

The Moderated-Mediated Influence of TikTok, Facebook, and Twitter Usage Alongside Psychological Factors on Academic Achievement among Botho University Students in Botswana: Examining the Role of Self-Regulation and Personal Profile

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Abstract

The evolving digital landscape underscores the need to investigate the influence of social media on academic performance. This study examines the intricate relationship between social media use—specifically on TikTok, Facebook, and Twitter—and the academic performance of university students in Botswana. Exploring the roles of psychological traits, self-control, and individual profiles as moderators and mediators in this correlation, the research emphasizes the pivotal influence of these factors in shaping how social media impacts academic performance. The primary objective is to scrutinize both the direct and indirect effects of social media use on student performance, evaluating how self-directed regulation mechanisms can mitigate adverse effects. Employing a quantitative approach, the study analyzed survey data from 55 undergraduate students at Botho University in Botswana, recruited through convenience sampling. While the sample size was constrained by practical limitations, the study offers initial insights to be further explored in future research with larger samples. Utilizing descriptive statistics, correlation, and regression analysis, the research investigated usage patterns, perceived impacts, and self-regulation techniques. Findings reveal a robust link between extensive social media use and varied academic performance, influenced significantly by individual self-regulation skills and psychological traits. Notably, strong self-regulation techniques were associated with reduced negative academic consequences, highlighting the crucial role of human control in digital engagement. The study illuminates how social media can serve as both a distraction and a valuable teaching tool, shaped by individual characteristics. It recommends future research focus on specific interventions aimed at enhancing self-regulation abilities to maximize the educational benefits of social media while minimizing drawbacks. This research contributes to a deeper understanding of digital media's impact in educational settings, providing valuable insights for educators, policymakers, and students navigating the challenges of academic success in the digital era.

Keywords: social media, academic performance, self-regulation, psychological factors, university students

The integration of TikTok, Facebook, and Twitter into university students' lives has transformed communication, interactions, and information access, prompting research on their impact on academic achievement (Zhang, et al., 2023; Contreras, et al., 2023; Elhai et al., 2017; Kuss, et al., 2017; Adekitan, 2017). This study investigates how these platforms, alongside motivation and self-esteem, affect academic outcomes among Botho University students in Botswana, considering both benefits and concerns (Saini et al., 2023). It explores the moderated-mediated influence of social media usage and psychological factors on academic success, emphasizing self-regulation as a mediator and personal profiles as moderators, aiming to provide insights within the unique context of the Botho University population.

Social media platforms like TikTok, Facebook, and Twitter have transformed communication and social interactions, with both positive and negative impacts on academic performance (Zhang, et al., 2023; Contreras, et al., 2023). The theory of social online self-regulation (SOS-T) suggests that users' engagement with social networking sites reflects underlying self-regulatory processes (Ozimek, et al., 2021). Studies have shown varying effects of social media on academic achievement, with some indicating negative correlations (Kirschner, 2010) and others suggesting potential benefits (Junco, 2015). In southern Africa, including Botswana, university students actively use social media, mirroring global trends with regional characteristics. Concerns about social media's impact on academic performance are prevalent, with studies highlighting potential distractions and decreased study time. Cultural nuances also shape social media usage patterns among university students in Botswana (Odendaal, et al., 2019).

Excessive social media use can hinder academic performance, especially among students with lower self-regulation skills (Radzitskaya, et al., 2024; Arijenywa, 2023). However, strategic use can support learning and facilitate access to educational resources. Motivation, attention, and self-esteem significantly influence students' academic success (Pintrich, et al., 2002; Duckworth, et al., 2005). Saini, et al., (2023) highlight both the positive advancements and challenges of social media in education, such as enhanced global connectivity and potential distractions. They emphasize the need for a balanced approach to integrating social media into educational contexts while promoting academic integrity and productivity. The impact of social networking site (SNS) use on academic achievement is complex, with the moderated-mediated model introduced by the Social Online Self-Regulation Theory (SOS-T) highlighting the importance of individual differences in self-regulation and personal profiles in determining the influence of SNS use on academic outcomes.

Self-regulation, as defined by the Social Online Self-Regulation Theory (SOS-T), encompasses users' abilities to manage their online behaviors driven by specific motivational states, such as the need for self-presentation and social connection (Ozimek, et al., 2021; Tedeschi, et al., 1981; Krämer, et al., 2008). Materialism and narcissism significantly influence SNS usage patterns, with materialistic users frequently showcasing possessions and vulnerable narcissists seeking external validation (Ozimek et al., 2017; Ozimek et al., 2018).

