



Perceived Influence of Social Media on Computer and Robotics Education Students' Academic Engagement, Collaboration and Achievement

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Abstract

The main purpose of this study was to investigate the perceived influence of social media on Computer and Robotics Education students' academic engagement, collaboration and achievement in University of Nigeria, Nsukka. The study adopted a descriptive survey research design. Five specific purposes and six null hypotheses were formulated to guide the study. The population for the study was 380 participants comprising 297 male and 83 female students of Computer & Robotics Education respectively. Convenience sampling technique was adopted for selecting the sample size of 117 participants comprising 86 male and 31 female students of Computer & Robotics Education respectively. Google Forms was used for data collection, which was face-validated by two ICT experts and one expert from Measurement and Evaluation Unit. Cronbach Alpha method was used to estimate the internal consistency of the instrument and an overall reliability coefficient of 0.87 was obtained. The data collected for the study were analyzed using mean, standard deviation, and t-test statistical tools. The findings of the study revealed that the students perceived social media as a digital tool that positively influences their academic engagement, collaboration, and achievement. The findings also revealed among others that students don't spend most of their time on social media during school hours; they do not prefer using group chats, audio and videos calls for their class virtual meetings; they are not distracted by social media; they don't consult or relate with their lecturers through social media; they don't have conflict with their classmates on social media. Interestingly, the students were of the opinion that social media should not be banned in schools. The study therefore recommends that policies, rules and regulations for positive, meaningful, and responsible use of social media in schools should be enacted; teachers should be exposed to regular training on the effective use of digital tools to enhance their teaching practices especially in this era of artificial intelligence (AI).

Keywords: Social Media, Computer and Robotics Education, Academic Engagement, Academic Collaboration, Academic Achievement

Introduction

Digital technology has significantly changed the way in which the youths exchange information and ideas with one another in an interesting, engaging, memorable, and inspiring manner. Social media is one of the digital technologies that has influenced remote interaction among people of all ages, from all parts of the globe. According to Larson (2024), social media has transformed how individuals communicate, connect, and consume information in the modern digital age. Social media refers to platforms such as social networks, blogs, micro-blogs and forums where self-generated contents of users are shared by the user like a publisher (Tiryakioglu & Erzurum, 2011; Britannica, 2024). It can also be referred to as a variety of technologies that facilitate the sharing of ideas and information, including text and visuals, through virtual networks and communities, among their users (Dollarhide, 2024; Search Engine Journal, 2024). Examples of social media platforms include Instagram, YouTube, Telegram, Facebook, MySpace, WhatsApp, Twitter, and others. According to Larson (2024), Facebook, with over 3.15 billion monthly active users, remains the largest social media platform, followed by YouTube, WhatsApp, and Instagram, while TikTok has surpassed 1 billion active users, becoming one of the fastest-growing social media platforms. Statista (2024) revealed that in Nigeria, the most widely used social media platforms, as of the 3rd quarter of 2023,



based on their rankings, are WhatsApp (95.1%), Facebook (75.5%), Instagram (59.1%), Tiktok (54.7%), FB Messenger (48.5%), X (Twitter) (40.5%), Snapchat (37.6%), Telegram (33.4%), LinkedIn (18.1%), and Pinterest (13.9%).

Since the inception of social media in 1996, it has managed to infiltrate more than half of the 8.06 billion people in the world; and as of July 2024, the number of people using social media is over 5.17 billion worldwide, with the average user accessing 6.7 social media platforms on a monthly basis; and the average time a person spends on social media a day is 2 hours 20 minutes (Backlinko, 2024). Furthermore, Datareportal (2024) reported that in Nigeria, there were 103.0 million internet users at the start of 2024, when internet penetration stood at 45.5 percent. It further stated that Nigeria was home to 36.75 million social media users in January 2024, equating to 16.2 percent of the total population. A total of 205.4 million cellular mobile connections were active in Nigeria in early 2024, with this figure equivalent to 90.7 percent of the total population; and out of 103 million Internet users in Nigeria, 36.75 million used social media in January 2024. On the global scale, Larson (2024) revealed that the most popular social media activities include watching videos (82%), reading news (76%), and interacting with friends and family (72%); the gender split for social media users is relatively even, with 48.4% male and 51.6% female users respectively. The majority of social media users (59%) are between the ages of 18 and 34 (Larson, 2024).

Studies have shown that social media has more benefits for the young school age in today's global community (Ibrahim, 2012; Wickramanayake & Jika, 2018; Wordu, Uchendu & Alabo, 2020). Social media sites facilitate instant online discussion, connects friends and families, promotes knowledge sharing, provides users with news updates on current affairs, finds communities with shared experiences, using it for political campaigns, serves as a source of information on job opportunities and recruitment, sharing learning and educational materials, etc. (Gaille, 2020; Valentine, 2020; Edwards, 2022; Edeh, 2022; Ellis, 2024; Raju, 2024). Through social media, individuals can share texts, files, pictures, videos, create blogs, send messages and conduct real time conversations (Boyd, 2007 cited in Wordu, Uchendu & Alabo, 2020). In Nigeria, where over 60% of the population is under 25, social media has become an integral part of daily life for the youth, influencing various aspects of society, including education (iCreative, 2024). This influence, according to iCreative, brings both positive opportunities and challenging consequences for Nigerian youth, as social media reshapes learning dynamics, attitudes, and access to information. On the positives, students point at the opportunities for self-expression, sociability, community involvement, creativity, easy access to educational resources, and group belongings (Akambi & Anyio, 2014; Abudabbous, 2021; Dimari & Tyagi, 2022; iCreative, 2024). However, on the negative aspects, social media, if not used responsibly, distracts students leading to poor academic performance; presentation of misinformation (fake news) that can affect learning; isolation and depression; and others (Damota, 2019; Gaille, 2020; Abudabbous, 2021; Dimari & Tyagi, 2022; Edeh, 2022; iCreative, 2024).

Despite the concerns that are related to the use of social media in education, many schools are now using it to promote education, keep students up to date with assignments, and offer help to those in need. Social media and learning management systems were found very useful during the Covid-19 pandemic era, where teaching and learning took place remotely irrespective of geographical location (Tayo, 2019; Nwangwu, et al., 2024; iCreative, 2024). According to iCreative (2024), students can collaborate, study in groups, form discussion classes or create virtual study communities, through social media platforms (such as WhatsApp, Facebook, and Telegram). Social media also promotes engagement and retention in service (Wickramanayake & Jika, 2018; Naslund, Bondre, Torous & Aschbrenner, 2020). According to Montgomery (2024), student engagement refers to the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught; which extends beyond the classroom and includes emotional investment in educational activities. Studies have revealed that engaged students are more likely to retain information,



understand complex concepts, and pursue further knowledge (Anderson, 2024; iCreative, 2024). Active engagement and participation in class activities promote students' academic performance.

