



Enhancing Students' Academic Achievement in Stem Education Using Available Social Media Platforms in the Post Covid 19 in Kogi State Nigeria

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Abstract

The paper examines how to enhance the students' academic achievement in STEM Education using available social media platforms(SMP) in the post Covid 19 era in Kogi State. The study adopted descriptive survey research design and was guided by two research questions and one null hypothesis. The population comprised all the NCE students and lecturers in public and private Collages of Education in Kogi State. A sample size of 1550 were selected using simple random sampling technique. A questionnaire with internal constituency of 0.84 calculated using Cronbach alpha was used for data collection. Data collected were analyzed using mean, standard deviation and t-test. The findings of the study revealed that students and lecturers use SMP for learning, socializing, discussing and facilitating academic activities among others. Based on the findings, it was recommended that school management should provide Wifi and ICT facilities to students and lecturers to explore blended teaching and learning approach among others.

Keywords: Achievement, STEM, SMP, face –to-face strategy blended teaching and post COVID-19 Era.

Introduction

This Era of post covid-19 pandemic, has affected all the sectors of the country's economy including Education which has been described as a child of progress and instrument of human civilization in the society. This is because during the era of Covid 19 pandemic schools were lockdown and all academic activities were shutdown. Therefore, there is a need to plan, strategize and organize institutional and educational apparatus in order to recover our loss ground in education due to the pandemic and to put in place effective and efficient instrument, should such pandemic or the like surfaces again, now or in the near future. Covid-19 was declared a pandemic by the World Health Organization (WHO, 2020) because of its contagious nature and transmission from person to persons and one country to another. Thus, the sudden spread of covid-19, sparked alarm throughout the entire world, leading to the World Health Organization (WHO) declaring this rapidly spreading disease a pandemic. In Nigeria the centre for Disease Control (NCDC, 2020) has advocated for the prevention of this wild and rapidly spreading disease by recommending and encouraging physical distancing, frequent washing of hands, wearing of face mask in the public as well as vaccination to aid the control of this contagious disease. Meanwhile Scientists are still exploring ways to arrive at a permanent cure of the pandemic.

This pandemic has affected all the sectors of the country's economy including education, in which science, technology, engineering and mathematics (STEM), being an arm of education is also affected. Therefore, there is a need to plan and factor out effective and efficient instructional strategies that can help recover our lost-ground educationally in this post covid-19 era and arm ourselves, should such wild and diverstating pandemic surfaces again in the near future via research process. Hence a need to consider how to utilize social media platforms to enhance students' academic achievement in STEM education in post covid-19 era. Science, technology, engineering and mathematics (STEM) Education, literarily means the act of imparting Science, technological engineering and mathematical knowledge, competencies and skills for personal survival and overall development of the society (Aledare,2019). STEM according to Abuh (2019) is an acronym that stand for science, technology, engineering and mathematics. Akpan (2020) opined that stem is a knowledge that is socially relevant and is proper implemented through a multiplicity of approaches. STEM education has become an important area of focus in developmental planning all over the world because of its role in the overall development of any nation (Fadzill, 2014). The development of any nation like ours is based on her Science, Technology, Engineering and Mathematics Education. This is because it is the pivot upon which



technological advancement revolves and is fundamental to the capacity building and self-reliant of any nation. STEM subjects are inter-related and inter dependent. The inter-related and inter-dependent nature of STEM is such that, it flows together and is integrated into one entity called “Science Education” whose principles and structures are anchored in Mathematics (Okorochoa, 2016). STE M Education is of great importance because it contributes to general Educational development and practices.

