-educational and personal purposes. Among them, Generation Z represents one of the largest demographics of social media users worldwide. They devote significant time to platforms such as Instagram, Snapchat, TikTok, and Twitter, which serve as crucial channels for connecting with peers, interacting with brands and celebrities, and expressing their social and political views. These developments signify not only alterations in communication but also significant social and cultural transformations. Moreover, educational institutions began using various social media to inform, communicate, and disseminate necessary information to their students. Researchers are highly motivated to answer the research question, "Does the use of social media improve academic performance?" The objective of the research is to gain insights into how social media can positively impact the academic performance of Generation Z students in higher education and the implications for various aspects of their lives

The contributions of this study are threefold. Firstly, previous studies in the social media literature revealed that increased social engagement on social media may lead to higher student engagement, and behavioral engagement is associated with higher grades among medical students. However, how learning engagement can enhance academic performance remains unfolded for business graduates. Additionally, face-to-face social interaction may lead to good academic outcomes, as explored by Chen and Bryer (2012). Nevertheless, how social interaction using social media can enhance academic performance can contribute to the literature. Finally, this study contributes to the social media literature by drawing on a sample of Bangladeshi students. Most previous literature has examined the impact of learning engagement (LE), social interactions (SI), psychological effect (PE), and behavioral pattern (BP) on academic performance separately. The model developed in this study, incorporating all variables, aims to explore its impact on academic performance. To address the research gap, the study aims to explore the positive impact of social media on undergraduate students' academic excellence.

2. Literature Review and Hypothesis Development

2.1 Use of Social Media

According to Agyapong and Yuan (2022), social media is conceptualized as a "group of applications which operate on the internet, Web 2.0, and allow for the exchange of information among the users". Social media is increasingly integrated into education, with students and educators interacting on platforms such as YouTube, Facebook, Instagram, and LinkedIn. These platforms allow for viewing educational content, participation in study groups, and sharing academic resources. YouTube, for example, is often used for

instructional videos and lectures, while Facebook and Instagram facilitate collaboration and social connections with classmates. LinkedIn is a platform for professional networking and career development, particularly in academic circles. Integrating social media into education enhances learning by offering a diverse range of resources and enabling communication beyond the classroom. Researchers identified several impacts of social media on students in an educational context. The most notable among these are learning engagement, social interactions, psychological effects, and changes in behavioral patterns.

2.2 Learning Engagement

Learning engagement has appeared as an important area of interest in educational research due to its close link with academic achievement, motivation, and student retention. This concept is characterized by students' commitment to invest their energy, time, and resources in educational activities both within and outside the classroom, alongside the strategies. It refers to the approaches institutions use to boost student involvement in these activities (Kuh, 2003). Learning engagement is regarded as essential for achieving meaningful and enduring learning. It comprises multiple components, including behavioral, emotional, and cognitive engagement aspects (Fredricks et al., 2004; Hew, 2016; Wang, 2008; Woo & Reeves, 2007). Among these, behavioral engagement refers to learners' participation in activities such as attending regular classes, engaging in group discussions, and completing assignments on time. In contrast, emotional engagement refers to students' feelings and attitudes towards teachers, classmates, and even the materials used in a specific course. Meanwhile, cognitive engagement involves a commitment to learning, encompassing the application of deep learning strategies, self-regulation, and critical thinking. Various pedagogical, technological, and psychological factors influence learning engagement. Research has shown that, both in the traditional and online settings, a correlation exists between learning engagement and key academic outcomes, such as student satisfaction, performance, persistence, and a sense of belonging to a community (Wang & Degol, 2014).

