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Effect of Social Media on Students' Academic Achievement in Physics in Senior Secondary Schools in Calabar Municipality Local Government Area, Cross River State, Nigeria

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ABSTRACT

The study examined the effect of social media (such as Facebook, WhatsApp, YouTube, Twitter and Instagram) on students' academic achievement in physics in senior secondary schools in Calabar Municipality Local Government Area, Cross River State, Nigeria. Survey Research Design was used with a sample size of 200 students selected from different Senior Secondary Schools in Calabar Municipality. The data collected were presented and analyzed using the One-way Analysis of Variance (ANOVA) and student's independent t-test statistics at 0.05 level of significance. Based on the analysis, the study found that Facebook, Twitter, YouTube, and Instagram usage do not have significant effect on senior secondary school students' academic achievement in Physics. Meanwhile WhatsApp usage has moderately significant effect on senior secondary school students' academic achievement in Physics. It is observed that social media have negative and moderately positive significant influence on students' academic achievement in physics in senior secondary schools in Calabar Municipality Local Government Area, Cross River State, Nigeria. The study recommends that, there is need to incorporate

social media usage in academic course or lesson content in secondary schools to guide the students unto the positive usage of the social media.

Keywords: Social media, secondary school's students, academic achievements in Physics

1. INTRODUCTION

1. 1. Background of the Study

The internet, since its inception in the early 1960s by the U.S Department of defense has hit the ground running. A greater percentage of the world's activities and numerous facets of human endeavor have been (to a great extent) affected by the fast advancement of the internet technology and its programs. Internet, according to Wikipedia dictionary is a global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols. As mentioned in the above definition, one of the sectors of human endeavor greatly influenced by the internet is communication (Papoola, 2014; Hain,& Back, 2008). Several communication facilities have been developed on the internet to facilitate easy communication. Social media, the focus of this study constitutes one of those communication facilities. According to Aifan (2016), social media has emerged to be one of the most vital communication means as it exists to ease communication among people regardless of the expanse, making it open to people to easily share information, files, pictures and videos, create blogs and send messages and conduct real time conversations. By definition, according to Al-rahmi, & Othman (2013), social networks (media) is a social structure made up of individuals or organizations called "nodes", which are tied (connected) by one or more specific types of independency, such as friendship, kinship, common interest , financial exchange , dislike, sexual relationships or relationships of beliefs, knowledge or prestige. Social media sites include: Facebook, WhatsApp, 2go, Instagram, Blackberry messenger (BBM), Twitter, Google talk etc

Social media use cuts across almost all human age groups, social status, occupations and the likes including students of different institutional levels. The secondary school level which is the major focus in this research is not in any way exempted from amongst social media users. It is no news to see or hear secondary school students making calls, receiving messages and chatting with friends or associates in the class room when the class is ongoing. They spend late hours of the night on chatting through social media when you should have expected them to be reading their books or sleeping. The emergence of social media as a result of advancement in technology and expansion in internet software has raised eye brows among academics on its (social media) impact on studies (Ayodele, & Adebisi, 2013; Alwagait, *et al.*, 2014). Many researchers have argued as touching whether social media use has or has not any impact or influence on students' academic achievement. Students should step up and do what they are supposed to do by visiting the library and using exiting textbooks and materials provided instead of relying on social media; this is because the prime bad effect of social media is addiction.

This addiction could negatively affect other valued activities like concentrating on studies, taking active part in sports, real life communication and ignoring ground realities. There are hundreds of thousands of fake accounts on social networks who are boys pretending to be friends with girls and in most cases this leads to embarrassments and disappointments which finally result in depression. If there is awareness about the risk of social media in our community

it will not lead to anything bad but there is always lack of public awareness and as discussed above that the graph of internet users is getting higher and higher while we are still far behind in the field of education thus public awareness is very difficult in societies with lack of education (Farmer *et al.*, 2008; Domizi, 2013).

Social media did make the world a smaller place, now we have more information, more knowledge, and have better opportunities to use it. Social media improved our ability to absorb information, what would have seemed to be over whelming to someone 20 years ago is normal to us, we have an extreme ease in processing and we are evolving quickly. Facebook, WhatsApp, Instagram, YouTube and twitter plays both negative and positive roles in students' academic achievement, but studies such as (Karpinski, & Duberstein 2009). Kirschner and Karpinski (2010) discovered a drop in students' grades and academic performance. Lack of time for studies was observed to be a consequence of social media participation. However, a site-specific culture can both positively and negatively affect the building of social capital. Technology usage, like internet, is a vital factor that can influence students' performance positively or negatively. Onyeka *et al.*, (2013) proposed that the type of internet usage by students affect them. They are positively affected by the informative use while having drastic impact of recreational use on them. Internet is beneficial to both students and teachers if used as a tool for creating and sharing knowledge (Olutola, *et al.*, 2016).