The important contribution of STEM as an enabler for sustainable national economic growth was affirmed at the world summit on sustainable Development (WSSD) in 2002. According to David, Dallatu and Yusuf (2018) in Aledare (2021), it is in this regard that the framework of the New partnership for Africa’s Development (NEPAD) was formulated. By this, African Leaders recognized that STEM plays a major role in the economic transformation and sustainable development of any nation. STEM education is used in research, policy issues, teaching for innovation, problem solving and prospects. STEM is needed towards globalization demands. The complexity of today’s world required all people to be engaged with new set of core knowledge and skills, to solve difficult problems like novel coronavirus pandemic, through gathering and evaluation of evidences and make sense of information they receive from varied prints and increasingly digital media. The learning and doing of STEM help develop skills and prepare students for a workforce where success results, not just from what one knows but what one is able to do with the knowledge. STEM had been the critical instrument used to uplift not only the standard of living but the economy of any nation. Developed nations such as USA, China, Japan and UK are not unconnected to the type of Science and technology available to them (Achor, 2019). STEM education is important in meeting societal needs in areas of food, shelter, clothing, water, energy, employment, Basic Education, health care, defense and security, and governance, etc. Modern industries depend on STEM for its supply of innovations.

Despite all these importance of STEM Education, students perform poorly in subjects or disciplines leading to acquisition of STEM Education. Students perform poorly in such subjects like physics, chemistry, biology, mathematics as documented in the chief Examiner’s report of West Africa Senior secondary school certificate examination, (WASSCE) from 2011-2021. Statistics of the results in Nigeria by

subjects and grade revealed low enrolment and poor achievement by students in STEM related subjects (WAEC Chief Examinees’ report, 2011-2021). From the analysis, it is clear that there is a trend of poor academic achievement and therefore calls for more attention. This poor academic achievement could be as a result of the influence in the social media handles. This has made a number of Science educators in the country like Abdulganry (2011); Gabriel and Fehintela (2015); Orji and Abiola (2018) and Ifidou (2019) to study the poor academic achievement of students empirically with the hope of finding causes and possible solutions.

According to Ryder (2015), achievement can be defined as the act of accomplishing a task well. In the study, student’s achievement in STEME depends on extent and frequency of that usage of social media for academic exploit. This is because student’s achievement is dependent on their access to learning materials (on-line or off line) and their level of understanding of the concepts being discussed. Students that neglect the use of social media to access learning materials may not perform well in both examinations conducted in the school and external bodies like West Examination Council (WAEC) and National Examination Council (NECO). This is because student academic success depends on their ability to read and access reading materials. Student’s achievement is a major determinant of the success or failure in an academic programme.

Some of the causes of failure identified are students’ poor knowledge of the use of social media platform devices like WhatsApp, smart phone, students not exploring the option of the use of social media to revive academic resources and lack of data, attitude of students in the usage of social media handle for social interaction rather than academic learning in exploring learning resources (Timayi, Ojogba & Ishaku, 2021). Hence there is need to diversify from the use of face-to-face method to Smp approach or adopt blended method in the teaching of STEM for an enhanced achievement. Face-to-face method makes students depend on teacher for informal idea and educational activities. It also confines students to one classroom and face-to-face application without the use of technological tools or devices. While Blended method which involves the use of both face to face and SMP encourages students’ interaction with teachers and use of technological tools or devices.

Social media are interactive technologies and digital chances that facilitate learning, creation and



sharing of information, ideas, interest and other forms of expression through virtual communications and networks. Social media is a computer based technology that facilitates the sharing of ideas, thoughts, and information through the building of virtual network (Crompton & Lee 2013) According to Crompton and Lee (2018), the features of social media are interactive internet based applications, user generated content such as text posts or comments, digital photos or videos and data generated through all online interactions in the life blood of social media which enhances learning.

Some of the most popular social media websites with more than 100 million registered users, include face book, whatsAap, twitter users, social networking, video sharing, interactive media and blogging, and community Building among others. These Social media platforms can be used as medium for teaching and learning especially in the post covid-19 era, where a lot of gap had been created due to shutdown of academic activities during covid-19 pandemic.