2.3 Social Interaction

Social interaction plays a critical role in shaping students' educational experience and overall academic success. It is vital in influencing students' educational experiences and overall academic achievements. Social media significantly boosts social interaction among students and educators by providing ongoing opportunities for communication, collaboration, and idea sharing. This interaction goes beyond the limitations of traditional classrooms and nurtures a supportive learning atmosphere (Chen & Bryer, 2012). Greater interaction has also been associated with stronger social ties and enhanced communication abilities (Marques et al., 2013). Research by Hurst et al. (2013) shows that social interaction improves students' knowledge, literacy, critical thinking, problem-solving abilities, and networking skills. Social media platforms have facilitated students' connections with a broader array of local, national, and international peers. Additionally, they enable students to socialize within their classrooms, on campus, and in broader societal contexts. Students can form virtual connections that may eventually lead to in-person meetings. Educational theories and empirical studies emphasize the impact of social interaction on motivation, engagement, learning outcomes, and psychosocial development. Regular and meaningful interactions encourage students to remain focused, ask more questions, and engage actively in class activities (Pianta et al., 2012). When educators provide support, acknowledge efforts, and express confidence in a student's capabilities, students are inclined to pursue success (Ryan & Deci, 2000). Tailored guidance and feedback during teacher-student interactions are crucial for clarifying concepts and enhancing comprehension (Hattie, 2009). Positive interactions contribute to a classroom environment that is safe, respectful, and inclusive (Hamre & Pianta, 2001). A solid relationship between educators and learners enhances students' dedication to their education and lessens feelings of isolation (Finn & Rock, 1997).

2.4 Psychological Effect

Although social media platforms suggest new opportunities for connectivity and self-expression among students, they also introduce challenges that adversely affect their mental well-being. Empirical research on social media reveals both the negative and positive psychological effects of social media use among students. Positive effects encompass increased motivation and reduced anxiety due to peer support (Rosen et al., 2013). However, excessive use of social media can result in anxiety and stress, particularly when students struggle to stabilize academic responsibilities with social media engagement (Rosen et al., 2013). Individuals, especially students, who are using social media excessively might encounter addiction (Kuss & Griffiths, 2011), and such addictive individuals might be less engaged in physical activities and experience worse sleep quality, which could make them more vulnerable to psychological distress (Wong et al., 2020). Addiction to Facebook among teenagers and young adults is also linked to emotional and mental health issues, based on a review of 23 studies (Marino et al., 2018). Another systematic review has similarly observed a significant association between social media use and depression (Best et al., 2014; Hoare et al., 2016). Platforms like Facebook, along with other social networking sites, have emerged as significant contributors to psychological issues. Furthermore, excessive engagement with social media, gaming, texting, and mobile devices can lead to feelings of depression in individuals (Abdalla et al., 2020).

2.5 Changes in Behavioral Pattern

Social media usage patterns have a notable influence on students' learning habits and organizational skills. Regular use of the media academically is associated with better time management and organizational abilities (Junco, 2012). However, issues such as procrastination and distraction are common when students engage with social media for non-academic purposes (Kirschner & Karpinski, 2010). Structured and intentional social media use is key to promoting productive study behaviors. Social media helps students build support systems by sharing academic struggles, emotional concerns, or advice (Frison & Eggermont, 2016). Communities centered on productivity and academic success (e.g., "study influencers") inspire time management, planning, and academic ambition (Al-Rahmi et al., 2015). Adolescents often use this media for self-expression, which can contribute to confidence, identity exploration, and personal growth when supported by positive feedback (Subrahmanyam & Šmahel, 2011).

2.6 Hypothesis Development
2.6.1 Learning Engagement and Academic Performance

The incorporation of social media into the academic framework has fundamentally altered the way students interact with learning resources, fellow learners, and educators. As social media becomes more integrated into academic environments, scholars have increasingly scrutinized its influence on learning engagement and academic achievement. However, specific studies indicate favorable correlations (Çali et al., 2024), whereas others highlight potential distractions and adverse effects. The concept of learning engagement encompasses the degree of participation, interest, and commitment that students exhibit in their academic endeavors. Current research indicates that engaging with such media in the academic domain may lead to heightened student engagement (Al-rahmi et al., 2015; Pozzi et al., 2016). Students who considered social media valuable instruments exhibited higher engagement in their educational pursuits than their counterparts who did not share this perspective (Morton et al., 2019). Social networking has the potential to promote active learning, increase student engagement, and elevate learning outcomes (Mbogho, 2017). Earlier research by Çali et al. (2024) and Navarro et al. (2022) established that behavioral engagement was a major predictor of academic success. However, cognitive and emotional engagement are not. Conversely, Liu et al. (2024) found a favorable correlation between emotional involvement and intrinsic motivation in social media and academic achievement in Chinese universities. (Argyriou et al., 2022) found that among