Many researchers have explored the influence of social media on academic achievement of students; and have defined it as the sum total of a student's ability and performance (Morrell, 1987 cited in Wordu et al., 2020). Wordu et al. (2020) expressed that academic performance provides a view of how a student has performed in his or her course of study; and it involves the assessment of students' learning progress in task that is required of them (Andreas & Haenlein, 2010 cited in Wordu et al., 2020; pg. 2). Studies have shown that social media positively influence the academic performance of students (Sivakumar, 2020), although its use in education has been so much criticized by many researchers. Some of these criticisms emanate from irresponsible use of social media by students, which includes distractions from junk/irrelevant posts, poor grammar, poor time management, poor reading habits, and so on (Jabay, 2012; Mbachu, 2011; Kuss & Griffiths, 2011; Wordu et al., 2020; Naslund, Bondre, Torous, & Aschbrenner, 2020; Eneh, 2022; iCreative, 2024; Nwangwu, 2024). However, Collin et al. (2011) reported that young people's online behaviour is often not well understood resulting in a digital disconnect between young people's use of technology and the knowledge and concerns that parents, professionals and community members. Drawing on contemporary research, case studies, and educational theory, social media, when used strategically and responsibly, has the potential to foster collaboration, engagement, and creativity in academic environments (Ogunbukola, 2024).

Research Objectives

The main objective of this study was to determine the perceived influence of social media on Computer and Robotics Education students' academic engagement, collaboration and achievement. Specifically, the study sought to determine the:

1. perceived influence of social media on students' academic engagement.
2. perceived influence of social media on students' academic collaboration.
3. perceived influence of social media on students' academic achievement.
4. factors that negatively influence students' use of social media for academic engagement, collaboration and achievement.
5. perceived ways of promoting the effective use of social media for academic purposes.

Research Questions

The following research questions were posed to guide the study:

1. What is the perceived influence of social media on students' academic engagement?
2. What is the perceived influence of social media on students' academic collaboration?
3. What is the perceived influence of social media on students' academic achievement?
4. What are the factors that negatively influence students' use of social media for academic engagement, collaboration and achievement?
5. What are the perceived ways of promoting the effective use of social media for academic purposes?

Hypotheses

The following null hypotheses were formulated to guide the study and were tested at 0.05 level of significance:

HO₁: Gender is not a significant source of difference in the mean ratings of Computer and Robotics Education students on the extent social media influences their academic engagement.



HO₂: Gender is not a significant source of difference in the mean ratings of Computer and Robotics Education students on the extent social media influences their academic collaboration.

HO₃: Gender is not a significant source of difference in the mean ratings of Computer and Robotics Education students on the extent social media influences their academic achievement.

Literature Review

Social media played positive roles in teaching and learning process as it enables individuals to communicate synchronously irrespective of space and time. A study by Wickramanayake and Jika (2018) revealed that students widely use mobile phones to access social media. Another study by Daniel-Isiocha and Dogo (2016) in Abuja, Nigeria revealed that students (51.7%) see social media as a positive influencer to their academic performance. According to Daniel-Isiocha et al. (2016), about 61.1% of students sees social media as having positive impact on their social lives; while 73.8% have access to internet for creation of accounts with 2go, BBM, Facebook and WhatsApp; about 61.9% states that social media affects their attitude positively. Previous study by Wordu et al. (2020) in Rivers State, Nigeria revealed that social media influenced the academic performance of University students. Sivakumar (2020) also revealed that 80% of students agreed that social media improved their academic performance, while 20% disagreed; however, students who have used social media for academic purpose have more academic performance than their counterparts do in same discipline.

Studies by Alamri (2019) in Saudi Arabia; Altawalbeh (2021) in Jordan; Mankani (2022) in India, revealed that there were positive and negative perceptions toward using social media for academic purposes; and that there were statistically significant relationships between the use of social network sites and students' academic performance. However, a study by Aina'u et al. (2016) in Nigeria revealed that social media utilization and rate of usage had no significant relationship with students' academic achievement. On the other hand, Yadav et al. (2023) found that approximately 58.3% of respondents agree that social media positively contributes to their academic performance, while 5.5% strongly disagree with this notion.

On the contrary, Al-Meneyes (2015) revealed that the amount of time one spends using social media affects academic performance in a negative way. Similarly, Aforo (2014) revealed that the use of social media among some students in Ghanaian institutions did not augur well for their academic performance due to preference on social media entertainment. Studies also revealed that academic achievement of students who use social media was poor because of distractions coming from its over-use for chatting followed by downloading music and video, etc. (Bernard & Dzandza, 2018; Ahmed et al., 2018; Agwi & Ogwueleka, 2018; Doe & Smith, 2024).

Social media can be used for academic collaboration among staff and students at all levels of education. Researches (Onuoha; Levine; Paul et al.; cited in Benedict et al., 2022) revealed that modern social media applications facilitate social interaction, enabling the creation of connections with current, and prospective students, and for the delivery of educational content, regardless of time and space. Social media creates an environment where increased critical thinking and collaboration are possible (Carini, Kuh & Klein, 2006; Shoshani & Rose Braun, 2007; Mazman & Usluel, 2010; Agwi & Ogwueleka, 2018; Oguguo et al., 2020; Reider, 2020; Lincoln Center Education, 2023; Mishnick & Wise, 2024). It also allows the creation and exchange of generated content with peers (O'Reilly, 2007; Kaplan & Haenlein, 2010; Bryer & Zavatarro; 2011; King, 2012; Nguyen, 2021). Studies found that students demonstrated significantly greater learning gains, in terms of recall of basic knowledge and critical thinking, when collaborating than when working independently (Hershock & LaVaque-Manty, 2012; Al-Rahmi et al., 2021; Chen & Fan; 2023). Students also reported greater motivation and persistence regarding problem-solving tasks when working collaboratively (Hershock & LaVaque-Manty, 2012; Pang & Ji, 2018; Nguyen, 2021). This was in



agreement with a previous study by Tarantino and McDonough (2014), who argued that participation in social media creates a more collaborative and communicative learning environment for students by providing opportunities for discussions and interactions with their peers.

On the issue of social media use for academic engagement, Brindley et al. (2009) stated that quality-learning environments, which include opportunities for students to engage in interactive and collaborative activities with their peers, have shown to contribute to better learning outcomes, including development of higher order thinking skills. Furthermore, by participating in a community of learners, students become more engaged with the course content which increases the achievement of learning outcomes, such as critical thinking and individual student development (Carini, Kuh, & Klein, 2006; Kuh, Cruce, Shoup, Kinsie, & Gonyea, 2008; Kuh, 2009; Reider, 2020; Alalwan, 2022; Lincoln Center Education, 2023; Ifinedo & Kankaanranta, 2023). When students are engaged, and are learning from peers or instructors, they show a high level of attention, curiosity, interest, optimism, and passion, which extends to their desire to learn (Nwachukwu et al., 2021; Umezulike & Nwagu, 2021; Nemetz et al.; Arnold & Paulus; Pozzi et al.; Fewkes & McCabe; cited in Alalwan, 2022).

