Article

Social Media Usage and Academic Performance of Undergraduate Science Education Students: Evidence From Universities in Rivers State, Nigeria

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Abstract: The rise of information and communication technology, particularly social media, has profoundly shaped human behaviour due to its global acceptance and relevance in various areas of life. Students, in particular, are increasingly active on social networking platforms, often displaying inappropriate usage, such as during lectures or in places of worship. This study explores how social media usage affects the academic performance of science education students at universities in Rivers State, Nigeria. A sample of 1,026 students was randomly chosen from Ignatius Ajuru University of Education (IAUE) and Rivers State University (RSU) to complete a questionnaire designed by the researcher. Results of the study revealed that students primarily use social media for communication (mean = 3.89), with Facebook being the most frequently used platform for academic purposes (mean = 3.92) and skype the least used (mean = 1.03). The result also show that while social media has both positive and negative effects on academic performance, poor time management and unregulated use significantly contribute to the negative impacts. To address these issues, students are encouraged to adopt effective time management strategies and prioritize their responsibilities and social media usage. Additionally, students should focus on leveraging social media to enhance their academic outcomes rather than engaging in excessive or nonessential activities on social media.

1. Introduction

Social media (SM) has become a vital tool for sharing content, initiating discussions, promoting businesses, and surpassing traditional media (e.g., newspapers, radio, television) in effectiveness in aspects such as quality, reach, usability, and permanence (Gu et al., 2018). Despite challenges in defining social media due to its evolving nature (Solomon & Tuten, 2017), it broadly encompasses platforms facilitating social interaction and information exchange. It can be described as a computer-based technology that makes it easier for people to initiate, create, share information, ideas, and thoughts in written, oral, image and pictures formats through online individuals, groups, organisations and networks. Tuten et al. (2015) defines it as a technology-driven platforms that facilitate the collaboration, sharing of information, ideas, and thoughts within online networks of people, organizations and communities. Globally, 4.95 billion people have been found using the Internet, with approximately 4.62 billion active on social media platforms (Johnson, 2022). These platforms are designed to be user-centric, fostering communal interactions and acting as online facilitators of human networks that enhance social connectivity. Users typically access social media through desktop applications or mobile

apps, enabling them to engage in highly interactive spaces where individuals, communities, and organizations share, co-create, discuss, and refine user-generated or curated content (Schivinski et al., 2020). Additionally, social media is utilized for purposes such as documenting memories, advertising, learning, building friendships, and cultivating ideas through blogs, podcasts, videos, and gaming platforms (O'Keeffe & Clarke-Pearson, 2011).

The widespread use of social media has made it a defining feature of modern science and technology. Popular platforms like Facebook, Skype, YouTube, Instagram, LinkedIn, Twitter, and WhatsApp are frequently used, particularly by students (Borgohain & Gohain, 2020). Among these, Facebook leads with 2.79 billion monthly active users, followed by YouTube (2.29 billion) and WhatsApp (2 billion) (Statista, 2021). These platforms are especially favoured by teenagers and young adults as a means of virtual global communication (Celestine & Nonyelum, 2018) and information particularly among students, who access them daily (Azizi et al., 2019). University students are among the most active users, utilizing social media for academic collaboration (Liu et al., 2022), accessing resources, forming study groups, and expediting information retrieval (Ansari & Khan, 2020; Gikas & Grant, 2013). Furthermore, educational institutions leverage these platforms to engage with students and alumni and share academic updates (Bajpai, 2018). Thus, social media plays a crucial role in fostering students' academic and career development (Kolhar, Kazi & Alameen, 2021; Ansari & Khan, 2020; Tezer et al., 2017).