123 psychology students, several indicators of behavioral engagement (e.g., video views, quiz completion) were strongly connected with higher final exam grades. Social media provides simple access to educational information, which is expected to improve students' academic performance. The accurate use of social media fosters collaboration among students beyond traditional classroom hours, appealing to a variety of learning styles. Consequently, effective utilization of numerous social media platforms for learning engagement results in enhanced performance. Hence, we can hypothesize:

H1: Learning engagement through social media use has a significant positive effect on students' academic performance.

2.6.2 Social Interaction and Academic Performance

Social media profoundly enriches the dynamics of student social interaction and facilitates engagement between students and educators by providing persistent channels for discourse, collaboration, and idea exchange. This engagement transcends conventional educational barriers and cultivates a nurturing learning environment (Chen & Bryer, 2012). Such enhanced interaction is associated with stronger social bonds and improved communication skills (Marques et al., 2013). The research conducted by Nadeem & Mansur (2023) with a sample of 100 undergraduates revealed a noteworthy positive correlation between peer interaction and academic performance. (Pagupat & Oco, 2025, January) further clarify this relationship by articulating the positive correlation between classroom interaction—encompassing behavior and interest—and academic performance. A case study conducted by Ali et al. (2024) revealed that constructive interactions between teachers and students have a beneficial impact on students' educational success within education faculties. All these studies established the opinion of social interaction within conventional contexts. Nevertheless, social media serves as an excellent platform for students to cultivate social interaction. In the contemporary era, digital communication and online platforms have emerged as pivotal facilitators of scholarly engagement. (Wang et al., 2012) observed that students who engaged in academic discussions within Facebook groups exhibited a deeper understanding of course material and achieved superior academic performance compared to their friends who did not participate in such discussions. Similarly, Junco (2012) found that students' Twitter use for academic purposes was associated with higher GPAs and much-improved engagement. In addition, the social and emotional support that students receive from classmates may positively impact their performance in class. (Greenhow & Lewin, 2016) state that online social engagement fosters a sense of belonging and reduces feelings of loneliness, which is especially helpful in distance learning settings. This, in turn, keeps people motivated and improves their performance. However, it is crucial to differentiate between constructive academic engagement and disruptive social media usage. (Kirschner & Karpinski, 2010) warn that non-academic engagement with online platforms such as Facebook may adversely affect performance. This indicates that the quality and intent of contact are essential factors influencing its effect on academic results. Hence, we can hypothesize that:

H2: Social interaction via social media use has a significant positive effect on students' academic performance.

2.6.3 Psychological Effect and Academic Performance

The growing prevalence of social media has profoundly transformed how students engage, acquire knowledge, and navigate their educational experiences. Although these platforms offer advantages such as opportunities for collaboration and vast access to information, they simultaneously present psychological challenges. The psychological consequences of engaging with social media, ranging from anxiety, distraction, and social comparison to support, motivation, and self-efficacy, are vital in shaping academic performance. The issue of distraction, extensively studied in psychology, is notably exacerbated by social media, leading to shorter attention spans and adversely affecting students' capacity to focus on their academic endeavors. (Junco, 2012) found a negative correlation between time spent on non-academic social media and GPA, primarily due to multitasking fatigue and procrastination. The overuse of social media has