STEM students in Nigeria just like their counter parts worldwide use smart phones and other handheld devices that allow them explore various social media platforms such as the face book, Whatsapp, twitter etc. for various purposeS. Available literature shows that there are many benefits students derive worldwide which include the following, students and teachers use them for educational purposes, academic communication and information sharing (Gado, 2017). Social media as avenue for socializing with peers and as collaborative tools for sharing and exchanging information (Yusuf, 2016). Students prefer being present everywhere at once, learning via social media platforms than the face-to-face learning methods. It was observed that social media platform impacts students' learning and academic achievement positively than face-to-face teaching and learning method (Udoada, 2014) In addition, study by Okegbile and Ofomata (2017) found that SMP is suitable information delivery medium to support corresponding learning activities in a mobile learning environment. This makes it a stepping stone to enhancing students' academic achievement. study by Timayi, Majiyebo and Ishaku (2021) showed that students and lecturers use the social media platform (whasapp) for learning, communication, discussion, interaction and as aid to study. On the contrary study by Francis (2019) revealed that students' exposure or access to social media networking sites affect their academic performances. That unlimited access to

social media through cell phones has negatively affected academic work. The study further revealed that addiction to social media has serious negative impact on students' academic performance. And that Engaging students on academic forums on social media often leave many students confused. Hence there is a need to carry out this study to determine whether SMP has negative or positive impact on academic achievement of students as a gap to be filled. Therefore, the statement of the study put in question form, what is the influence of social media platform in enhancing student's achievement in STEM education in the post covid 19 Era in Kogi State, Nigeria.

In line with the gap, the purpose of the study was to examine how to enhance students' academic achievement in STEM education using available social media platforms in post Covid19 era in Kogi State. The specific objectives were to;

1. determine the purpose of social media platform
2. find out the extent of usage of social media among students and lecturers
3. determine the perception of students and lecturers on social media platform and face to face strategy

Based on the purpose, the following research questions were raised;

1. what is the purpose of social media platform among students and lecturers in post Covid-19 era in Kogi State?
2. what is the extent of utilization of social media platform among students and lecturers in teaching and learning of STEM Education in the post of covi-19 Era in Kogi State?
3. what is the perception of students and lecturers on social media and face-to-face strategies in enhancing teaching and learning of STEM Education in the post of covid-19 Era in Kogi State?

A null hypothesis was formulated and tested in line with purpose of the study at $p \leq 0.05$ level of significance:

1. There is no significant difference in the mean response of students and Lecturers on ways of enhancing teaching and learning of STEM Education via social media platform and face to face strategies in the post covid-19 Era in Kogi State.

Method

Descriptive survey research design was adopted in this study. The estimate population of the study is 15,550 comprised all the NCE Students and lecturers in public and private colleges of Education in Kogi State. The choice of the area of the study is to check the trend of the social media platform usage in teaching and learning especially in this post Covid 19 pandemic era, is an educationally disadvantage state. A sample size of One thousand and five hundred (1,500) students and fifty (50) lecturers were selected through a simple random sampling technique. The instrument used for data collection was a questionnaire designed and validated by the researchers in measurement and evaluation and Science Education, tagged “Extent of Social Media Platform Usage by Students And Lecturers Questionnaire” (ESMPULQ) was used to elicit information from the students and lecturers. The criticism and suggestions of the experts were accommodated in the final draft-of the instrument before the administration of the questionnaire. The questionnaire was structured based on the 4- point likert type with scale responses of strongly agrees (SA), Agree (A)disagree (D)and strongly disagree (SD). This was scored 4,3,2, and 1 respectively.

consequently, a mean score of 2.5 was obtained from the score as a bench mean score for which all items having a score greater than or equal to 2.5 (< 2.5) were accepted and items with mean less than 2.5 (>2.5) were rejected. The questionnaire (ESMPUSLQ) was trial tested using 50 NCE students and lecturers from the neighboring state, Benue state using test and retest technique. The instrument, yielded a reliability coefficient of 0.84. The reliability coefficient of 0.84 was adjudged reliable for the study. The administration of the questionnaire instrument was done by the researcher with the support of seven trained research assistants who were given orientation about the purpose of the study. Out of the 1560 copies of the questionnaires administered, only 1550 were returned. The data collected were analysed using the descriptive statistics of mean and standard deviations scores and t-test. The instrument was administered to students and lecturers at random and all completed questionnaires 1550 were collected, coded appropriately and subjected to analysis using the statistical passage for social sciences (SPSS Version 23).

