STUDENTS' PERCEPTION OF THE INFLUENCE OF SOCIAL MEDIA ON ACADEMIC PERFORMANCE IN MATHEMATICS IN FEDERAL COLLEGE OF EDUCATION KONTAGORA - NIGER STATE

By
Dr. Umaru S Momozoku, Abdulmalik O Audu And Dr. Olorunsola O Niyi

DEPARTMENT OF MATHEMATICS, SCHOOL OF SECONDARY EDUCATION (SCIENCE PROGRAMMES), FEDERAL COLLEGE OF EDUCATION, KONTAGORA- NIGER STATE.
emozoku@yahoo.com

Abstract

This paper reports on Students' Perceptions of the Influence of Social Media on Academic Performance in Mathematics at Federal College of Education in Kontagora-Niger State. A cross-sectional survey research design was adopted. The population of the study comprised all NCE and undergraduate mathematics students in the school of secondary education (science programmes), Federal College of Education Kontagora- Niger State. Samples for the study comprised one hundred and seventy-five NCE students; and one hundred and thirty undergraduate mathematics students were randomly selected for the study. Four research questions and two hypotheses guided the study. A Structured questionnaire labelled Social Media Questionnaire was used for data collection. The questionnaire was validated by one expert in Mathematics education and two experts in ICT with a reliability coefficient of 0.687. Means, percentages and t-test statistic were used to analyzed the data collected. Finding of the study reveals that above 55% of the respondents engage on social media using Facebook and Whatsapp through smartphones and laptops mainly for educational purposes. Results of the study revealed that there is a significant difference in the response of NCE and undergraduate mathematics students as regards the influence of social media on their academic performance; and that there is no significant difference in the response based on the gender as regards to the influence of social media on their educational pursuit. It is recommended that students should be educated on how to maximize the potential of the different social network sites for their academic benefits.

Keywords: Social Media, Performance, Social Networking sites and Internet

Introduction

The process of learning mathematics requires a lot of efforts from the cognitive which if not properly coordinated leads to failure and poor performance. The learning environment is one of the causes of failure and poor performance as

such students need to be motivated to cope with the subject. Bernd and Martin (2015) strongly points out the importance of technology in the teaching and learning of mathematics and advised that teachers and students should explore the opportunities of the latest technologies to improve their learning styles. Ronan (2015) affirmed that meaningful learning occurs when students are engaged in various social activities such as social media.

Social media is defined as a web-based application for people to exchange information and build relationships as well as maintain their collaborative communication and cooperation (Abirin & Obra, 2019). Social media refers to internet-based technologies that allow individuals to create, discuss, and adapt user-generated content. It can provide the building blocks for a learning environment powered by multiple forms of support, allowing learners to connect, interact, and share ideas in a fluid way.

Social networking sites allow students to express themselves, collect profiles that highlight their talents and experience; and communicate (Helou & Ab.Rahim, 2014). The most popular social networking sites are Facebook, WhatsApp, email, Khan academy, yahoo, google, LinkedIn, Pinterest, Instagram and Twitter (Pew Research Center,2015 & Abdulkareem, 2015). Social networking is the creation of virtual environments to complement traditional learning which is significant to promote and strengthen teacher-student and student-student interactions in sharing knowledge and cooperative work.

Social media is an effective means of increasing students' engagement and acquiring better communication skills among teachers and students. Communication is very essential for transferring and accessing information. Social media exist to provide communication among people regardless of the distance, making it easy for people to share information, files, pictures, videos, create blogs, send messages and conduct real-time conversations (Fatokun, 2019). Science educators can answer students' queries through social networking sites by posting homework, sending messages and updates, announcing upcoming events, and sharing interesting school-related content since students already collaborate, search for information, communicate and socialize using web-based technologies as part of their everyday lives (Abdulkareem, 2015). An interesting aspect of social media is that, it is not limited to desktop or laptop computers but could be accessed through mobile devices, including mobile phones, personal digital assistants (PDAs), tablet PCs and smart phones making it very accessible and easy to use. Mobile devices enhance anytime and anywhere learning, providing access to learning resources, even outside the school. This flexibility makes it possible for young learners to minimize their unproductive time, which may enhance their educational activities (Ronan, 2015).

The driving factors for the adoption of social media are accessibility, convenience, functionality and flexibility of social technologies. Social technologies provided on the internet are usually free or require marginal

investment, eliminating a potential barrier to their adoption in education. The impact of social media on students' achievement at all levels of learning has been one of the concerns of academicians (Fatokun, 2019).