been linked with increased anxiety, depression, and emotional turmoil, mainly stemming from phenomena such as fear of missing out, cyberbullying, and detrimental social comparisons. The presence of these psychological challenges leads to a decline in both academic motivation and performance. (Keles et al., 2020; Twenge & Campbell, 2018). On a positive note, when used persistently, social media can enrich academic motivation and promote emotional well-being. (Greenhow & Lewin, 2016) highlighted that students who use social media for peer learning, emotional support, and collaborative problem-solving cultivate a sense of belonging, which contributes to academic success. Social media creates a platform for apprentices to pursue clarification, exchange resources, and validate their understanding through peer interactions. This engagement fosters a stronger sense of academic self-efficacy, reflecting a learner's confidence in their ability to excel in scholarly endeavors. This involvement fosters a stronger sense of academic self-efficacy, reflecting an individual's confidence in their capacity to excel in academic pursuits (Yang & Brown, 2013). Supportive interactions on social media offer psychological relief, minimizing academic stress while supporting psychological well-being. Students who use social media to express stress, seek encouragement, or request assistance experience greater emotional equilibrium, thereby improving their capacity for academic concentration. The beneficial psychological impacts of social media—including heightened motivation, emotional support, engagement, and self-efficacy—can markedly enhance academic performance when used intentionally. (Best et al., 2014). Thus, we can hypothesize:

H3: Psychological effects associated with social media use significantly affect students' academic performance.

2.6.4 Changes in Behavioral Pattern and Academic Performance

The widespread adoption of social media platforms has prompted significant changes in their behavior, particularly in communication, collaboration, and engagement with their studies. A key transformation in educational practices is the transition from individual to interactive learning. Students frequently use platforms such as WhatsApp, Facebook Groups, and Telegram to share academic evidence, resolve uncertainties, and exchange learning materials. This shift aligns with constructivist learning theories, which highlight the social dimensions of knowledge acquisition. Such interactions expand access to diverse perspectives and encourage the formation of academic communities that foster mutual support and motivation (Al-Rahmi & Zeki, 2017). Despite frequent critiques regarding its adverse effects, recent studies have underscored the positive impact of social media on academic behavior and performance, mainly when used purposefully for learning, motivation, and peer support. Research by Greenhow and Lewin (2016) and Al-Rahmi and Zeki (2017) indicates that learners in educational social media communities often achieve better academic outcomes, as they tend to devote more time to their work and have access to diverse viewpoints. Social media can facilitate positive behavioral regulation, especially within organized academic settings. Platforms such as Discord and Reddit, especially study-focused subreddits, promote planning, goal-setting, and routine formation, which are associated with improved academic performance. Participation in social media study groups or communities fosters motivation through peer interactions. Students often adopt the effective habits, strategies, and productivity patterns of their peers, leading to enhanced academic practices and a stronger focus on their goals. When these behaviors are directed toward academic objectives, they can significantly boost academic achievement. Therefore, the central role of social media in education should be considered not only in terms of its potential downsides but also to enhance behavioral and academic outcomes when used effectively. Hence, we can develop a hypothesis such as:

H4: Changes in behavioral patterns due to social media use significantly affect students' academic performance.
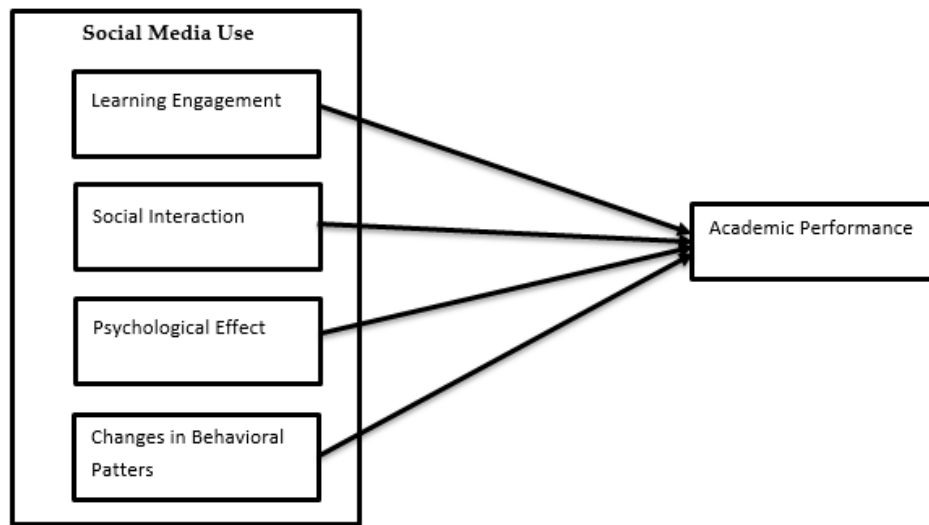
Fig. 1: Research Framework