Despite the positive influence of social media on teaching and learning, there are factors that negatively affect its effectiveness in the field of education. These factors include the use of social media to disseminate false information (fake news), high cost of internet subscription to use social media, addiction with social media leading to health issues (such as obesity, eye problems, insomnia/sleeplessness), posting and sharing of distractive materials (such as pornographic pictures or video clips), privacy concerns, peer pressure issues; cyberbullying, and others (Yadav et al., 2023; Adelakun, 2023; Mad Penguin, 2024). However, Yadav et al. (2023), Mad Penguin (2024), Nwangwu et al. (2024), and Adelakun (2023) proffered some suggestions on the way forward which include verification of information source, time management plan, managing data privacy, setting boundaries between use of social media for academic purposes and using it for entertainment, provision of uninterrupted electricity supply and internet services, adequate funding of ICT procurement and maintenance, among others.

Methodology

The study adopted a descriptive survey research design. The population for the study was 380 participants comprising 297 male and 83 female students of Computer & Robotics Education respectively. The distribution of the population is as follows: 4th Year = 28 (M = 23; F = 5); 3rd Year = 80 (M = 58; F = 22); 2nd Year = 122 (M = 94, F = 28); 1st Year = 150 (M = 122, F = 28). Convenience sampling technique was adopted for selecting the sample size of 117 participants comprising 86 male and 31 female students of Computer & Robotics Education respectively. Convenience sampling technique was chosen for the study because participation in the study was optional and data collection was done through Google Forms. Only those that filled the online form were involved in the study. The instrument, which was hosted in the Google Forms, was face-validated by two ICT experts and one expert from Measurement and Evaluation Unit, all from the University of Nigeria, Nsukka. Cronbach Alpha method was employed to estimate the internal consistency of the instrument for the five clusters, which yielded the reliability coefficients of 0.89, 0.95, 0.87, 0.81, and 0.83 respectively while the overall reliability coefficient of 0.87 was obtained. The data collected for the study were analyzed using mean while the null hypotheses were analyzed using t-test statistical tool. For the interpretation of the research questions, items ≥ 3.50 are Strongly Agree (SA); items ≥ 2.50 and ≤ 3.49 are Agree (A); items ≥ 1.50 and ≤ 2.49 are Disagree (D); and items ≤ 1.49 are Strongly Disagree (SD).

Presentation of Results and Discussion of Findings

This section presents the results of the data analysis, findings and discussion of findings for the study. The presentation was organized according to the research questions formulated to guide the study.

Research Question One: What is the perceived influence of social media on students' academic engagement?

Table 1: Mean Ratings of Responses of Respondents on the Perceived Influence of Social Media on Students' Academic Engagement

| S/No | Items Statement | \bar{x} | SD | Rmk |
|------------------|---|-------------|-------------|----------|
| 1 | I spend most of my time on social media during school hours | 2.36 | 0.79 | D |
| 2 | I mostly rely on social media for sourcing of vital information regarding my assignments | 3.09 | 0.75 | A |
| 3 | Social media help me improve my study habit/reading culture | 2.85 | 0.87 | A |
| 4 | I often post difficult concepts to social media platforms in order to seek for solutions or clarifications from my classmates | 2.84 | 0.95 | A |
| 5 | The notification posts on our social media platforms regarding assignments, exams and other announcements, have been so helpful to me to actively engage with my peers. | 2.90 | 0.91 | A |
| 6 | I prefer sourcing information regarding my studies on social media platforms than through emails, zoom, phone call, SMS, etc. | 3.03 | 0.85 | A |
| 7 | I am more comfortable using social media to help my classmates with their class works than through other sources | 2.72 | 0.87 | A |
| 8 | I prefer using group chats, audio and videos calls for our class virtual meetings | 2.28 | 0.92 | D |
| 9 | I obtain more information on educational events from other social networking sites outside my class platforms. | 3.22 | 0.73 | A |
| 10 | I follow and like the comments of others on social media regarding their contributions on our class works | 2.93 | 0.84 | A |
| 11 | I prefer using social media to comment and make my voice heard on discussions regarding our class activities or academic issues. | 2.70 | 0.89 | A |
| 12 | I do recommend educational materials to my classmates and share ideas on the materials through social media platforms | 3.13 | 0.78 | A |
| Cluster 1 | | 2.84 | 0.50 | A |

Key: \bar{x} = Mean; SD = Standard Deviation; A = Agree; D = Disagree; Rmk = Remark

The results in Table 1 revealed the perceptions of the respondents on the influence of social media on students' academic engagement. The findings indicated that two items had their mean scores below 2.50 ($\bar{x} < 2.50$) representing "Disagree" while the remaining 10 items had means scores above 2.50 ($\bar{x} > 2.50$) representing "Agree". However, the cluster 1 mean score of 2.84 indicates that the respondents agreed that social media positively influence their academic engagement. From the results in Table 1, it was observed that the respondents disagreed with item 1 (I spend most of my time on social media during school hours) and item 8 (I prefer using group chats, audio and videos calls for our class virtual meetings). Furthermore, the standard deviations presented in Table 1 ranged from 0.50 to 0.95 indicating that the respondents' opinions were not far from one another.

Research Question Two: What is the perceived influence of social media on students' academic collaboration?



Table 2: Mean Ratings of Responses of Respondents on the Perceived Influence of Social Media on Students' Academic Collaboration

| S/No | Items Statement | \bar{x} | SD | Rmk |
|------------------|--|-------------|-------------|----------|
| 13 | I always share my academic achievements (results, awards, etc.) with my friends/classmates through social media. | 2.61 | 0.95 | A |
| 14 | I have developed academic networks through social networking sites like Instagram, Facebook, WhatsApp, etc. | 2.84 | 0.79 | A |
| 15 | I collaborate with my classmates in real-time to execute our class projects/assignments through social media. | 2.96 | 0.81 | A |
| 16 | I often use social media platform to consult and collaborate with my lecturers on project-based learning activities like research writing. | 2.48 | 0.94 | D |
| 17 | Through social media, I was able to quickly know my classmates when I got admission into my department. | 3.10 | 0.82 | A |
| 18 | I often have conflict with my class mates on social media whenever we engage in class team work. | 2.12 | 0.84 | D |
| 19 | Social media is helping me in building a strong relationship and partnership with my classmates for future endeavours. | 2.99 | 0.73 | A |
| 20 | Working with my classmates through social media has boosted my confidence to work with any group or organization in the world. | 2.97 | 0.85 | A |
| 21 | I do well in my studies when I work collaboratively with my peers as a team through social media. | 2.90 | 0.86 | A |
| Cluster 2 | | 2.77 | 0.53 | A |

Key: \bar{x} = Mean; SD = Standard Deviation; A = Agree; D = Disagree; Rmk = Remark

The results in Table 2 revealed the perceptions of the respondents on the influence of social media on students' academic collaboration. The findings indicated that two items had their mean scores below 2.50 ($\bar{x} < 2.50$) representing "Disagree" while the remaining seven items had means scores above 2.50 ($\bar{x} > 2.50$) representing "Agree". However, the cluster 2 mean score of 2.77 indicates that the respondents agreed that social media positively influence their academic collaboration. From the results in Table 2, it was observed that the respondents disagreed with item 16 (I often use social media platform to consult my teachers on concepts that I need more clarifications) and item 18 (I often have conflict with my class mates on social media whenever we engage in class team work). Furthermore, the standard deviations presented in Table 2 ranged from 0.53 to 0.95 indicating that the respondents' opinions were not far from one another.