Despite the benefits of social media in providing students with learning opportunities, excessive and improper use of social media has been linked to negative consequences such as addiction and negative impact on academic performance (Giunchiglia et al., 2018; Abidemi, 2019; Rahman & Mithun, 2021). Abidemi (2019) reported that excessive time spent on social media for non-academic activities, such as entertainment or chatting, reduces the time available for studying, which adversely affects academic outcomes. Other studies (Hasnain et al., 2015; Meier et al., 2016; Kolan & Dzandza, 2017; Kauser & Awan, 2019; Castrén et al., 2022) also highlight the negative impacts of social media on academic performance, while Alwagait et al. (2015) found no relationship between social media and academic scores. However, they found that the respondents reported that excessive use of social media had a negative impact on their performance. The negative impact of social media on academic performance becomes more pronounced when students give precedence to social media over attending classes or completing their coursework. In contrast, Aldas et al. (2024) reported no significant effect of social media on students' academic outcomes related to time management. Their findings suggest that social media does not cause divided attention. These research findings on the effects of social media on academics remain mixed. Again, a review of 23 empirical studies emphasizes these contradictory results and suggests further investigation is needed (Doleck et al., 2018). Such findings underscore the importance of understanding how social media usage influences academic performance, and this necessitates the present study.

Statement of the Problem

Student academic performance is a major concern for educators, administrators, parents, and governments. Yearly fluctuations in academic outcomes are troubling for stakeholders. Since the emergence of social media in the 1990s, students have increasingly engaged in social networking. This is evident in behaviours such as using social media in inappropriate settings, like lecture halls or places of worship. Although numerous studies have explored the impact of social media on academic performance, the findings are inconclusive, and there is limited research specific to science education students in Rivers State. To address this gap, this study investigates the influence of social media usage on the academic performance of undergraduate science education students in two River state Government owned universities.

Purpose of the Study

The purpose of this study is to examine how social media impacts the academic performance of science education students from universities in Rivers State. The specific objectives are to:

1. Determine the primary reason(s) for using social media platforms among the undergraduate science education students in Rivers State universities.

2. Identify the extents of usage of social media platforms among undergraduate science education students in Rivers State universities?

3. Analyze the impacts of social media usage on their academic performance.

4. Determine the significant difference between negative and positive impacts of social media usage on academic performance of undergraduate science education students.

Significance of the Study

This study's findings will provide valuable insights for educational stakeholders, including the government/policymakers, educators, parents, and students by offering strategies to help students use social media effectively for science learning, thereby improving academic performance.

For the government and policymakers, the results may guide the development of appropriate regulations, policies and strategies to optimize social media use for educational purposes. Teachers and parents can use these findings to encourage more productive engagement with social media among students. Students, in turn, will gain a better understanding of how social media usage affects their academic success, enabling them to adopt healthier social media habits to enhance their academic performance. Additionally, this research will contribute to the existing body of literature on the relationship between social media and academic performance.

Research Questions and hypothesis

The following four questions and one hypothesis guide the study:

1. What are the primary reasons for using social media among undergraduate science education students in Rivers State universities?

2. What are the extents of usage of different social media platforms among undergraduate science education students in Rivers State universities?

3. How does social media usage influence the academic performance of undergraduate science education students in Rivers State universities?

HO_1: There will be no significant mean difference between negative and positive impacts of social media on academic performance of undergraduate science education students in Rivers State universities.

Literature Review

Social Media and Academic Performance

Academic performance represents a key focus in education and is assessed through student achievements in tests or teacher-assigned goals. Institutions aim to enhance students' academic outcomes, which play a crucial role in career development and overall quality of life (Narad & Abdullah, 2016).The concept of academic performance encompasses multiple factors, from earning degrees to moral and skill development (York, Gibson & Rankin, 2015). Its significance lies in the link between education and future success, making it a priority for researchers, parents, and policymakers.

Aldas et al. (2024) investigated how social media use influences the academic performance of Bachelor of Science in Office Administration (BSOA) students. The study involved 61 fourth-year BSOA graduating students from Carlos Hilado Memorial State University-Fortune Towne Campus during the first semester of the Academic Year 2022-2023. Data were collected using a modified survey questionnaire and analyzed through

frequency counts, percentage distribution, and mean. The findings revealed that most respondents had a General Weighted Average (GWA) ranging from 80 to 90, with 69.97% having attended public schools. Facebook emerged as the most popular platform, with 98.3% of participants using it for 1 to 5 hours daily. The study concluded that social media moderately influenced communication and social skills but had minimal to no impact on time management. These results suggest that students' academic performance remained stable despite significant social media usage. Additionally, the data indicated that increased time spent on social media did not necessarily lead to poorer academic outcomes.