3. Methodology

3.1 Sample and Data Collection Procedure

This study employed a quantitative research design to assess the impact of social media on tertiary-level education. The target population consisted of students from private universities in Chittagong, and a sample of 389 students was selected using convenience sampling. This approach ensured diverse representation across academic years and disciplines (Malhotra & Das, 2011), enabling a comprehensive evaluation of students' perceptions of the role of social media in their academic experience. To test the questionnaire's validity, a pilot study with 40 students was conducted. 400 questionnaires were received for the purpose, but 11 questionnaires had missing information, which made the total sample 389. According to Hair et al. (2010), a sample of 350 is sufficient to represent the total population in a study.

3.2 Survey Instrument and Item Measurement

A structured questionnaire was developed for this research following an extensive review of existing studies on how social media influences students' academic outcomes in tertiary education. The tool comprised two segments: the first collected demographic details such as gender, age, and year of study, as well as questions concerning the frequency and purpose of social media use; the second focused on statements designed to gauge students' perceptions of its effects on their learning performance. Respondents indicated their level of agreement with each statement using a 5-point Likert scale ranging from 1 = strongly agree to 5 = strongly disagree. The survey was conducted over one month during the final months of 2024, and students could complete it at their convenience to ensure consistency and comparability across responses. The questionnaire further examined several constructs connected to social media engagement, including learning participation, interpersonal interaction, psychological effects, and shifts in behavioral patterns. Learning participation was evaluated through a 5-item scale proposed by (Junco, 2012; Manca, 2020); interpersonal interaction with a 4-item scale from (Al-Rahmi & Zeki, 2017; Junco, 2012; Manca, 2020); psychological outcomes using a 4-item scale derived from (Al-Rahmi & Zeki, 2017; Frison & Eggermont, 2016) and behavioral change with a 4-item scale by (Al-Rahmi & Zeki, 2017; Manca, 2020). The dependent construct, students' academic achievement, was assessed using adapted items from Al-Rahmi & Zeki (2017), Al-Rahmi et al. (2015), and Greenhow & Lewin (2016). Minor wording adjustments were introduced to improve clarity and ensure comprehensibility for participants. Data were processed using SPSS version 26, with descriptive statistics applied to demographic and usage patterns and inferential analysis used to test the hypothesized relationships in the study.

4. Findings and Data Analysis

Tables 1 describe the demographic profile of the sample used in the study. 58.9% respondents are male, while 41.1% are female. The age range of the sample is from 18 to more than 26. The researchers received the highest response rate (71%) from respondents aged 22-26. All the respondents are students of private universities of different semesters in Chittagong city.

Table 1: Demographic data of Respondents

Characteristics	Factor	Frequency	Percentage
Age	Under 18	2	0.5
	18-21	84	21.6
	22-26	276	71.0
	Over 26	27	6.9
	Total	389	100.0
Gender	Female	160	41.1
	Male	229	58.9
	Total	389	100.0
Year of Study	Year 1	65	16.7
	Year 2	76	19.5
	Year 3	144	37.0
	Year 4	104	26.7
	Total	389	100.0

Source: Author's Survey and Calculations

Table 2 presents information on students' social media usage patterns. Most of the students (38.6%) use social media more than 5 times per day. Facebook (51.7%) and YouTube (24.2%) are the most frequently used social media sites, according to the survey. For educational purposes, the most significant reasons for students' use of social media are to get help from classmates (19.8%) and to contact classmates to discuss their academic work (19.5%).