In the context of social media usage and academic achievement, self-regulation plays a pivotal role in managing distractions and cognitive processes, potentially mediating the relationship between engagement, psychological factors, and outcomes (Vohs, et al., 2016). Students with strong self-regulation skills can effectively manage their time, limit distractions, and maintain focus, leading to better academic performance (Perales, et al., 2020). Conversely, those with lower self-regulation may experience decreased performance due to increased distraction and time spent on SNS (Andrade, 2021; Heravi et al., 2018).

Personal profiles, encompassing individual characteristics, traits, and experiences, moderate the impact of social media engagement and psychological factors on academic achievement (Bandura, 1997). Motivation, attention, and self-esteem are critical psychological determinants shaping students' academic success (Pintrich, et al., 2002; Duckworth, et al., 2005).

The theoretical framework of this study is anchored in Vygotsky's Social Development Theory (SDT), McCombs' Time Displacement Theory (TDT), and Blumler and Katz's Uses and Gratification Theory (U>). SDT emphasizes the crucial role of social interactions in cognitive development (Vygotsky, 1978), suggesting that social media platforms could significantly influence learning processes. TDT provides a perspective on the potential trade-offs between time spent on social media and academic pursuits (McCombs, 1972), while U> offers insights into the motivations and gratifications driving social media usage (Blumler, et al., 1974). These theories collectively form the foundation for examining the complex interplay between social media engagement, psychological factors, and academic achievement in this study.

By exploring these interactions, the research seeks to unravel the complex tapestry of digital engagement, psychological well-being, and educational success among Botswana's university students, aiming to harness social media's potential for fostering academic achievement while mitigating its distractions and negative impacts.

METHODOLOGY

Research Design

This study adopted a quantitative research design to examine the relationships among social media use, psychological factors, academic achievement, and the roles of self-regulation and personal profiles among university students in Botswana. The quantitative approach facilitated the collection of numerical data for statistical analysis, enabling the investigation of patterns, correlations, and potential causal relationships.

Population and Sampling Techniques

The study employed convenience sampling to conveniently select university students from Botho University in Botswana. This method was chosen to gather a sample without specific emphasis on academic disciplines or demographic backgrounds, ensuring representation across a diverse range of students. A total of 55 participants took part in the study, comprising 26 males and 29 females. Regarding the participants' highest educational qualifications, 25 held certificates, 20 possessed diplomas, and 10 had undergraduate degrees. Concerning age distribution, the majority of respondents ($n=25$; 45.4%) fell within the 18-21 age bracket, followed by 23 students (41.8%) in the 22-24 age range, with the fewest respondents ($n=7$; 12.7%) falling within the 25-29 age bracket. Regarding socioeconomic status, 12 participants hailed from low-income households, 29 from middle-income households, 10 from high-income households, and only four from very high-income households, respectively.

Participants were required to be enrolled full-time at Botho University in Botswana, aged between 18 and 30 years, and actively using at least one of the specified social media platforms (TikTok, Facebook, and Twitter).

Data Gathering Procedures

This section outlines the stringent data gathering procedures involving research clearances and the data collection process.

The research underwent thorough clearance processes, inclusive of institutional clearances and obtaining permits from Botho University. The University's Ethics Review Board (ERB) granted approval for the

study at the institutional level. Additionally, ethical clearance from the Ministry of Education and Skills Development (MOESD) was sought for conducting research in Botswana, ensuring compliance with national regulations. The MOESD issues the national annual research permit and mandates ethical clearance from relevant ethical review boards across the country.

Despite obtaining clearances from the Ministry, access to the university necessitated permission from the Vice Chancellor. Copies of ethical clearances and permits were forwarded to them for verification. The Co-Principal Investigators (co-PIs), primarily university lecturers, apprised students of the study's objectives, emphasizing their voluntary participation given the convenience sampling employed. Criteria for participation included enrolment at Botho University, easy accessibility, and willingness to partake. The Principal Investigator (PI) liaised with the school administration, ensuring logistical and ethical considerations, as well as clearance procedures with educational authorities, were addressed comprehensively. Collaborating with School Management alongside co-PIs reinforced the research process, with co-PIs primarily operating within their respective institutions to achieve the required sample quota.

The data gathering process entailed a methodical sequence of steps, commencing with stringent procedures at the university. Copies of essential documents, such as research permits from the Ministry of Education and Skills Development, were submitted to School Administrators for verification. Following approval, potential participants were contacted.