Giving the analysis on the tracks of mass failure in the National Examination Council (NECO) results, Dayo Adesulun of Vanguard expressed "It is sad to note that for five consecutive years, candidates writing the National Examination Council (NECO) examination have recorded mass failures. Apparently, the scenario is worrisome to education stakeholders as nobody knows at whose door-steps to place the blames, students or NECO" (Vanguard news, April 5, 2012). The analysis reported that in 2002 at NECO's maiden edition, most candidates passed their registered subjects including physic which led to the public accusing the body of awarding cheap results to students. However, after 2007 NECO November/December where 65% had credit pass in Physics, the analysis said, performances of candidates deteriorated every year, down to 11.3% in 2011/2012 result, a situation which the reporter said called for concern among stakeholders. During NECO June/July 2011 examination, the analysis reported that less than 25% of the 1,160,561 candidates had passes at credit level in subjects including physic. This implies that more than 870,421 candidates failed Physics. In a similar vein, as reported by the WAEC Head of National office, Yaba, Mr. Charles Eguridu, the result of May/June 2014 as was announced on Monday, 11 August 2014, witnessed a mass failure in Physics (published on August 11, 2014; retrieved from <https://ynaija.com>). He reported that 529,425 candidates representing 31.28% obtained credits in physic and other four subjects. He noted that, comparing this result to the 2012/2013 May/June result, there was marginal decline in the performances of candidates. The report stated that in 2009, 25.99% obtained credits in physics compare to 23.5% in 2008 among the Nigerian candidates.

1. 2. Theoretical Framework

1. 2. 1. Theory of Social Constructivism

Constructivism is a combination of various speculations diffused in to one frame (Vygotsky, 1978). It is the digestion of both behaviouralist and psychological beliefs. The constructivist position keeps up that learning is a procedure of developing significance; it is the means by which individuals understand their experience. Social constructivism is a theory of

knowledge in sociology and communication theory that inspects the learning and understandings of the world that are produced mutually by people. These theories expect that understanding and importance are produced in a joint effort with other people. This theory was pioneered by Vygotsky (1978). He argues that the culture and context form understanding. Learning is not just an internal process, neither is it an inactive adjustment of behavior, rather it is a social construct mediated by language through social discourse (Prawat & Floden., 1994).

The most vital components in this theory are; the supposition that people legitimize their experience by making a model of the social world and the way it functions, and the confidence in language as the most basic framework through which people develop reality (Leeds-Hurwitz). Vygotsky (1978) states that psychological development happens first on a social level and after that it can happen inside the person.

Kim (2001) believes that social constructivism depends on particular assumptions about reality, knowledge, and learning; Reality: The first assumption of social constructivism is that reality does not exist ahead of time; rather it is developed through human action. Knowledge: Social constructivism sees knowledge as a human item that is socially and culturally developed. People can make meaning when they associate with each other and their environment. Learning: Social constructivism believes that learning is a social procedure. Learning does not happen just inside an individual, nor is it created by outside powers.

Social constructivism, influenced by Vygotsky's (1978) work, proposes that knowledge is first developed in a social setting and is then internalized and utilized by people. Collaborative elaboration, the process of sharing personal perspective, brings about learners constructing understanding together and this development is not conceivable alone inside people. Social constructivist researchers see learning as a dynamic procedure where learners should figure out how to find standards, ideas and realities for themselves, consequently they empower and advance the mystery and instinctive deduction in learners. As it were, social constructivist features that reality is not something that people can find since it does not pre-exist preceding their social development of it.

The tenets of social constructivism includes

- 1) A "meta-theoretical commitment" on the basis of three important tenets: as an epistemological claim,
- 2) knowledge is socially constructed; as an ontological claim, social reality is constructed;
- 3) finally, as a reflexive claim, knowledge and reality are mutually constitutive

The implication of the theory to this study is that Learners remain active throughout this process: they apply current understandings, note relevant elements in new learning experiences, judge the consistency of prior and emerging knowledge, and based on that judgment, they can modify knowledge. Constructivism has important implications for teaching.