Table 2: Respondents' data about the use of social media

Characteristics	Factor	Frequency	Percentage
Frequency of use of social media	Once a month	8	2.1
	2-3 times per month	16	4.1
	1-3 times per week	29	7.5
	Once a Day	46	11.8
	2-3 times per day	140	36.0
	Over 5 times per day	150	38.6
	Total	389	100.0
Most Frequently Used Social Media Sites	Facebook	201	51.7
	YouTube	94	24.2
	LinkedIn	13	3.3
	Twitter	4	1.0
	Instagram	43	11.1
	Other	34	8.7
	Total	389	100.0
Why do you use social media for education?	To get help from my professors	54	13.9
	To get help from my classmates	77	19.8
	To contact classmates for group discussions	60	15.4
	To submit work/assignments	68	17.5
	To contact classmates to discuss academic work	76	19.5
	Other	54	13.9
	Total	389	100.0

4.1 Reliability and Validity Analysis

In a study, reliability analysis ensures the internal consistency of the constructs used in the measurement instrument. According to Nunnally's (1978) guidelines, a scale with internal consistency should have an alpha coefficient of at least 0.60; 0.70 is often considered the benchmark (Fornell & Larcker, 1981). A Cronbach's alpha of 0.80 or higher indicates strong reliability. Table 3 presents Cronbach's alpha values for the different parameters. These results indicate that the reliability ranges from 0.625 to 0.822, suggesting that all the constructs are sufficiently reliable. Overall, these findings highlight the importance of the constructs being examined and the need for additional assessment to ensure accurate measurement (Tess, 2013). Additionally, Table 3 presents the mean and standard deviation for the variables.

Table 3: Reliability and Validity Analysis and Descriptive Statistics

Variables	No. of Items	Cronbach's Alpha	Mean	Std. Deviation
Academic Performance (AP)	6	.712	2.4375	.93245
Learning Engagement (LE)	6	.816	2.4750	.71112
Social Interaction (SI)	6	.822	2.4156	.70143
Psychological Effects (PE)	6	.674	2.5188	.63117
Changes in Behavioral Patterns (BP)	7	.625	2.7063	.86032

4.2 Correlation Analysis

Pearson's correlation coefficients among the dependent and independent variables are presented in Table 4. When two or more independent variables in a regression model are highly correlated, multicollinearity occurs, leading to unreliable coefficient estimates. The current study reveals the correlations between learning engagement (LE), social interaction (SI), psychological effect (PE)**,** and changes in behavioral pattern (BP) with academic performance (AP) ranging from moderate to strong, with values above 0.5 in many cases The highest correlation observed is between LE and SI (0.741) and PE and BP (0.660), both of which could indicate some potential for multicollinearity. However, according to Hair et al. (2010), a correlation above 0.90, and according to Kline (2015), a threshold above 0.85, typically indicates a high risk of multicollinearity. Therefore, none of the correlation values exceed this threshold, and all factors show a positive correlation.

Table 4: Pearson's Correlation Coefficients

	AP	LE	SI	PE	BP
AP	1.000				
LE	0.773	1.000			
SI	0.725	0.741	1.000		
PE	0.479	0.512	0.507	1.000	
BP	0.651	0.612	0.639	0.660	1.000

4.3 Regression Analysis

The expected results from the linear regression study are illustrated in Tables 5, 6, and 7 below. Table 5 displays the model summary and ANOVA (Analysis of Variance) results for a multiple regression analysis with Academic Performance (AP) as a dependent variable and changes in Behavioral Pattern (BP), Learning Engagement (LE), Psychological Effects (PE), and Social Interaction (SI) as the independent variables. The R value is 0.821, indicating the relationship between the actual Academic Performance (AP) values and the forecasted values from the regression model. A result of 0.821 explains a strong positive correlation between the predicted and observed values, indicating that the model effectively predicts AP. R^2, or the determination coefficient, signifies the fraction of variance in the dependent variable (AP) elucidated by the independent variables (BP, LE, PE, SI). An R^2 score of 0.674 indicates that 67.4% of the variance in AP is explained by the model, suggesting a relatively excellent fit to the data.