Academic excellence or achievement is the key to an individual's placement be it in the academic institution or professionally. Due to this, many are concerned with the ways they can easily acquire knowledge through enhanced learning for heightened life attainments and employability in their career, social media serves as an inevitable consonant for achieving this and sustaining interest if properly utilized (Abdulkareem, 2015 and Fatokun, 2019). Students can transmit research materials and disseminate papers and analyses to those working on that activity to buttress this stance for this is possible because of the flexible learning it offers (Mensah & Nizam, 2016).

Flexible learning expands choice on what, when, where and how people learn. Social media is easy and quick in terms of accessibility, reviewing, updating, and editing; anytime, anywhere. Scholars praise social media for its capability to attract, motivate and engage students in meaningful communicative practice, content exchange, and collaboration (Fatokun, 2019).

The benefits of these websites promote education, keep students updated with assignments, offer help to those in need, provide an outlet for teens to express themselves. In general, the Internet and social networking sites can be a positive influence (Ranaweera, 2015). Social media usage in tertiary institutions has many advantages which includes enhancing relationship, improving motivation, offering personalized course material and developing collaboration abilities. This means social media have the ability to improve students' participation in class, particularly where introverted students are involved. Students can function in online groups learning with less or no anxiety of needing to raise questions before peers at school. A direct relationship exists between social media usage and the academic performance of university undergraduate students (Habes, Alighizzawi, Khalaf & Sudoum, 2018 and Isyaku, et al, 2020).

According to Upadhayay and Guragain (2017), students who use social networks and the internet more than average had poor academic achievement and low level of concentration in the classroom. Al-Yafi, El-Masri and Tsai (2018) observed that students grade point average (GPA) was lower among students who were addicted to social networking compared to others. In addition, Sandeep, Chaudhury and Hazra (2019) maintained that social media have positive (improved) impact on academic performance. Mental Daily (2019) stated that below-average students who exhibit excessive social media use were linked to decrease academic performance; for students with lower academic achievement, the use of social media replaces study time, whereas high achieving students can juggle both. Higher academic achievement is linked to less preoccupation with social media.

Ahmad, Gambari and Abubakar (2016) maintained that social media utilization has no significant relationship with undergraduate students' gender.

Seyyed, Ali and Alireza (2019) submitted that mean social media addiction was higher in male students (52.65) than in female students (49.35) and this difference was statistically significant (p<0.01). There was a negative and significant relationship between students' addiction to social networking and their academic performance (r=-0.210; p<0.01). in another study, Kolan and Emefe (2018) stated that the influence of social media was negatively related to students' academic performance at (r=-; p=0.01) while gender was positively related to students' academic performance at (r=0.18; p<0.01) and concluded that gender predict students' academic performance.

There are many challenges facing the use of social networking in education such as privacy, real friendship, taking up time, flexibility, repeatability, convenience and accessibility and miscommunication. Social networking affect health of individuals, due to spending a lot of time on the internet. With so many social networking sites displayed on the internet, students are tempted to abandon their assignments and reading schedule in preference to chatting online with friends as well as some who are now addicted to the online rave of the moment with Facebook, WhatsApp, Twitter and so on (Fatokun, 2019 and Bamigboye & Olusesan, 2017).

Leyer-Jackson and Wilson (2018) maintained that there will be a detrimental effect, as there will interference with their academic activities. Researches show that heavy users of social media plat-forms received lower grades compared to light users. Jegede (2015) noted that youths cannot go for 2-3 hours without checking and updating their profiles on social media even at the detriment of other activities such as education or career pursuit. Mensah and Nizam (2016) while looking at the time spent on social media and its effect on academic performance made a similar remark. This is because instead of their books, they spend more time chatting and making friends via social media which negatively affects their academic performances. Therefore, this study is to investigate students' perception of the influence of social media on the academic performance in mathematics in Federal College of Education Kontagora - Niger state.

Research questions

The following research questions were posed to guide the study:
1. How exposed are you to social media?
2. Which of these social media platform do you frequently access and have account with?
3. What type of technology do you use to access social media?
4. What type of data connection do you use in accessing social media?
5. What is the influence of social media on academic performance of mathematics students?