1. 2. 2. Media Equation Theory by Byron Reeves and Clifford Nass, (1996)

The theory considered most appropriate for this study is the media equation theory. The theory proposes that media are equal to real life and that electronic media in particular are being given human attributes. In most cases, people talk to computer as if they were talking to human beings. More so, in most cases, they talk to their television set as if they were discussing with human beings. That is, people have personalized the media of mass communication to the extent that they now see them, just the way they see human beings. They further noted that what Reeves and Nass' equation suggests is that we respond to communication media as if they were

alive. This theory says that people now treat computers, television and the new media like real people and places. Going by the media equation theory, we tend to give human attributes to inanimate objects in our homes. Omotunde *et al.*, (2014) the practical implication of the media equation is that once we turn on a television or boot up on computer, we follow all the rules of interpersonal interaction that we have précised throughout life. Thus, the word interface is particularly apt when describing human media relations. This natural social response goes way beyond occasional words yelled at the television set or our frantic play for the computer to retrieve lost data. Reeves and Nass maintain that the media equation is so basic that it applies to everyone; it applies often and it is highly consequential.

The above assertion aptly captures how the audience members now tend to engage the media in a discussion as they do to human beings. The relevance of the media equation theory to this present study cannot be overemphasized. People, including students, treat media like human beings; hence they pay maximum attention to it and believe whatever they see in it as they would human beings. Students substitute their study and assignment time for social media to their own detriment.

The tenets of the theory are: Everyone responds socially and naturally to media, Media are more similar than different, the media equation is automatic, What seems true is more important than what is true, People respond to what is present, People like simplicity and Social & natural is easy Going with these theories along with the findings of this study, the researcher ascertained the impetus behind students' behaviors and attitudes towards social media, predicted the pitfalls.

1.3. Facebook Usage and Academic Achievemen

Facebook has attracted considerable attention among researchers. As a social networking site, it offers an online platform on which users create profiles, generate and share contents and information, and interact with other known and unknown contacts. Facebook also has experienced vast expansion in recent years, leading to its extensive use by people from all generations. Its 661.3 million users represent annual growth of 45.2%, Facebook has gained the greatest popularity among the young adolescents and students (Wang *et al.*, 2012; Pornsakulvanich, 2018). It has 2.2 billion monthly active users (© Statista, January 2018), 76% of young adults and teenagers (aged 12 to 24) use Facebook daily. From the previous few years, Facebook is becoming an essential part of our daily lives. It has the most active users all over the world so this is why Facebook is considered as the leader of social networking sites.

At first, Facebook was open only to students at Harvard, and subsequently at elite universities- Princeton, Stanford, and Yale. Later on, in 2006, it was made open to the public. Anyone over 13 years of age and with a valid E-mail could access Facebook (Voivonta, & Avraamidou, 2018). However, since its launch, this interface has extended across multiple college communities and then quickly incorporated a broader range of network connectivity of individuals and groups across the globe. Ajayi *et al.*, (2019) examined that majority of people use Facebook for friendship purpose. Most students use it just to make new friends or stay in touch with the existing friends. Just like all other social networks, Facebook has a great impact on student's academic performance. According to Kereke, & Lucky, (2014), they analyzed that with the advancement in technology, social networks become a part of persons daily lives especially Facebook has a huge impact on student's academic performance. Students have a tempting desire to connect with their friends due to easy 24 hours' access to each other's updates. Hence the use of Facebook has become a habit and necessity that affects the students'

academic performance. Facebook addiction is seen to affect performance both positively and negatively for e.g. it has been seen that Facebook has a negative effect on students grades that lead to poor academic success whereas Facebook also has positive effects such that Facebook can provide a platform for students to learn and share positive material with each other's which results in a better outcome for students. Today's generation Y college students are exposed to all types of technologies in many aspects of their lives (Junco *et al.*, 2011). On a daily basis, they use desktop computers, laptops, tablets and cell phones to actively engage in social networking activities such as text messaging, blogging, content sharing, online learning (Rouis, (2012). Thus, academic institutions and faculty are increasingly using social networking sites, such as Facebook and LinkedIn, to connect with current and potential students and to deliver instructional content. Sobaih, & Moustafa, M (2016) found that corroborating the work on the impact of social media on academic performance whereas participants who accessed Facebook one or more times during the study period had lower grade point averages. Furthermore, Junco *et al.*, (2011) added that sharing links and checking up with friends on Facebook more often predicted higher college grades; making status updates more often predicted lower grades, and that overall GPA dropped 12 points for every 93 min above the average of 106 min per day spent on Facebook.