Table 5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	129.555	4	32.389	198.340	0.000[b]
	Residual	62.707	384	0.163		
	Total	192.262	388			
R 0.821, R Square 0.674, Adjusted R Square 0.670, Std. Error = 0.4041 Dublin Watson= 2.027						
a. Dependent Variable : AP						
b. Predictors: (Constant), BP, LE, PE, SI						

The ANOVA results for the multiple regression model assessing predictors of academic performance (AP) indicate that the model is statistically significant, $F(4, 384) = 198.340$, $p < 0.001$. Together, the predictors (BP, LE, PE, and SI) account for a substantial proportion of the variance in academic performance. Specifically, the regression sum of squares is 129.555, while the residual sum of squares is 62.707. These findings suggest that the independent variables significantly contribute to predicting academic performance, and the model effectively fits the data.

Table 7: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	0.240	0.089		2.680	0.008	0.064	0.415
	LE	0.445	0.043	0.464	10.232	0.000	0.359	0.530
	SI	0.239	0.044	0.254	5.466	0.000	0.153	0.325
	PE	-0.045	0.045	-0.040	-1.006	0.315	-0.133	0.043
	BP	0.256	0.050	0.231	5.176	0.000	0.159	0.354
a. Dependent Variable: AP								
b. Predictors: (Constant), BP, LE, PE, SI								

The variable Learning Engagement (LE) exhibits a substantial positive correlation with academic performance (AP). The unstandardized coefficient (B) for Learning Engagement is 0.445, indicating that for every one-unit increase in learning engagement, academic performance is expected to increase by 0.445 units, provided all other variables remain constant. The standardized beta (Beta) of 0.464 indicates that learning engagement has the most significant influence on academic success among all predictors. The t-value of 10.232 and the p-value of 0.000 indicate that this association is statistically significant, suggesting that increased student engagement correlates with improved academic performance. The confidence interval for Learning Engagement is [0.359, 0.530], further substantiating the robustness of this relationship. Social Interaction (SI) also has a positive and statistically significant impact on academic performance. The unstandardized coefficient (B) is 0.239, meaning that for every one-unit increase in social interaction, academic performance is expected to increase by 0.239 units, assuming all other variables remain constant. The standardized Beta value of 0.254 indicates a moderate positive effect of social interaction on academic performance. With a t-value of 5.466 and a p-value of 0.000, the effect is statistically significant. This suggests that increased social interaction is beneficial for academic performance, and students who engage in more social interactions tend to perform better academically. The confidence interval for Social Interaction is [0.153, 0.325], which further supports the positive relationship between social interaction and academic performance.

Psychological Effects (PE) have a minimal negative relationship with academic performance. The unstandardized coefficient (B) is -0.045, suggesting that for each one-unit increase in psychological effects,

academic performance is expected to decrease by 0.045 units. However, this relationship is not statistically significant, as evidenced by the t-value of -1.006 and the p-value of 0.315, which exceed the standard significance level of 0.05. Therefore, although there is a small adverse effect, it does not have a meaningful impact on academic performance in a statistical sense.

Behavioral Pattern (BP) shows a significant positive effect on Academic Performance. The unstandardized coefficient (B) for Behavioral Pattern is 0.256, indicating that for each one-unit increase in behavioral patterns, academic performance is expected to increase by 0.256 units, assuming all other variables are constant. The standardized Beta value of 0.231 suggests a moderate positive influence on academic performance. The t-value of 5.176 and the p-value of 0.000 confirm that this relationship is statistically significant, suggesting that positive behavioral patterns are associated with better academic performance. The confidence interval for Behavioral Pattern is [0.159, 0.354], which confirms the significance and positive nature of the relationship between behavioral patterns and academic performance.