Research Question Three: What is the perceived influence of social media on students' academic achievement?



Table 3: Mean Ratings of Responses of Respondents on the Perceived Influence of Social Media on Students' Academic Achievement

| S/No | Items Statement | \bar{x} | SD | Rmk |
|------------------|--|-------------|-------------|----------|
| 22 | My participation in social media activities with my class mates has helped improve my academic grades. | 2.85 | 0.78 | A |
| 23 | With social media platforms, I complete any project-based learning activities quickly with high-level performance. | 2.76 | 0.76 | A |
| 24 | I have been able to acquire useful IT practical skills for my academics through social media posts. | 2.93 | 0.77 | A |
| 25 | Social media has changed my learning process and style, which has made me a better student | 2.88 | 0.79 | A |
| 26 | I always learn more and perform better when I discuss my assignments with peers and classmates through social media | 2.90 | 0.74 | A |
| 27 | My interactions with classmates in our social media platform during exam period help me remember answers to questions. | 2.84 | 0.79 | A |
| 28 | Social media is a distraction to me and has negatively affected my academic achievement | 2.24 | 0.85 | D |
| 29 | I do well academically when I use social media for educational purposes in the school than outside the normal school hours. | 2.73 | 0.81 | A |
| 30 | Commenting and actively engaging during social media virtual discussion class help me learn abstract concepts and boost my retention capacity. | 3.12 | 0.81 | A |
| 31 | Social media helps me find the best study materials, resources, and tools for writing my assignments and passing my exams. | 3.18 | 0.67 | A |
| Cluster 3 | | 2.84 | 0.47 | A |

Key: \bar{x} = Mean; SD = Standard Deviation; A = Agree; D = Disagree; Rmk = Remark

The results in Table 3 revealed the perceptions of the respondents on the influence of social media on students' academic achievement. The findings indicated that item 28 had a mean score below 2.50 ($\bar{x} < 2.50$) representing "Disagree" while the remaining nine items had means scores above 2.50 ($\bar{x} > 2.50$) representing "Agree". However, the cluster 3 mean score of 2.84 indicates that the respondents agreed that social media positively influence their academic achievement. From the results in Table 3, it was observed that item 31 had the highest mean score ($\bar{x} = 3.18$) indicating that social media is a useful platform for finding materials, resources, and tools for writing assignments and preparing for exams. Furthermore, the standard deviations presented in Table 3 ranged from 0.47 to 0.85 indicating that the respondents' opinions were not far from one another.

Research Question Four: What are the factors that negatively influence the use of social media for academic engagement, collaboration and achievement?



Table 4: Mean Ratings of Responses of Respondents on Factors that Negatively Influence the use of Social Media for Academic Engagement, Collaboration and Achievement

| S/No | Items Statement | \bar{x} | SD | Rmk |
|------------------|--|-------------|-------------|----------|
| 32 | I think my addiction to social media is having an impact on my health | 2.37 | 0.87 | A |
| 33 | The irrelevant/junk information that are posted on our social media platform distract me from my studies | 2.67 | 0.81 | A |
| 34 | Social media bullying by friends and classmates make the platform toxic and unfriendly to me. | 2.79 | 0.93 | A |
| 35 | High cost of data subscription prevents students from accessing high-capacity audio/visual learning materials. | 3.42 | 0.78 | A |
| 36 | The work of scammers often scares me from following links posted in our social media platform | 3.09 | 0.85 | A |
| 37 | Most at times, I experience poor internet connectivity which frustrates my use of social media for academic purposes | 3.51 | 0.66 | SA |
| Cluster 4 | | 2.98 | 0.53 | A |

Key: \bar{x} = Mean; SD = Standard Deviation; A = Agree; D = Disagree; Rmk = Remark

The results in Table 4 revealed the perceptions of the respondents on the factors that negatively influence the use of social media for academic engagement, collaboration and achievement. The findings indicated that item 37 had a mean score above 3.50 ($\bar{x} > 3.50$) representing “Strongly Agree” while the remaining five items had means scores above 2.50 ($\bar{x} > 2.50$) but less than 3.50, representing “Agree”. However, the cluster 4 mean score of 2.98 indicates that the respondents agreed that the item statements in Table 4 are factors that negatively influence the use of social media for academic engagement, collaboration and achievement. From the results in Table 4, it was observed that the respondents expressed dissatisfaction with the internet services provided to them by the school, which hinder their effective use of social media for academic purposes. Furthermore, the standard deviations presented in Table 4 ranged from 0.53 to 0.93 indicating that the respondents’ opinions were not far from one another.

Research Question Five: What are the perceived ways of promoting effective use of social media for academic purposes?

Table 5: Mean Ratings of Responses of Respondents on the Perceived Ways of Promoting Effective Use of Social Media for Academic Purposes

| S/No | Items Statement | \bar{x} | SD | Rmk |
|------------------|---|-------------|-------------|----------|
| 38 | Social media should be incorporated in the school curricular for effective teaching/learning. | 3.22 | 0.65 | A |
| 39 | Regular training/retraining of lecturers on modern ways of implementing social media in instructional delivery. | 3.18 | 0.65 | A |
| 40 | Guidelines and regulations on responsible use of social media should be developed for schools | 3.22 | 0.67 | A |
| 41 | Schools should regulate how students use social media and smartphones for classroom activities. | 2.39 | 0.90 | D |
| 42 | Internet services offered to staff and students should be upgraded | 3.49 | 0.73 | A |
| 43 | Provision of uninterrupted electricity supply to ensure continuous use of e-devices for teaching/learning | 3.43 | 0.72 | A |
| 44 | Schools at all levels should ban the use of smartphones/social media by students to avoid distractions. | 1.93 | 0.94 | D |
| Cluster 5 | | 2.98 | 0.42 | A |

Key: \bar{x} = Mean; SD = Standard Deviation; A = Agree; D = Disagree; Rmk = Remark



The results in Table 5 revealed the perceptions of the respondents on the perceived ways of promoting effective use of social media for academic purposes. The findings indicated that two items had their mean scores below 2.50 ($\bar{x} < 2.50$) representing “Disagree” while the remaining five items had means scores above 2.50 ($\bar{x} > 2.50$) representing “Agree”. However, the cluster 5 mean score of 2.98 indicates that the respondents agreed that the item statements in Table 5 are the perceived ways of promoting effective use of social media for academic purposes. From the results in Table 5, it was observed that the respondents disagreed with item 41 (Schools should regulate how students use social media and smartphones for classroom activities) and item 44 (Schools at all levels should ban the use of smartphones/social media by students to avoid distractions). In addition, the standard deviations presented in Table 5 ranged from 0.42 to 0.94 indicating that the respondents’ opinions were not far from one another.