Al-Rahmi and Zeki (2018) discovered that the impact of social media on academic performance can be both positive and negative, depending on its usage. Their findings showed that students who utilized social media for educational purposes achieved higher GPAs compared to those who did not. The study suggested that students prioritize using social media for academic activities rather than leisure to enhance their academic outcomes.

Shakoor, Fakhar, and Abbas (2021) analyzed the effects of smartphone usage on students' learning behaviour and academic performance in Pakistan. Using a quantitative research method, data were gathered from 250 university students through a self-administered questionnaire. Findings indicated that smartphone usage positively influenced learning behaviour, although its effect on academic performance was minimal. The study also noted that female students tended to use smartphones more frequently for academic activities than their male counterparts. These results provide meaningful insights into the role of smartphones in shaping learning behaviours and academic achievements among Pakistani students.

Kauser and Awan (2019) investigated the relationship between social media usage and the academic performance of graduate students in Pakistan. The study employed a quantitative approach and surveyed 250 students from three universities in Lahore. Results revealed a significant negative correlation between excessive social media usage and academic performance. The research emphasized that both the type of social media platform used and the time spent online were key factors affecting academic success, with heavy social media use leading to poorer academic outcomes.

The research by Owusu and Larson (2015), titled "Use of social media and its impacts on academic performance of tertiary students," found that a significant number of students in Ghana were heavily engaged with social networking platforms. The study also highlighted that most users primarily used these sites for chatting and downloading, which adversely impacted their academic performance.

Amin et al. (2016) studied the influence of social media usage on the academic performance of university students in Pakistan. The researchers collected data from 300 students at three universities using a survey questionnaire. The study found that most participants utilized social media for academic purposes, such as participating in group discussions, sharing educational resources, and accessing research materials.

Mansour et al. (2020) conducted a cross-sectional observational study with 1,060 participants from six medical and non-medical colleges in Saudi Arabia's Qassim region during the 2019–2020 academic year. The study revealed that social media use was highly prevalent among participants and significantly correlated with grade point average (GPA). Students who participated in academic discussions on social media reported improved academic performance. Additionally, most participants used social media to share knowledge with peers, and a significant proportion agreed that leveraging social media for research purposes helped improve their grades.

Lau (2017) investigates the connection between social media use, multitasking on social media, and academic achievement among university students. The study reveals that frequent social media usage and multitasking negatively affect academic performance. In

particular, students who spend more time on social media and multitask during study sessions are more likely to have lower grades.

The reviewed literatures present a mixed picture of the impact of social media on students' academic performance. Research indicates that social media offers university students numerous opportunities for knowledge acquisition and academic improvement. However, excessive use can introduce challenges that jeopardize academic success. Consequently, further research is recommended to analyze the comparative effects—both positive and negative—of social media on students' academic performance..

2. Methodology

Study Design

This study utilized a descriptive research design, incorporating both quantitative and qualitative approaches, with a greater focus on quantitative data to make accurate predictions about the issue under examination.

Sample and Sampling Technique

A total of 1,260 science education students were included in the study. Participants were randomly sampled from two universities in Rivers State: Ignatius Ajuru University of Education, Rumuolumeni, and Rivers State University, Nkpolu-Oroworukwo.

Data Collection Instrument

Data were collected using the researcher-designed questionnaire called the Social Media and Academic Performance (SOMEAP) scale. The instrument consisted of statements aligned with the study's objectives and employed a 4-point Likert scale for participants to indicate their level of agreement or disagreement.

Validity and Reliability

The instrument's content validity was established through reviews by experts in ICT and science education. Based on their feedback, necessary revisions were made. Reliability was determined using a pilot study, and Cronbach's Alpha was calculated to be 0.707, confirming the instrument's reliability.

Data Collection Method

The questionnaire was directly distributed to participants in their institutions, who completed it and returned their responses.

Data Analysis Method

Data were analyzed using mean values. Responses on the 4-point scale were categorized as follows: 1.0–1.79 (very low), 1.80–2.59 (low), 2.60–3.39 (high), and 3.40–4.0 (very high). A t-test was employed to evaluate the only hypothesis at a 0.05 significance level.