Table 7: Summary of acceptance or rejection of hypotheses

Variable	Hypothesis	p-value	t-value	Conclusion
LE	H₁: Positive relationship with AP	0.000	10.232	Supported
SI	H₁: Positive relationship with AP	0.000	5.466	Supported
PE	H₁: Negative relationship with AP	0.315	-1.006	Not supported
BP	H₁: Positive relationship with AP	0.000	5.176	Supported

Source: Authors' calculation

In summary, the analysis reveals that Learning Engagement, Social Interaction, and Behavioral Patterns significantly and positively influence Academic Performance. Specifically, higher engagement in learning activities, greater social interaction, and positive behavioral patterns, such as self-discipline, are associated with better academic outcomes. However, Psychological Effects do not significantly impact academic performance. The overall regression model is statistically significant, explaining 67.4% of the variance in academic performance, indicating that the combination of these factors effectively predicts academic success.

5. Discussion and Implications

The findings of this study highlight that learning engagement, social interaction, and changes in behavioral patterns are key factors that significantly contribute to improved academic performance of undergraduate students. Students who are more engaged in their learning, have better social interactions, and demonstrate positive behavioral habits tend to perform better academically. On the other hand, psychological effects do not have a significant impact on academic performance in this context. The overall regression model explains a substantial portion of the variance in academic performance, suggesting that these factors collectively influence students' academic success.

The current study establishes a relationship between learning engagement using social media and academic performance. This implies that when students use social media for learning engagement, their understanding improves, ultimately enhancing their academic performance; i.e., H1 is accepted. This finding is consistent with studies that have documented a positive relationship between learning engagement and academic achievement (Çali et al., 2024; Mbogho, 2017; Navarro et al., 2022). This suggests that educational institutions should focus on increasing student engagement through social platforms by using interactive teaching methods, collaborative learning activities, and real-world applications of academic content. Encouraging active participation in learning can lead to better academic outcomes.

Regarding the relationship between social interaction and academic performance, our results confirm H2, indicating that social interaction positively affects graduates' academic performance. This suggests that the academic performance of graduates improves when students interact with peers, teachers, and others through social media, fostering social interaction, enhancing communication skills, and creating a sense

of community within educational institutions. This result is in line with the findings of Nadeem & Mansur (2023) and Wang et al. (2012). This finding suggests that educational institutions should promote group activities, peer learning, and collaborative projects among students to enhance social interaction and positively influence academic performance. These should also provide opportunities to engage socially both inside and outside the classroom.

On the contrary, psychological effects show a negative impact in this study (H3 rejected). This outcome aligns with the existing literature by Keles et al. (2020), Twenge & Campbell (2018), and Junco (2018), which confirms a negative correlation between psychological effects and academic outcomes. Psychological challenges arising from social media can hinder students' academic success. However, it is still important to provide support for students dealing with mental health challenges. Offering counselling services and creating a supportive academic environment by the organizations could help alleviate any negative psychological impacts that might adversely affect learning.

Further, our findings indicate that using social media to change students' behavior patterns has a positive impact on their academic performance (H4 supported). This outcome aligns with the existing literature (Lewin, 2016; Al-Rahmi & Zeki, 2017) that suggests using social media to focus more on study materials, group discussion, and career orientation may improve academic outcomes. Our findings imply that educational organizations can foster academic success by promoting positive behaviors such as self-discipline, time management, and consistent study habits. Therefore, these organizations can arrange workshops, provide training, and provide resources to help students develop these important skills.

6. Limitations and Future Direction

The study has several limitations. First, the study focused on a single type of educational institution, limiting its generalizability. If the study were conducted at both private and public universities in Bangladesh, we could generalize the results more accurately. Second, several updated tools are available to measure the relationship between independent and dependent variables. Third, we did not specify any social media; therefore, the role of specific social media could yield new findings for this study.

So, future research could explore the underlying mechanisms that connect learning engagement, social interaction, and changes in behavioral patterns to academic performance by examining the specific contexts in which these relationships are most pronounced. Additionally, research could investigate the role of Psychological Effects in different student populations, such as those with specific mental health conditions or under high academic stress, to better understand when psychological factors might influence academic outcomes. Longitudinal studies could also provide insights into the causal relationships among these variables and how they evolve. Furthermore, exploring the influence of cultural, socioeconomic, and institutional factors on these predictors would help develop a more comprehensive understanding of academic performance across diverse educational settings.

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