Test of Hypotheses

This section presents the null hypotheses formulated for this study, which were tested at 0.05 level of significance.

HO₁: there is no significant difference between the mean responses of male and female Computer and Robotics Education students on the perceived influence of social media on their academic engagement.

Table 6: Summary of t-Test Analysis on the Mean Responses of Male and Female Computer and Robotics Education Students on the Perceived Influence of Social Media on their Academic Engagement.

| Gender | N | \bar{X} | SD | t | df | Sig. (2-tailed) | Rmk |
|--------|----|-----------|------|-------|----|--------------------|-----|
| Male | 54 | 2.83 | .502 | -.094 | 65 | .93 | NS |
| Female | 38 | 2.85 | .498 | | | | |

Key: \bar{x} = Mean; SD = Standard Deviation; Rmk = Remark; df = degree of freedom; NS = Not Significant

The data presented in Table 6 revealed that the p-value of .93 ($p > 0.05$) was obtained, indicating that gender does not significantly influence the perceptions of Male and Female Computer and Robotics Education Students on the use of social media for academic engagement. Therefore, the null hypothesis, of no significant difference, was upheld.

HO₂: there is no significant difference between the mean responses of male and female Computer and Robotics Education students on the perceived influence of social media on their academic collaboration.

Table 7: Summary of t-Test Analysis on the Mean Responses of Male and Female Computer and Robotics Education Students on the Perceived Influence of Social Media on their Academic Collaboration.

| Gender | N | \bar{X} | SD | t | df | Sig. (2-tailed) | Rmk |
|--------|----|-----------|------|-------|----|--------------------|-----|
| Male | 54 | 2.76 | .560 | -.271 | 65 | .79 | NS |
| Female | 38 | 2.80 | .475 | | | | |

Key: \bar{x} = Mean; SD = Standard Deviation; Rmk = Remark; df = degree of freedom; NS = Not Significant

The data presented in Table 7 revealed that the p-value of .79 ($p > 0.05$) was obtained, indicating that gender does not significantly influence the perceptions of Male and Female Computer and Robotics



Education Students on the use of social media for academic collaboration. Therefore, the null hypothesis, of no significant difference, was upheld.

HO₃: there is no significant difference between the mean responses of male and female Computer and Robotics Education students on the perceived influence of social media on their academic achievement.

Table 8: Summary of t-Test Analysis on the Mean Responses of Male and Female Computer and Robotics Education Students on the Perceived Influence of Social Media on their Academic Achievement.

| Gender | N | \bar{X} | SD | t | df | Sig. (2-tailed) | Rmk |
|--------|----|-----------|------|-------|----|--------------------|-----|
| Male | 54 | 2.79 | .441 | -1.31 | 65 | .20 | NS |
| Female | 38 | 2.96 | .513 | | | | |

Key: \bar{x} = Mean; SD = Standard Deviation; Rmk = Remark; df = degree of freedom; NS = Not Significant

The data presented in Table 8 revealed that the p-value of .20 ($p > 0.05$) was obtained, indicating that gender does not significantly influence the perceptions of Male and Female Computer and Robotics Education Students on the use of social media for academic achievement. Therefore, the null hypothesis, of no significant difference, was upheld.

Discussion of Findings

Table 1 revealed the findings on students' perception of the influence of social media use on their academic engagement. The findings revealed that through social media platforms, ideas and educational materials can easily be recommended and shared, there is an improvement in their study habits, assignments and projects are easily done, difficult concepts are easily analyzed and understood through active social media engagement, and commenting and liking comments of other, etc. The findings are in agreement with Kuh (2009); Reider (2020); and Alalwan (2022) who revealed that social media increase student engagement and participation in learning activities; and also provide a familiar and interactive environment for students. Damota (2019), Wordu et al. (2020), Dimari and Tyagi (2022), and Benedict et al. (2022) found out that social media sites facilitate instant online discussion, promote knowledge and content sharing, etc. According to Nwangwu et al. (2024), during the Covid-19 era, students and teachers to use social media platforms to post and discuss academic activities.

Table 2 revealed the findings on students' perception of the influence of social media use on academic collaboration. The findings revealed that students share their academic achievements with peers, have strong academic networks, execute class works collaboratively, know their classmates immediately after admission in the department, build strong partnership with peers for future endeavours, etc. These findings concurred with studies by Onuoha; Levine; Paul et al.; cited in Benedict et al. (2022), who revealed that modern social media applications facilitates social interaction to create connections with current, and prospective students. Other researchers (Agwi & Ogwueleka, 2018; Oguguo et al., 2020) found that social media creates an environment where increased critical thinking and collaboration are possible through creating and sharing knowledge among peers. The findings in Table 2 are also in agreement with Hershock and LaVaque-Manty (2012); Pang and Ji (2018); and Nguyen (2021), who found that students demonstrated significantly greater learning gains, in terms of recall of basic knowledge and critical thinking, when collaborating than when working independently.

Table 3 revealed the findings on students' perception of the influence of social media use on academic achievement. The findings revealed that responsible use of social media improves academic grades, facilitates completion of project-based learning activities, boosts the acquisition of IT practical skills, help in remembering answers to questions during exams, and in finding the best educational materials for preparing and passing exams. These findings are in agreement with Wordu et al. (2020)



who revealed that the use of social media platforms influenced the academic performance of university students in Rivers State. These findings also collaborated the study by Sivakumar (2020), Yadav et al. (2023); and Doe and Smith (2024), who revealed that students who have used social media for academic purpose have more academic performance than those that used it for non-academic purpose. Furthermore, the findings in Table 3 are in agreement with Alamri (2019); Altawalbeh (2021); Benedict (2022); and Mankani (2022), whose studies revealed that the use of preferred social media applications for assignment and preparing notes was shown to improve academic engagement and performance. The present findings also aligns with Ashraf et al. (2021), who revealed that the use of social media in education reinforces learning behavior and academic performance.

Table 4 revealed the findings on the factors that negatively affect effective use of social media for academic engagement, collaboration and achievement. These factors include social media addiction, distractions, junk posts, high cost of data subscription, poor internet connectivity, etc. The findings are in agreement with Yadav et al. (2023); Adelakun (2023); and Penguin (2024), who revealed the negative effects of social media on students' academic performance, to include distraction and interruption, cyberbullying and online harassment, sleep disturbances and physical health, lack of focus, among others. Yusuf et al. (2020), Boateng and Amankwaa (2021), Ofori et al. (2021), Ezeah et al. (2022), Amadu et al. (2023), Adelan (2023), and Penguin (2024) found out that the factors affecting the effective use of social media in education include distractions, poor internet connectivity, scamming, misinformation and fake news, poor time management, lack of digital literacy, spending more time on entertainment content than educational material, etc. Other researchers (Yadav et al., 2023; Adelakun, 2023; Mad Penguin, 2024) revealed the negative factors affecting the use of social media in the field of education to include health issues (such as obesity, eye problems, insomnia/sleeplessness) due to social media addiction; sharing of distractive materials (such as pornographic pictures or video clips); cyberbullying, and others.