Research hypotheses

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

Ho$_1$: There is no significant difference in response of NCE and Undergraduate students as regards to influence of social media on their academic performance

Ho$_2$: There is no significant difference in mean response by gender of NCE and Undergraduate students as regards to influence of social media on their educational pursuit

METHODOLOGY

The design adopted for this study was a cross-sectional descriptive survey. This choice was made to collect data from uniform subjects running different programmes in the same institution within a uniform time. The population of the study comprised all NCE and Undergraduate mathematics students from the school of secondary education (science programmes) in Federal college of education, Kontagora-Niger state.

Sample and Sampling Techniques

Stratified random sampling was employed to obtain three hundred and five student teachers (NCE and undergraduate) which constituted the sample for the study. One hundred and seventy-five NCE and one hundred and thirty undergraduate mathematics students respectively were randomly drawn through balloting from the two groups making a total of three hundred and five.

Instrumentation

A structured questionnaire tagged "Social Media Questionnaire" was used for data collection. Part A was concerned with personal information of the respondents. Part B was concerned with what students use social media for, positive influence of social media on academic performance. The questionnaire used was validated by three experts in computer. A pilot test was conducted to determine the reliability of the instrument and a reliability coefficient 0. 687 were obtained.

Method of data collection and analyses

Questionnaires were administered to sampled NCE and Undergraduate mathematics students and were retrieved immediately. The questionnaires were collated and data obtained from the respondents were analyzed using frequency count and percentages to answer the research questions and hypotheses were answered using t-test statistic.

Results

All data collected through questionnaire were analyzed as presented in tables below. Tables 1-5 were analyzed using percentages to answer the research question while t-test statistic was used to answer the two null hypotheses as presented in tables 6 and 7.
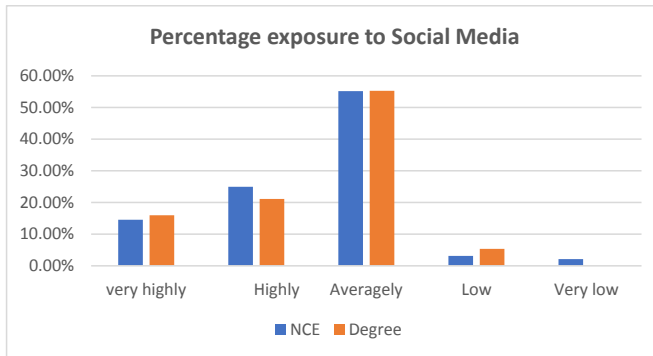
Research Question 1: How exposed are you to social media?

Table 1: *Responses to how exposed are the respondents in percentages to social medi*

Respondent	Very Highly	Highly	Averagely	Low	Very low

|	very highly	Highly	Averagely	Low	Very low
NCE	14.58%	25.00%	55.21%	03.13%	02.08%
Undergraduate	15.96%	21.13%	55.32%	05.32%	

Result on table 1 and component bar chart reveals the level of exposure of respondents to social media. 14.58% of NCE and 15.96% of Undergraduate were very highly exposed, 25.00% of NCE and 21.13% of Undergraduate were highly exposed, 55.21% of NCE and 55.32% of Undergraduate were averagely exposed while 03.13 of NCE and 05.32% have low exposure to social media.

Research Question 2: Which of these social media platform did you frequently access and have account with?

Table 2: *Responses in percentages of platforms frequently used in accessing social media*

Respondent	Facebook	Email	Twitter	Blogs	Whatsapp	Google	YouTube	Yahoo	Others
NCE	46.36%	9.94%	3.97%	0.66%	26.49%	17.88%	05.96%		1.99%
Undergraduate	27.66%	12.77%	02.13%	04.26%	28.72%	24.47%		1.06%	