3. Results

Presentation of Results

Data were presented in tables aligned with the study's objectives, followed by interpretations

Table 1. Mean responses and ranking of reasons for using social media platforms

S/N	Social Media sites	Mean	Decision	Rank
1.	Entertainment and funs	3.77	Very high	2nd
2.	Social interaction	3.64	Very high	3rd
3.	Education /Academic work	2.68	High	7th
4.	Business	3.13	High	6th
5.	Communication	3.89	Very high	1st

6.	Collaboration	3.57	Very high	4th
7.	Stay up dated with information, news and events	2.61	High	8th
8.	Meet new people and make friends	3.56	Very high	5th

Table 4.2 illustrates the mean responses and ranking regarding students' purposes for using social media platforms. The results show that the most preferred purpose is communication (3.89), followed by entertainment and fun (3.77), social interaction (3.64), collaboration (3.57), meeting new people and making friends (3.56), business (3.13), education and academic work (2.68), and staying updated with information, news, and events (2.61). This suggests that students primarily use social media for communicating with friends and family, while its use for staying informed and for academic purposes is less common.

Table 2. Mean extent and ranking of usage of social media platforms/sites

S/N	Social Media sites	Mean	Decision	Rank
1.	Facebook	3.92	Very high extent	1st
2.	Pinterest	1.16	Very low extent	12th
3.	Youtube	3.14	High extent	5th
4.	LinkedIn	2.12	Low extent	10th
5.	Tiktok	3.59	Very high extent	4th
6.	Google	3.74	Very high extent	3rd
7.	Reddit	3.01	High extent	6th
8.	Instagram	2.16	Low extent	9th
9.	Snapchat	2.31	Low extent	8th
10.	Wechat	2.08	Low extent	11th
11.	Skype	1.03	Very low extent	13th
12.	Twitter	2.43	Low extent	7th
13.	Whatsapp	3.88	Very high extent	2nd

Table 2 presents the mean responses and ranking regarding students' use of social media platforms for academic purposes. The data indicate that the platforms with the highest extent of use are ranked as follows: Facebook (1st), WhatsApp (2nd), Google (3rd), and TikTok (4th). Platforms with a high extent of use include YouTube (5th) and Reddit (6th). Those with a low extent of use are Twitter (7th), Snapchat (8th), Instagram (9th), LinkedIn (10th), and WeChat (11th). Lastly, platforms with a very low extent of use are Pinterest (12th) and Skype (13th). Overall, Facebook emerges as the most used social media platform, while Skype is the least used.

Table 3. Mean extent of students responses on positive impacts of social media on their academic performance

S/N	Item Statement	Mean	Std. Dev.	Decision on impact
1.	I regularly use social media platforms to access resources for my assignments and projects.	3.69	0.62	Very high impact
2.	Social media enables knowledge-sharing with my friends and peers.	3.61	0.59	Very high impact
3.	Joining academic discussions on social media deepens my understanding of class topics	3.12	0.54	High impact
4.	Social media allows me to engage in discussion with my lecturers on class-related issues	2.70	0.71	High impact
5.	Social media helps me stay informed about the latest news and technological developments.	2.68	0.65	High impact
6.	With social media I easily discuss academic topics with my classmates.	3.60	0.69	Very high impact

7.	Social media has increased my knowledge in science education and other related fields..	3.61	0.60	Very high impact
8.	There is no much improvement in my grades since I became engaged into these social networking site**s.**	1.03	0.81	Very low impact
9.	I use materials obtained from social media sites to complement and enhance what I have learnt in class	2.66	0.70	High impact
10.	Using social media can improve my academic performance	3.62	0.64	Very high impact
	Average	**3.03**	**0.66**	**High impact**

Table 3 presents the mean extent of students' responses to statements regarding the positive impacts of social media on academic performance. The mean response for item 8 reflects a very low positive impact of social media on students' academics. Conversely, the mean responses for items 3, 4, 5, and 9 indicate a high positive impact. Additionally, the mean responses for items 1, 2, 6, 7, and 10 show very high positive impacts. Overall, the table reveals an average mean response of 3.03, suggesting a generally high negative impact of social media on the academic performance of undergraduate science education students in Rivers State.