Table 5 revealed the findings on the perceived ways of promoting effective use of social media for academic purposes. These include incorporating social media in the school curricular for effective instruction delivery, regular training of staff and students on innovative applications of social media in teaching and learning, improving internet services in schools, provision of uninterrupted electricity supply, etc. The findings are in agreement with Yadav et al. (2023), Mad Penguin (2024), and Adelakun (2023), who recommended verification of authenticity of information sources, ensuring effective time management in the social media for academic purposes, managing data privacy, balancing entertainment and academic rigour, etc. as ways of promoting effective use of social media for academic purposes. The results also agree with Nwangwu (2010), and Nwangwu et al. (2024), who recommended adequate provision of internet services as one of the major solutions to the use of online tools in teaching and learning. However, the findings also revealed that the respondents disagreed with the issue of schools regulating how students use social media and smartphones for academic purposes. This could be as a result of students having different learning styles and approaches to learning, and regulating their use of social media for classroom or school activities will hinder their freedom of expression and obstruct their learning peculiarities. Furthermore, the respondents disagreed with the issue of banning social media use in schools. This could be due to the fact that one of the challenges of the use of digital technologies in schools is bothered on irresponsible use. Once digital technologies are responsibly used for teaching and learning, students' academic collaboration, engagement and achievement will improve tremendously.

For the test of null hypotheses, the findings in Tables 6, 7, and 8 revealed that there were no significant differences in the means responses of computer and robotics education students on the perceived influence of social media on their academic engagement, collaboration and achievement respectively, based on gender. The findings revealed that female respondents had higher mean scores ($\bar{x} = 2.85$; $\bar{x} = 2.80$; and $\bar{x} = 2.96$) for academic engagement, collaboration, and achievement respectively when compared with mean scores of their male counterparts ($\bar{x} = 2.83$; $\bar{x} = 2.76$; and $\bar{x} =$



2.79). In support of these findings, previous studies revealed that females had higher mean scores in areas such as the use of computer training package for teaching and learning (Nwangwu, 2018); higher engagement in collaborative learning via social media (Chen & Fan, 2023); higher emotional engagement via academic WhatsApp groups (Nwachukwu et al., 2021; Umezulike & Nwagu, 2021); gender and social media engagement (Ifinedo & Kankaanranta, 2023); perceived usefulness of WhatsApp groups for group projects (Al-Rahmi et al., 2021), reciprocity in academic interactions (López et al., 2023), and others. On the contrary, other previous studies (Nwangwu et al., 2021, 2024; Alhabash & Ma, 2017) revealed that males had higher mean scores when compared with their female counterparts on software use for teaching and learning at different levels of education.

Conclusion

The present study determined the perceived influence of social media on Computer and Robotics Education students' academic engagement, collaboration and achievement. The findings of the study revealed that social media improve students' academic collaboration as it helped them participate actively in class activities, recommend and share ideas and educational materials, improve their study habits, facilitate the completion of assignments and projects, etc. On academic collaboration, the students were optimistic that through social media, they build strong relationship with classmates for future endeavours; and they use social media to collaboratively work on projects, and do assignments in real-time. On academic achievement, the findings of the study revealed that responsible use of social media improves academic grades, facilitate completion of project-based learning activities, boost the acquisition of IT practical skills, help in remembering answers to questions during exams, etc. The factors that negatively affect the use of social media for academic engagement, collaboration and achievement include social media addiction, distractions, junk posts, high cost of data subscription, poor internet connectivity, etc. On the way forward, developing guidelines/regulations on responsible use of social media in education; provision of uninterrupted electricity supply; and regular training/retraining of staff on new trends on social media use in the classroom, were highlighted.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. Curriculum planners should incorporate social media as tools for teaching and learning in the school curricular to improve the overall education delivery.
2. Federal and State Ministries of Education should organize and facilitate training and retraining programmes for teachers on the use of ICT for remote teaching and learning especially in this era of AI.
3. Parents and school authorities should encourage the use of digital devices by students for their learning. They should develop policies, rules and regulations guiding the responsible use of e-devices in schools.
4. Efforts should be made by the school administration to provide uninterrupted power supply and internet services to the university community to boost effective use of online digital tools for teaching and learning.



Limitations of the Study

The opinions of the students that were involved in the study may not represent the opinions of all Nigerian university students as the population for the study, was small. Secondly, the area of the study may not be compared with what is obtainable in bigger urban cities in Nigeria like Lagos, Abuja and Port-Harcourt, that are highly populated, industrialized and technologically inclined. In addition, it was somewhat difficult to convince some of the students to participate in the study as they alleged struggling to cope with their academic workloads.

References

- Abudabbous, N.F. (2021). Advantages and Disadvantages of Social Media and Its Effects on Young Learners. <https://ssrn.com/abstract=4002626>
- ACADEMIC PERFORMANCE. International Journal of Scientific & Engineering Research, 9(3), 1454-1462. <https://www.ijser.org/researchpaper/IMPACT-OF-SOCIAL-MEDIA-ON-STUDENTS-ACADEMIC-PERFORMANCE.pdf>
- Adelakun, N.O., Olajide, M.B., Shomoye, A. & Adebisi, K.L. (2023). The Significance of Social Media in Shaping Students' Academic Performance: Challenges, Benefits, and Quality Assurance Outlook. <https://informationmatters.org/2023/08/the-significance-of-social-media-in-shaping-students-academic-performance-challenges-benefits-and-quality-assurance-outlook/>
- Aforo, A.A. (2014). Impact of Social Media on Academic Reading: A Study at Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. Asian Journal of Humanities and Social Studies, 2(1), 92-99.
- Agwi, U.C. & Ogwueleka, F.N. (2018). IMPACT OF SOCIAL MEDIA ON STUDENTS'
- Ahmed, M., Dar, M., Tahir, R.M. & Masood, F. (2018). Impact of Social Media on Academics: A Quantative Study. 2018 International Conference on Computing, Mathematics and Engineering Technologies – iCoMET 2018.
- Aina'u, S., Gambari, A., Isiaka, A. & Abubakar, Z.S. (2016). Relationship between social media utilization and achievement of undergraduate students in North-Western Nigeria. ATBU, Journal of Science, Technology & Education (JOSTE), 4(3). <https://www.researchgate.net/publication/359370851>.
- Akambi, M. I. and Anyio, B. T. (2014). Influence of social media usage on self-image and academic performance among senior secondary school students in Ilorin West Local Government, Kwara State. *International Research Journal of Pure and Applied Physics*, 2, (4), 42-50.
- Alalwan, N. (2022). Actual use of social media for engagement to enhance students' learning. *Education and Information Technologies*, 27, 9767–9789. <https://doi.org/10.1007/s10639-022-11014-7>
- Alamri, M.M. (2019). Undergraduate Students' Perceptions toward Social Media Usage and Academic Performance: A Study from Saudi Arabia. *International Journal of Emerging Technologies in Learning (iJET)*, 14(3). 61-79. <https://doi.org/10.3991/ijet.v14i03.9340>
- Alhabash, S., & Ma, M. (2017). A tale of four platforms: Motivations and uses of Facebook, Twitter, Instagram and Snapchat among college students. *Social Media + Society*, 3(1), 1–13.
- Allen, S. 2019. Social media's growing impact on our lives. <https://www.apa.org/members/content/social-media-research>
- Al-Meneyes, J. J. (2015). Social media use, engagement and addiction as predictors of academic performance. *International Journal of Psychological Studies*, 7 (4), 1918-7211.
- Al-Rahmi, A. M., Shamsuddin, A., Alturki, U., Aldraiweesh, A., Yusof, F. M., Al-Rahmi, W. M., & Aljeraiwi, A. A. (2021). The influence of information system success and technology acceptance model on social media factors in education. *Sustainability*, 13(14), Article 7770. <https://doi.org/10.3390/su13147770>