Percentage usage of various Social Media Platforms
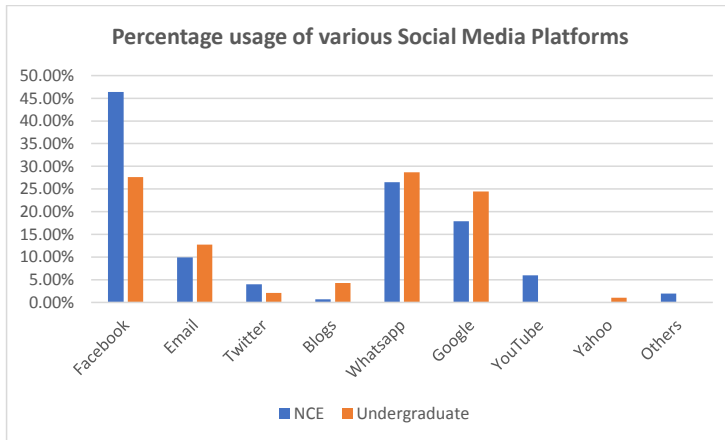
Based on the results from table 2 and component bar chart on the frequently used platform in accessing the social media by respondents, 46.36% of NCE and 27.66% of Undergraduate uses face-books,9.94% of NCE and 12.77% of Undergraduate uses emails, 26.49% of NCE and 28.72% of Undergraduate uses whatsapp, 17.88% of NCE and 24.47% of Undergraduate uses googles while 03.97% of NCE and 02.13% of Undergraduate uses twitters. The most commonly used platforms in accessing social media are facebook, whatsapp, googles and emails.

Research Question 3: What type of technology do you use to access social media?
Table 3: *Responses in percentages of device frequently used in accessing social media*

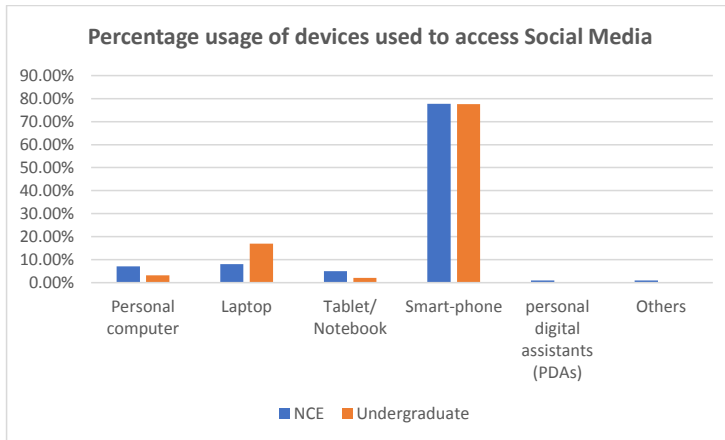| Respondent	Personal computer	Laptop	Tablet/ Notebook	Smart-phone	personal digital assistants (PDAs)	Others
NCE	07.07%	08.08%	05.05%	77.78%	01.01%	01.01%
Undergraduate	03.19%	17.02%	02.13%	77.66%		

Table 3 and component bar chart presents the devices being used by the respondents in accessing social media. It shows that 77.78% of NCE and 77.66%of Undergraduate uses smart-phones; 08.08% of NCE and 17.02% of Undergraduate uses laptops, 07.07% of NCE and 03.19% of Undergraduate uses personal computers; 05.05% of NCE and 02.13% of Undergraduate uses tablet/notebook. These data show that students have a great preference in using their smart-phones over any device to access social media platforms.

Research Question 4: What type of data connection do you use in accessing social media?

Table 4: *Responses in percentages of data connection frequently used in accessing social media*

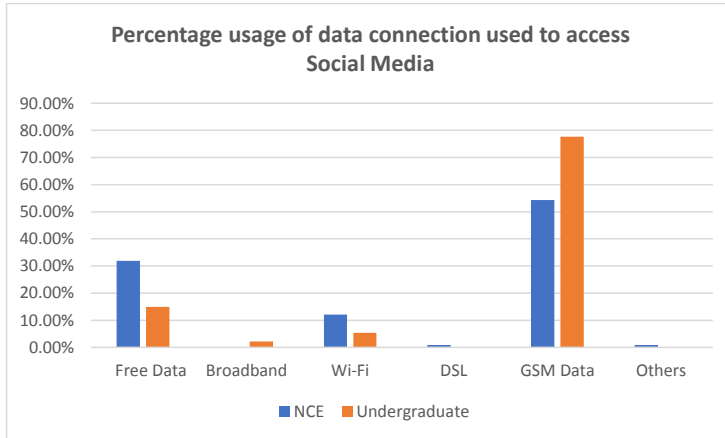| Respondent	Free Data	Broadband	Wi-Fi	DSL	GSM Data	Others
NCE	31.90%		12.07%	0.86%	54.31%	0.86%
Undergraduate	14.89%	02.13%	05.32%		77.66%	

Table 4 and component bar chart showed that 54.31% of NCE and 77.66% of Undergraduate uses GSM Data; 31.90% of NCE and 14.89% of Undergraduate uses Free Data while 12.07% of NCE and 05.32% of Undergraduate uses Wi-Fi connections respectively to connect to social media. This shows that respondents prefer to buy GSM data in accessing social media.