Table 4. Mean extent of students' responses on negative impact of social media on their academic performance.

S/N	Item Statement	Mean	Std. Dev.	Decision on Impact
1.	I always answer calls even while doing academic work.	2.68	0.87	High impact
2.	During study or lecture time I hardly ignore responding to notifications and posts which is not very good when I am engaged in academic work.	3.67	0.71	Very high impact
3.	I often watch online films and videos	2.65	0.86	High impact
4.	I feel distracted during studying time to watch or respond to some online posts.	3.52	0.79	Very high impact
5.	Watching movies online sometimes deprive me of completing my assignments.	2.57	0.95	High impact
6.	When the need arises I always chat with friends during lecture time even while studying at home or in the library.	3.39	0.75	High impact
7.	When I am idle I often use social media to while away time.	2.88	1.01	High impact
8.	On the average I spend a minimum of 8 hours per day on social media most time not for academic purpose	3.61	0.70	Very high impact
9.	I am easily carried away while browsing such that sometimes it made me go late to lectures.	2.57	0.94	Low impact
10.	I think I cannot stay without visiting any of the social media platforms even when I am learning or studying	3.96	0.61	Very high impact
11	I spend much time in the night on social media for entertainment and business.	3.28	0.72	High impact
	Average	**3.16**	**0.81**	**High impact**

Table 4 outlines the mean extent of student responses to statements highlighting the negative impacts of social media on academic performance. The data show that the mean responses for statements 2, 3, 8, and 10 indicate very high negative impacts, while the mean responses for statements 1, 4, 5, 6, 7, 9, and 11 reflect high negative impacts. On average, the overall mean of 3.16 suggests a significant negative impact of social media on the academic performance of undergraduate science education students in Rivers State.

Table 5. t-test of significant difference between positive and negative impacts of social media usage on students' academic

Groups	No. of items	Mean (M)	SD	t-cal	t-table	df	Decision at .05 level of significance
Positive impacts	10	3.03	0.66	0.40	0.28	19	Significant
Negative impacts	11	3.16	0.81				

Table 5 presents the t-test results for the mean difference between the positive and negative impacts of social media usage on the academic performance of science education students. The data reveal that the mean for positive impacts (M = 3.03, SD = 0.66) is lower than that for negative impacts (M = 3.16, SD = 0.81). The t-test further indicates that the mean difference is statistically significant in favour of the negative impacts, as the calculated t-value (0.40) exceeds the critical t-value (0.28) at a 0.05 significance level and df = 19.

4. Discussion

The analysis of data addressing research question one reveals that the primary purpose for which students use social media is communication and chatting, with 51.67% of students using it for this purpose, followed by entertainment (25.83%), accessing information (15.63%), and academic work/learning (6.67%). These results suggest that students primarily use social media for communication with family and friends. While communication remains the dominant use globally, entertainment, information-seeking, and learning have become increasingly popular. Students are actively participating in Facebook groups focused on academic and professional topics such as IELTS preparation, scholarship information, and job exam preparation. This is consistent with the findings of Kabir, Roy, and Kashem (2016) and Karjo (2020).

Findings related to research question two indicate that Facebook is the most commonly used social media platform among students. This finding aligns with previous studies by Aldas et al. (2024), Auxier and Anderson (2021), Rainie et al. (2013), and Knight-McCord et al. (2016), all of which reported that Facebook dominates the online landscape compared to other social media platforms. Supporting Aldas et al. (2024), this study also found Skype to be less popular. The preference for Facebook among students may be attributed to its features, which allow users to connect with a wide range of people based on their name, location, and interests. In contrast, Skype, identified as the least used platform in this study, is more limited in that it only connects people who are on one's contact list and restricts video calls to two participants at a time.