- Altawalbeh, M.A. (2021). The impact of using social sites on academic performance for students at Jordanian Universities. *Turkish Journal of Computer and Mathematics Education*, 12(7), 3264-3270. <https://www.researchgate.net/publication/351133682>
- Ashraf, M.A., Khan, M.N., Chohan, S.R., Khan, M., Rafique, W., Farid, M.F. & Khan, A.U. (2021). Social Media improves students' academic performance: exploring the role of social media adoption in the open learning environment among international medical students in China. *Healthcare*, 9, 1-17. <https://doi.org/10.3390/healthcare9101>
- Backlinko (2024). Social Media Usage & Growth Statistics. Retrieved from <https://backlinko.com/social-media-users>
- Benedict, J.N., Ojo, O.M., Adelana, O.P. & Osisami, A.R. (2022). Preference and usage of social media applications among Polytechnic students in Ogun State, Nigeria. *Near East University Journal of Education Faculty (NEUJE)*, 5(2), 47-61.
- Bernard, K.J. & Dzandza, P.E. (2018). *Effect of Social Media on Academic Performance of Students in Ghanaian Universities: A Case Study of University of Ghana, Legon*. <https://www.researchgate.net/publication/323165156>
- Brindley, J. E., Walti, C., Lisa, M., and Blaschke, L. M. (2009). Creating effective collaborative learning groups in an online environment. *The International Review of Research in Open and Distance Learning*, 10(3), 1-18.
- Bryer, T. A. and Zavattaro, S. M. (2011). Social media and public administration: Theoretical dimensions and introduction to symposium. *Administrative Theory & Praxis*, 33 (3), 325-340.
- Carini, R. M., Kuh, G. D., and Klein, S. P. (2006). Student engagement and student learning: Testing the linkages. *Research in Higher Education*, 47(1), 1-32.
- Chen, C.-C., Hung, P. C. K., Egrioglu, E., Chiu, D. K. W., & Ho, K. K. W. (2023). Contemporary learning behaviors on mobile devices and social media [Guest editorial]. *Library Hi Tech*, 41(5), 1265–1274. <https://doi.org/10.1108/LHT-10-2023-589>
- Collin, P., Rahilly, K., Richardson, I. & Third, A. (2011) The Benefits of Social Networking Services: A literature review. Cooperative Research Centre for Young People, Technology and Wellbeing. Melbourne
- Damota, M.D. (2019). The Effect of Social Media on Society. *New Media and Mass Communication*, 78, 7-11. DOI: 10.7176/NMMC
- Datareportal (2024). Digital 2024: Nigeria. Retrieved from <https://datareportal.com/reports/digital-2024-nigeria>
- Dimari, A. & Tyagi, N. (2022). The impact that social media has on the educational system. *International Research Journal of Modernization in Engineering Technology and Science*, 4(10), 1298-1306. DOI: <https://www.doi.org/10.56726/IRJMETS30864>
- Doe, J. & Smith, J. (2024). The Impact of Social Media Usage on Student Academic Performance. <https://doi.org/10.12345/dummy-research-article>
- Edeh, S.C. (2022). Positive and Negative Effects of Social Media on Society. <https://bscholarly.com/positive-and-negative-effects-of-social-media-on-society/>
- Edwards, B.R. (2022). 9 Reasons Why Social Media Is Actually Good for You. Retrieved from <https://www.makeuseof.com/why-social-media-good-for-you/>
- Ellis, S. (2024). Top 10 Advantages of Social Media: Key Benefits. <https://www.theknowledgeacademy.com/blog/advantages-of-social-media/>
- Gaille, L. (2020). 23 Biggest Advantages and Disadvantages of Social Media. <https://vittana.org/23-biggest-advantages-and-disadvantages-of-social-media>.
- Ibrahim, L. (2012). Social media and its influence on students' performance. *Jamb News*, 3(21), 4-5.
- iCreative (2024). Exploring the Impact of Social Media on the Education And Development Of Nigerian Youth. <https://nigeriamag.com/exploring-the-impact-of-social-media-on-the-education-and-development-of-nigerian-youth/>



- Ifinedo, E., & Kankaanranta, M. (2021). Understanding the influence of context in technology integration from teacher educators' perspective. *Technology, Pedagogy and Education*, 30(2), 201–215. <https://doi.org/10.1080/1475939x.2020.1867231>
- Jabay, A. R. (2011). Effects of social networking sites on the study habits of the students [Unpublished term paper]. Mt. Moriah Christian Academy. https://www.termpaperwarehouse.com/essay-on/Effects-Of-Social-Networking-Site-To/50728?utm_source=chatgpt.com
- Kaplan, A. M. and Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. *Business Horizons*, 53(1), 59-68.
- King, D. L. (2012). Social media. American Library Association, Running the Digital Branch: Guidelines for Operating the Library Website. *Library Technology Reports*, Pp. 23-27.
- Kuh, G. D. (2008). *High impact practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities.
- Kuh, G. D. (2009). What student affairs professionals need to know about student engagement? *Journal of College Student Development*, 50(6), 683-706.
- Kuh, G. D., Cruce, T. M., Shoup, R., Kinsie, J. and Gonyea, R. M. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. *Journal of Higher Education*, 79, 540-563.
- Kuss, D. and Griffiths, M. (2011). Online social networking and addiction: A review of the psychological literature. *International Journal of Environmental Research and Public Health*, 8, 3528-3552.
- Larson (2024). Social Media Users 2024 (Global Data & Statistics). Retrieved from <https://prioridata.com/data/social-media-usage/>
- Lincoln Center Education (2023). The Impact of Social Media on Student Engagement and Learning. <https://lincolncentereducation.org/the-impact-of-social-media-on-student-engagement-and-learning/>
- López-Belmonte, J., Marín-Marín, J. A., Segura-Robles, A., & Moreno-Guerrero, A. J. (2023). Flipped learning for promoting self-regulation, social competence, and decision-making in pandemic conditions. *SAGE Open*, 13(4). <https://doi.org/10.1177/21582440231208772>
- Mad Penguin (2024). How does social media affect students' academic performance? Retrieved from <https://www.madpenguin.org/how-does-social-media-affect-students-academic-performance/>
- Mankani, R. (2022). Use of social media and its impact on academic performance of students in tier ii city of Gujarat State, India. *International Journal of Advance and Innovative Research*, 9(1), 29-36. <https://www.researchgate.net/publication/363654051>
- Mazman, S. G. and Usluel, Y. K. (2010). Modeling educational usage of Facebook. *Computers and Education*, 55,444-453.
- Mbachu, G. (2011,). Internet and declining reading culture in Nigeria. *Punch Newspaper*, July 27, pp.33.
- Mishnick, N. & Wise, D. (2024). Social Media Engagement: An Analysis of the Impact of Social Media Campaigns on Facebook, Instagram, and LinkedIn. *International Journal of Technology in Education*, 7(3), 535-549. <https://doi.org/10.46328/ijte.699>
- Montgomery, E. (2024). What is Student Engagement? Why it Matters. Retrieved from <https://classconnectpro.com/blog/student-engagement-importance>
- Naslund, J.A., Bondre, A., Torous, J. & Aschbrenner, K.A. (2020). Social Media and Mental Health: Benefits, Risks, and Opportunities for Research and Practice. *Technol Behav Sci.*; 5(3): 245–257. doi:10.1007/s41347-020-00134-x.
- Nguyen, M.H. (2021). The impact of social media on students' lives Case: LAB University of Applied Sciences. Retrieved from https://www.theseus.fi/bitstream/handle/10024/499169/Nguyen_My%20Hanh.pdf