Results

Table1: Descriptive Statistics Mean and Standard Deviation on Purpose of SMP Usage Among Students and Lecturers.

S/N	ITEMS	Mean	SD	Decision
1	SMP is an avenue for socializing with peers and colleagues in post covid-19 Era	2.76	1.05	Accepted
2	SMP can be used to study and learn new languages from friends/colleagues in post covid 19 Era	2.84	1.12	Accepted
3	SMP form good forum for group discussion among students and lecturers in post covid-19 Era	2.74	1.01	Accepted
4	SMP is an effective means of facilitating academic activities in post covid-19 Era	2.81	1.09	Accepted
5	SMP like WhatsApp, blog, twitter and the like are platform for effective interaction in post covid-19 Era	2.84	1.12	Accepted
6	SMP are effective means of communication in post covid-19 Era	2.76	1.05	Accepted
7	SMP is very effective information dissemination during this post covid-19 Era	2.89	1.17	Accepted
	Cluster Means	2.81	1.09	

In Table 1: All the items were accepted as the purpose of SMP among students and lecturers in post covid-19 Era. Items 1 to 7 all had mean scores above the cut

off mean of 2.5. The cluster mean of the items is 2.81 which is greater than the bench mean of 2.50. Hence they are all accepted

Table 2: Descriptive Statistics on Extent Of Utilization Of SMP Among Students and Lecturers.

S/N	ITEMS	Mean	SD	Decision
8	I check message on SMP daily especially on whatsapp,	3.63	1.37	Accepted



	facebook, twitter in post covid-19 Era using smart phone, tablet etc			
9	I use SMP to communicate almost every day with pears, students/colleagues in post covid-19 Era	3.58	1.35	Accepted
10	I use SMP as a routine that is an avoidable daily in sending or passing and receiving information in post covid-19 Era	3.47	1.47	Accepted
11	I interact daily with pears, students and colleagues on SMP daily on either face book, whatsApp, blog, twitter in post covid-19 Era	3.55	1.41	Accepted
12	I learn academic activities via SM P regularly in post covid-19 Era	3.56	1.41	Accepted
13	I connect with people, Events, seminal/workshops and news almost daily in post covid-19 Era	3.51	1.46	Accepted
14	I cannot do without SMP, seriously addicted to it especially whatsApp, face book, telegram, twitter in post covid-19 Era	3.44	1.49	Accepted
	Cluster Mean	3.53	1.44	Accepted

From the descriptive statistics in Table 2 for opinion of students and lecturers on the extent of utilization of SMP in teaching and learning of STEM Education in the post covid-19 Era, shows that items 8,9,10,11,12,13 and 14 all had mean scores greater than the cut-off men of 2.50. The items had a cluster mean of 3.53 and standard deviation of 1.41 which is also higher than the cut-off of 2.50. Hence all the items are accepted.

Table 3: Descriptive Statistics on Opinion of Students and Lecturers on SMP and Face-to-Face Strategy in the Post Covid-19 Era in Kogi State.

S/N	ITEMS	Mean	SD	Decision
15	I prefer face-to-face strategy of teaching/ learning to social media platform because data is involved in covid-19 Era.	3.45	1.06	Accepted
16	I like social media platform and face-to-face learning because I will not miss any lesson in post covid-19 Era	3.58	1.35	Accepted
17	I will like to explore teaching/ learning on social media platform in post covid-19 Era	3.25	1.22	Accepted
18	I delight learning using another method other than the face-to-face strategy in post covid-19 Era	3.35	1.17	Accepted
19	I prefer social media platform because I can post write up documents in post covid-19 Era	3.40	1.10	Accepted
20	I will like to explore teaching and learning using only face-to-face strategy in post covid-19 Era.	2.34	1.28	Not Accepted
21	Social media platform learning can replace face-to-face strategy in post covid-19 Era	2.36	1.25	Not Accepted
22	The social media platform will be more effective compared to face-to-face strategy in post covid-19 Era	2.28	1.25	Not Accepted
	Cluster Mean	2.97	1.20	Accepted

From the descriptive statistics in table 3 for opinion of students and lecturers on social media platform versus face – face strategy items number 15, 16, 17, 18, 19, all had mean scores greater than the cuff-off mean of

2.5, and hence they are accepted. However, items 20, 21, and 22 had mean scores less than the cut off mean, these items are therefore rejected.