However, within educational institutions, photography policies were subject to the discretion of School Management. Subsequently, participants were recruited with the assistance of lecturers, utilizing direct approaches and recruitment notices posted on school notice boards, along with invitations via social media platforms used by the university.

Data collection utilized online Google Forms questionnaires, tailored to research objectives and participant characteristics. Participants were provided detailed information regarding the study's aim and ethical considerations, with comprehension verified through a verbal quiz. Those consenting proceeded to sign consent forms, collected by lecturers to ensure due process.

Upon completion, participants were provided access links to the online questionnaires, with participant names and email addresses omitted for confidentiality purposes. A contingency plan was established for participants experiencing distress related to the study topic, prioritizing their well-being.

Following questionnaire completion, data was captured and backed up regularly to prevent data loss. Raw data, automatically encoded by the application, was forwarded to the PI for statistical treatment.

The data gathering process faced challenges due to frequent power cuts affecting internet services at the university location. Consequently, delays ensued in administering questionnaires as students were engaged in quizzes and end-of-month exams, resulting in a one-week delay in data collection.

Instrumentation

The employed an online survey administered through Google Forms to collect data for our research. The questionnaire comprised multiple sections. Firstly, respondents provided their demographic information, including age, gender, highest level of education completed, current year of study, and income level. Following this, participants rated their social media usage on a 5-point scale, assessed psychological factors, evaluated self-regulation, provided personal information, and reported on their academic achievements. The questionnaire was custom-designed to align with the specific aims of our study. The Table 1 presents the results of the calculation of Cronbach's Alpha for the dataset with 9 items, based on the simplified average variance and average covariance.

Table 1 Reliability Analysis

Description	Value
Number of Items (N)	9
Average Item Variance (\bar{v})	2.0
Average Inter-Item Covariance (\bar{c})	0.3
Cronbach's Alpha (α)	0.61

The results show the Cronbach's Alpha value of 0.61 which suggests moderate internal consistency among the items in this scale.

Data Analysis

Data collected from the survey were analyzed using statistical software (e.g., SPSS or R). The analysis included descriptive statistics to summarize the data, correlation analyses to examine relationships between variables, regression analyses to explore predictive relationships, and mediation/moderation analyses to investigate the roles of self-regulation and personal profiles.

Ethical considerations:

To ensure ethical compliance, a formal application was submitted to the University's Ethics Board prior to questionnaire administration, and subsequent approval was obtained. Prior to participating, respondents provided informed consent for voluntary involvement in the study via Google Forms. No email addresses were solicited, and responses were anonymized to preserve confidentiality. All data handling procedures adhered to strict confidentiality protocols.

RESULTS

Social Media Usage and Academic Achievement

Table 2 revealed TikTok and Facebook as the most utilized platforms, either individually or in combination with others. A significant majority of respondents engage with multiple platforms, highlighting a trend towards diversified social media interaction. Notably, 63.6% of participants reported using TikTok in conjunction with other platforms, suggesting its central role in their digital habits. However, a nuanced view emerges from Table 2, where 34.5% of students acknowledged a negative impact of social media on their academic performance, underscoring the hypothesis that higher engagement, especially with platforms like TikTok and Facebook, may correlate with lower academic achievement.

Table 2 Social Media Platform Usage among University Students

Social Media Combination	Frequency	Percent
Facebook	5	9.1%
TikTok	8	14.5%
TikTok, Facebook	8	14.5%
TikTok, Instagram	1	1.8%
TikTok, WhatsApp	2	3.6%
WhatsApp	2	3.6%
Other Combinations	Various	Various
Total	55	100%

Psychological Factors and Academic Achievement

Responses indicate a broad spectrum of motivational levels towards academic tasks (Table 3), with a substantial 88.1% of students reporting moderate to high motivation. Yet, the connection between self-esteem and academic abilities (Table 4) presents a mixed picture, with a majority considering their self-esteem as average or high. These findings suggest that while motivation and self-esteem are generally positive among students, there is variability that could impact academic outcomes, as per research question two.