- Nwachukwu, S. T., Ugwu, C. M., & Wogu, J. O. (2021). Digital learning in post COVID-19 era: Policy options and prospects for quality education in Nigeria. *Library Philosophy and Practice*. <https://digitalcommons.unl.edu/libphilprac/5122/>
- Nwangwu, E.C. (2010). Challenges and new responsibilities of computer education teachers in human capital development in Nigeria.” *Journal of Nigerian Educational Research Association*, 15 (1): 16–23.
https://www.researchgate.net/publication/380721190_Challenges_and_New_Responsibilities_of_Computer_Education_Teachers_in_Human_Capital_Development_in_Nigeria.
- Nwangwu, E.C., Obichukwu P., Uzuagu, A.U. & Omeh, C.B. (2020). Development of an interactive PowerPoint presentation design training package (IPDTP) for lecturers of tertiary institutions. *International Journal of Technologies in Learning*, 28 (2): 39–62.
<https://doi.org/10.18848/2327-0144/CGP/v28i02/39-62>.
- Nwangwu, E.C., Taoufik, E., Chukwuone, C.A., Ugwu, E.I. & Nwangwu, C.P. (2024). Stakeholders’ Perception of Multimedia Technologies and Online Learning in Early Childhood Care and Education during the COVID-19 Era. *The International Journal of Early Childhood Learning*, 31(1), 25-58. <https://doi.org/10.18848/2327-7939/CGP/v31i01/25-58>
- Oguguo, B.C.E., Ajuonuma, J.O., Azubuike, R., Ene, C.U. Atta, F.O. & Oko, C.J. (2020). Influence of social media on students’ academic achievement. *International Journal of Evaluation and Research in Education (IJERE)*, 9(4), 1000-1009. DOI: 10.11591/ijere.v9i4.20638
- Ogunbukola, M. (2024). The Role of Social Media in Education: Distraction or Educational Tool? <https://www.researchgate.net/publication/384107388>
- O'Reilly, T. (2007). What is web 2.0: Design patterns and business models for the next generation of software. *Communications & Strategies*, 65(1)17-37.
- Pang, J. & Ji, Z. (2018). The Effects of Social Media Use on School Learning: Evidence From PISA 2018. The official conference proceedings of the IAFOR International Conference on Education in Hawaii 2023. Retrieved from https://papers.iafor.org/wp-content/uploads/papers/iice2023/IICE2023_67315.pdf
- Raju, G. (2024). Importance of Social Media | Benefits of Social Media in 2025. <https://www.simplilearn.com/importance-of-social-media-in-todays-world-article>
- Reider, J. (2020). Engaging Students with Social Media. Retrieved from <https://hub.fullsail.edu/articles/engaging-students-with-social-media>
- Shoshani, Y. and Rose Braun, H. (2007). The use of the internet environment for enhancing creativity. *Educational Media International*, 44(1), 17-32.
- Sivakumar, R. (2020). Effects of social media on academic performance of the students. *The Online Journal of Distance Education and e-Learning*, 8(2), 90-97.
https://www.researchgate.net/publication/341270933_EFFECTS_OF_SOCIAL_MEDIA_ON_ACADEMIC_PERFORMANCE_OF_THE_STUDENTS
- Statista (2024a). Most used social media platforms in Nigeria as of the 3rd quarter of 2023. Retrieved from <https://www.statista.com/statistics/1176101/leading-social-media-platforms-nigeria/>
- Tarantino, K. and McDonough, J. (2014). Effects of student engagement with social media on student learning: A Review of Literature. Retrieved on 15 June 2014 *From http://studentaffairs.com/ejournal/Summer*.
- Tayo, S. S., Adebola, S. T., & Yahya, D. O. (2019). Social Media: Usage and Influence on Undergraduate Studies in Nigerian Universities. *International Journal of Education and Development using Information and Communication Technology*, 15(3), 53-62.
- Tiryakioglu, F. and Erzurum, F. (2011). Use of social networks as an education tool. *Contemporary Educational Technology*, 2, 135-150.
- Umezulike & Nwagu (2021): Extent of Utilization of WhatsApp for Enhancing Academic Learning by Business Education Students in Anambra State, Nigeria. *The International Journal of Humanities & Social Studies*, 9(4). <https://doi.org/10.24940/theijhss/2021/v9/i4/HS2104-056>



- Valentine, M. (2020). 5 Positives of Social Media: Why Social Media Is Good for Us. <https://technologyformindfulness.com/positives-of-social-media/>
- Wawrzynskin, M. R., Heck, A. M. and Remley, C. T. (2012). Student engagement in South African Higher Education. *Journal of College Student Development*, 53(1), 106-123.
- Wickramanayake, L. & Jika, S.M. (2018) "Social media use by undergraduate students of education in Nigeria: a survey", *The Electronic Library*, Vol. 36 Issue: 1, pp.21-37, <https://doi.org/10.1108/EL-01-2017-0023>
- Wordu, H., Uchendu, G. & Alabo, M. (2020). Influence of Social Media on University Students' Academic Performance in Rivers State, Nigeria. *Direct Research Journal of Education and Vocational Studies*, 2(3). DOI: <https://doi.org/10.26765/DRJEVS60128093753>
- Yadav, R.S., Rao, P.B. & Suresh, C.K. (2023). Impact of social media on the lives of students. *International Journal of Advance Research and Innovative Ideas in Education*, 9(6), 1949-1956. <https://www.researchgate.net/publication/379049376>