Table 4: t-test statistics test on mean response of students and lecturers

Variation	N	Mean	SD	DF	Level of sig	t-cal	p-value	Remark
Lecturers	50	75.40	11.73	1548	0.05	0.54	0.58	Accepted as stated
Students	1500	74.59	9.44					

t - cal(0.54),p>0,05) df=1548, p=0.58>0.05

The result in table 4, reviewed that they is no significance difference in the response of the sampled students and lecturers on the use of both SMP and face to face as a blended teaching techniques in enhancing student academic achievement in STEM education in the post Covid-19 pandemic era in both public and private collages of education in Kogi state. Since the P-value, 0.58 is greater than 0.05 level of significance $t(1548)=0.54, P>0.05$). Therefore, the null hypothesis is retained. Implying that both student and lectures consensually accepted that blending SMP and face to face strategies enhances students' academic achievement in STEM education in the era of post Covid-19 pandemic in Kogi State.

Discussion

findings showed that students and lectures use the social media platforms for learning, socializing with peers, discussion, facilitating academic activities interaction, communications and effective information dissemination in the post covid 19 Era. This supports the findings Makadi,2014; Nwagwu & Alianihe 2015; Gado, 2017 that social media platforms are avenue for the students for socializing with peers, learning means of communication, collaborative tools for sharing information. The finding of the study is also in line with the finding of Timayi, Majiyebo and Ishaku (2021) that students and lectures use the social media platforms whatsapp for learning, communication, discussions, interactive and as aid to study.

From table 2. It was revealed that all items were accepted as the extent of utilization of SMP by students and lecturers in the post covid 19 Era in kogi state. This implies students and lecturers use SMP daily and as an addictive routine in the post covid 19 Era kogi state. This agree with the finding of Ewur (2014) which revealed that SMP is used daily to communicate, passing and receiving information, interacting, learn and carry out academic activities regularly, connect with people and events and highly addicted to SMP in the post covid 19 Era.

Table 3. Revealed that students and lecturers said they are willing to explore SMP and face to face in learning and teaching and that SMP cannot replace face to face

strategy of teaching; rather than both SMP and face to face strategy can be blended together.

The hypothesis on table 4. Confirmed blending of SMP and face to face strategies enhance students' academic achievement in the post covid-19 era in Kogi state, there is no significant difference in the mean responses of students and lecturers on teaching and learning of STEM education via social media and face to face strategies in the post covid-19 Era. This revealed the consensus opinion of the respondents on utilization of SMP and face to face strategies as a bended learning and teaching strategies the post covid-19 Era in Kogi State. This finding is in line with Ogundare (2017) that students and lecturers support the use of SMP and face to face strategy as a premise for blended learning. SMP cannot replace face to face strategy instead should be blended together. Blended approach (SMP& face to face) enables free expression in a non-restricted environment thus removing the low participation constraints characteristics to face to face, the learning of technical skills, sharing and searching information is enhanced among students and lecturers which are characteristics features of the blended approach where both SMP and face to face methods are utilized in teaching and learning.

Conclusion

Students and lecturers of the school of science kogi state college of education Anka like their counter parts elsewhere are exposed to the use and rudiments of social media platform s (whatsapp, facebook, twitter, blog e.t.c) this is evidenced by the exact of utilization and understanding skills. Student and lecturers have gained for themselves SMP skills which is useful in the exploration of blending of SMP and face to face method for improved pedagogical experience among students and lecturers in the college, in the post of covid 19 Era.

Recommendations

1. The management in the various institutions should encourage the use of SMP among



students and lecturers in the college for science teaching and learning

2. Seminars and workshop on how to blend SMP and face to face method for improving teaching & learning should be organized by the school management
3. School management should provide WIFI and ICT facilities to encourage students and lecturers to explore blended and teaching & learning approach (use of SMP & face to face method).

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