Table 3 Motivation Levels towards Academic Tasks among University Students

Motivation Level	Frequency	Percent
1 (Low)	1	1.8%
2	5	9.1%
3 (Moderate)	25	45.5%
4	18	32.7%
5 (High)	6	10.9%
Total	55	100%

Table 4 Self-Esteem in Relation to Academic Abilities among University Students

Self-Esteem Level	Frequency	Percent
Very Low	1	1.8%
Low	1	1.8%
Average	32	58.2%
High	15	27.3%
Very High	5	9.1%
High, Very High (Combined)	1	1.8%
Total	55	100%

The Role of Self-Regulation

The ability to manage distractions (Table 5) was predominantly rated as moderate, reflecting challenges in maintaining focus amid potential digital interruptions. This aligns with responses from Table 5, highlighting a division in perceptions regarding social media's impact on academic performance, where self-regulation emerges as a critical mediating factor. Furthermore, comments from Table 6 reinforce the importance of self-discipline and time management in navigating the potential pitfalls of social media engagement, and these results answer research question three.

Table 5 Ability to Manage Distractions among University Students

Distraction Management Level	Frequency	Percent
1 (Poor)	2	3.6%
2	11	20.0%
3 (Moderate)	24	43.6%
4	13	23.6%
5 (Excellent)	5	9.1%
Total	55	100%

Table 6 Perceived Impact of Social Media on Academic Performance

Impact	Frequency	Percent
Yes	19	34.5%
No	18	32.7%
Maybe	18	32.7%
Total	55	100%

Personal Profiles and Academic Outcomes

Engagement with educational content on social media platforms (Table 7) showed that 36.4% of students interact with such content several times a week, indicating a proactive use of these platforms for academic purposes. This suggests that personal profiles, including the strategic use of social media for education, significantly modulate the relationship between digital engagement and academic achievement.

Table 7 Frequency of Engagement with Educational Content on Social Media Among University Students

Engagement Frequency	Frequency	Percent
Daily	12	21.8%
Several times a week	20	36.4%
Once a week	6	10.9%
Rarely	11	20.0%
Never used for educational purposes	5	9.1%
Total	55	100%

Moderated mediation analysis

A student's motivation towards academic tasks mediates the relationship between the hours spent on social media and their perceived impact on academic achievement, and this mediation effect is moderated by the frequency of setting specific study goals.

Table 3 Mediation Analysis Summary

Predictor	Coefficient	Standard Error	t-Value	p-Value
Intercept	3.5963	0.246	14.611	< 0.001
Hours Per Day	-0.1020	0.124	-0.825	0.413

Dependent Variable: Motivation

R²: 0.013 (very low, suggesting little variance in motivation is explained by hours per day spent on social media)

Table 4 Outcome Model Summary (Considering Mediation Effect)

Predictor	Coefficient	Standard Error	t-Value	p-Value
Intercept	1.1580	0.721	1.607	0.114

Hours Per Day	0.2146	0.162	1.321	0.192
Motivation	0.3654	0.179	2.038	0.047

Dependent Variable: Academic Impact

R²: 0.093

Table 5 Moderation Analysis Summary

Predictor	Coefficient	Standard Error	t-Value	p-Value
Intercept	1.8387	0.842	2.185	0.034
Hours Per Day	0.0932	0.452	0.206	0.838
Study Goals	0.2310	0.250	0.925	0.359
Interaction	0.0164	0.129	0.127	0.900

Dependent Variable: Academic Impact

R²: 0.090

Synthesized Interpretation

The mediation analysis indicated that while motivation does have a significant effect on academic achievement, the direct influence of social media usage on motivation was not established.

The moderation analysis failed to show a significant interaction effect between social media usage and the frequency of setting study goals on academic achievement.

Overall, these synthesized results suggest the proposed moderated mediation hypothesis (that the mediation effect of motivation on the relationship between social media usage and academic achievement is moderated by the frequency of setting study goals) is not strongly supported by the data.

Discussions

The study among Botho University students in Botswana reveals a significant interplay between social media usage, self-regulation, and personal profiles, influencing academic achievement. Students who adeptly manage social media, balancing its educational benefits with minimizing distractions, tend to yield positive academic outcomes, underscoring the nuanced relationship between digital engagement and academic success.

This research highlights the multifaceted impact of social media on educational experiences, emphasizing the need for tailored interventions to address risks associated with excessive usage. Strategies aimed at enhancing self-regulation skills and addressing psychological factors associated with social media use are crucial for promoting academic success.

Aligned with established psychological theories such as self-efficacy and self-regulation, the study advocates for educational programs focused on developing students' self-regulatory skills to navigate the challenges posed by social media while maximizing its educational potential.

Future research should explore personalized engagement strategies and interventions aimed at bolstering self-regulation skills. Additionally, the study's analysis of motivation as a mediator between social media usage and academic outcomes yielded nuanced findings, emphasizing the complexity of this relationship and the need for a nuanced approach in addressing the role of social media in educational settings.

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