Regarding the impact of social media on academic performance, the results indicate that social media has both positive and negative effects. This supports the findings of Aldas et al. (2024), Kausar and Awan (2019), and Asano (2017). On the positive side, students reported using social media for engaging in academic discussions, connecting with lecturers and peers, accessing research materials for assignments and projects, enhancing their understanding of class topics, and supplementing classroom learning. However, the respondents also noted the negative effects, such as distractions from studies caused by emergency calls and online posts. They admitted to spending a minimum of 8 hours per day on social media, often more time than on their academic work. Some students even acknowledged that they could not refrain from visiting social media platforms while studying. This finding aligns with Asano's (2017) study, which revealed that the average person spends nearly two hours (approximately 116 minutes) daily on social media, amounting to over five years over a lifetime, leading to social media

addiction. Conversely, Aldas et al. (2024) found no evidence that social media use affected students' time management or divided attention during academic tasks, concluding that even excessive social media use did not negatively influence academic performance. The substantial mean difference observed between the positive and negative impacts, with a tendency toward negative effects, is likely due to how some students use social media for academic purposes. Data on the primary reason(s) students use social media show that communication ranked first, while education and academics were ranked seventh out of eight identified reasons for social media usage. Clearly, when used properly for educational and constructive purposes, social media can enhance students' academic performance. However, improper use can have detrimental effects on their academic results. Many students misuse social media, which contributes to poor academic performance. Research by Castrén et al. (2022) at the University of Dhaka found that 88% of students' academic activities were negatively impacted by excessive social media use. Likewise, Alwagait et al. (2015) reported that 60% of respondents believed that excessive social media use adversely affected their performance. Similarly, Kauser and Awan (2019) identified a significant negative correlation between excessive social media use and academic achievement.

Another factor contributing to the observed disparity in the positive and negative impacts is the type of social media platform used and the amount of time spent online. Findings on the usage of different social media platforms revealed that Facebook and WhatsApp were the two most commonly used. However, these platforms are mainly for communication and chatting, not for academic purposes. This supports Kauser and Awan's (2019) conclusion that both the choice of platform and the time spent online are crucial factors influencing academic success, with heavy social media use leading to poorer academic outcomes. Unregulated social media use has caused some students to lose focus in class, spend excessive time online, and even suffer from sleepless nights, surfing the internet for non-academic content. Many students spend time watching videos, chatting with friends, downloading music, and some engage in illegal online activities. Kolhar et al. (2021) noted that most students use social media for non-academic reasons, such as chatting or browsing social networking sites simply to pass the time. Time is a critical factor in academic success, and once wasted, it cannot be recovered. Abidemi (2019) found that excessive time spent on non-academic social media activities, such as entertainment or chatting, reduces time available for studying, negatively impacting academic performance. Spending too much time socializing on social media is detrimental to academic success. Effective time management and task prioritization can help reduce stress and inefficiency, leading to improved academic performance.

5. Conclusion

Based on the findings of this study, it is concluded that social media are online fora for communication, interaction, entertainments and learning, however communication emerges as the primary purpose for student usage of social media. Students use facebook more than any other social media platforms. Usage of social media platform has significant impacts on students' academic performance. It has both positive and negative impacts on students' academic achievement. Although, students benefit from its usage, the negative impact of social media on present day students' academic performance is significant due to its ability to distract students from studies as most students are addicted to it. It also consumes the time the students would have used to study as they often spent much time to surf social media platforms for non- academic issues. Time management plays an essential role in determining the success or failure of an individual. Thus students who lack time management skills can easily fall prey to the negative impact which social media platforms present to its user and thus contribute in lowering their academic performance.

Recommendations

Based on the findings, it was suggested that:

1. Universities in conjunction with the National Universities Commission and Ministry of Education should organized seminars for students on the impact of social media on

learning and academic performance. In addition, lecturers should be advising their students on the ills of social media on academic performance.

2. The students should practice time management and prioritize their tasks and social media usage. They can fix a particular time of the day for using social media rather than allowing themselves to be distracted while in class by social media. This will enable them manage their time effectively not mostly for social media.

3. Students should learn not to visit social media platforms excessively instead they should use social media more in ways that will enhance their academic performance.

4. Tracking apps that will monitor social media usage and inform the user about time spent should be installed to checkmate students' use of social media.

5. Students should endeavour not to get addicted to different social media sites

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