Table 5: *Responses in percentages of those who use more than one platform; devices and data connections in accessing Social Media*

	Platforms	**Device**	**Data connections**
Respondent	45.74%	14.89%	19.15%

From table 5, 45.74% uses more than one platform to access social media, 14.89% uses more than one device to access social media and 19.15% uses more than one data type in accessing social media.

Ho₁: Ho_1: There is no significant difference in response of NCE and Undergraduate students as regards to influence of social media on their academic performance

Table 6: *t-test analysis of responses of NCE and Undergraduate students as regards to influence of social media on their academic performance*

Respondent	N	Mean	St.dev	Df	Mean diff	t-stat	P	Decision
NCE	175	80.28	8.7782					
				303	4.19	3.636	0.0004	Reject Ho
Undergraduate	130	84.47	6.9034					

From table 6, it can be deduced that there is statistical difference in response as p=0.0004 is less than p<0.05 as such reject the stated null hypothesis. This implies that there is a significant difference in the response of NCE and Undergraduate students as regards the influence of social media on their academic performance.

Ho2: Ho2: There is no significant difference in mean response based on the gender respondents as regards to influence of social media on their educational pursuit

Table 7: *t-test analysis of mean responses based on the gender as regards to influence of social media on their educational pursuit*

Gender	N	Mean	St.dev	Df	Mean diff	t-stat	P	Decision
M	189	82.78	8.297					
				303	0.21	-0.971	0.3327	Retain Ho
F	116	81.57	7.899					

Table 7 showed that there is no statistical difference in response as p=0.3327 is greater than p<0.05. retain the stated null hypothesis. This implies that there is no significant difference in the response based on the gender as regards to influence of social media on their educational pursuit.

Discussion

The result of the study revealed that there is a significant difference in the response of NCE and Undergraduate students as regards the influence of social media on their academic performance. In support of this, Upadhayay and Guragain (2017) stated that students who use social networks and internet more than average had poor academic achievement and low level of concentration in the classroom. Al-Yafi, El-Masri and Tsai (2018) observed that students grade point average (GPA) was lower among students who were addicted to social networking compared to others. In addition, Sandeep, Chaudhury and Hazra (2019) maintained that social media have positive (improved) impact on academic performance. Mental Daily (2019) stated that below average students who exhibit excessive social media use were linked to decrease academic performance; for students with lower academic achievement, the use of social media replaces study time, whereas high achieving students can juggle both. Higher academic achievement linked to less preoccupation with social media.

In another finding of the study, it was found that that there is a no significant difference in the response based on the gender as regards to influence of social media on their educational pursuit. This is in line with the study of Ahmad, Gambari and Abubakar (2016) that social media utilization has no significant relationship with undergraduate students' gender. Seyyed, Ali and Alireza (2019) submitted that

mean social media addiction was higher in male students (52.65) than in female students (49.35) and this difference was statistically significant (p<0.01). There was negative and significant relationship between students addiction to social networking and their academic performance (r=-0.210; p<0.01). in another study, Kolan and Emefe (2018) stated that the influence of social media was negatively related to students' academic performance at (r=-; p=0.01) while gender was positively related to students' academic performance at (r=0.18; p<0.01) and concluded that gender actually predict students' academic performance.

Conclusion

Presently, the infrastructure for accessing the internet by students is available and handy. From the study, it is apparently that smart phones are the best possible device to enhance the use of social media in education, where majority of the respondents have smart phones as most of the respondents have accessibility to internet at home and everywhere using tools like facebook, whatsapp, emails. Social media has positive influence on the academic performance of students in sciences if properly utilized.

Recommendations

The researchers made the following recommendations based on the findings;

- Science students should be educated on how to maximize the potential of the different social network sites for their academic benefits.
- Teachers should ensure that they use social media as a tool for improving learning and promoting the academic performance of students in the tertiary institutions.
- Students should create a balance between academic and non-academic activities on social media by focusing mainly on the academic relevance of most sites instead of engaging in unprofitable surfing.
- Platform owners should protect social media users' privacy and allow users the opportunity to sort their groups to avoid distractions.
- Teachers should train the students on the use of social media to enhance their abilities to use available internet devices properly.

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