Today, most students possess Facebook accounts. Oluwatoyin, (2011) noted the reason most of them perform badly in school might not be far-fetched. While many minds might be quick to blame the poor quality of teachers they might have to think even harder, if they have not heard of the Facebook frenzy and that those days, students are so engrossed in the social media that they are almost 24 hours online. Even in classrooms, it has been observed that some students are always busy ping-pong or face booking while teachers are teaching. Times that ought to be channeled towards learning, academic research and innovation have been crushed by the passion for meeting new friends online, and most times, busy discussing trivial issues. Hence most student's academics suffer set back as a result of distraction from the social media. It may be observed that the use of these sites also can affect student's use of English and grammar. This is because, while texting in any of this social media platform, there is need to use the short forms of writing for lack of space and for cost reduction, in order to pass their message across to their friends since they understand the code in the chat room too, they tend to forget and use the same short forms of writing in classrooms especially during exams. They use things like 4 in place "for", u in place of "you", d in place of "the" etc. All these could affect their grade or class assessment which in turn affects their achievement.

Mahmoud *et al.*, (2015) in a study on "impact of Facebook on undergraduate academic performance", averred that social media have negative impact on students. According to the result, the more students use Facebook, the more it affects their academic achievement. Similarly, Xie, *et al.*, (2008) notes that most of the younger students use social networking sites mainly for socializing activities, rather than for academic purpose. MehMood, & Taswir, (2013) further observed that most of the students do feel that social networking sites have more positive impact on their academic achievement. In another study conducted by Sobaih *et al.*, (2016), it was revealed that students use social network mainly for making friends and chatting. The result showed that only 26 percent of the students (respondents) indicated that they use social media for academic purpose. In another related study, Wang *et al.*, (2012) studied the effect of personality traits on the use of Facebook. They both found that users with less understanding of technology use Facebook less while those with high information and technology innovativeness like to spend more time on Facebook. Some other researchers have found

positive or almost null connection between grade earned by students and Facebook (Capua, 2012; Rouis, (2012). Steinfeld, Ellison and Lampe (2008), conducted a research to examine the connection between intensity of Facebook usage and students' academic achievement. The study has been conducted into two phases from April 2006 to April 2007. Intensity of Facebook usage was independent variables and questions concerning social capital and satisfaction with life were dependent variables. Average time of intensity of Facebook usage is not asked in survey questionnaire. In Midwestern University 800 students were sent an invitation survey form online and 92+92=184 students were selected for interviews in both years. Respondents have reported number of friends on Facebook increased as results showed 50% increased from 2006 to 2007.

Based on the findings a strong correlation was noticed between Facebook use and a students' academic achievement. Participants also reported spending more time per day on Facebook in 2007 as compared to previous year, roughly 21 minutes per day on average. Park, *et al.*, (2009) have studied the correlation between Facebook, its groups and the effect of on the student's academic performance. A primary contribution of this research "lies in the conceptualization of Facebook use and social capital". The measure of intensity of Facebook use developed by (Ellison *et al.*, 2007; Boyd & Ellison, 2007) has been used in this study. The relationship with Facebook use and social capital was not found large. Random sampling method technique has been used and in total = 2603 students with FB account has been selected out of 40,360. Participants mean age were 20.71% from an undergraduate university and a commuter college in the Texas. The survey has been in conducted between Novembers to December, 2007. Positive relationship has been found between Facebook use and increase in student's academic achievement. Instead of mention the average Facebook use time authors mentioned majority of the students 34.9% have spent their time between 30 minutes to 1 hour each day on Facebook activities. As compare to old user young users are more involved in Facebook use. Female students 63% have been reported to have more Facebook account than male students 37% of total sample. Significance of the study was strong correlation between Facebook use

and the social and political participation to increase students' academic achievement.

1. 4. Twitter Usage and Academic Achievement

Twitter is one of the most popular services in micro-blogging and it is the best way to discover what's new in your world (Gao, *et al.*, 2012; Graham, 2006). The objective of this social media platform is to share short messages constantly between friends and it is a veritable tool for students to fast-tract sharing of information. Several students use this platform to communicate happening around them and it keeps them abreast of the latest development in their communities. They use it to share photos, videos and other related academic materials that their classmates or people that like or share may be interested in. Although tweet messages can play an important role on the users, especially students in colleges and universities by receiving short news items and other posts relating to business, fashion, health etc. It is still being argued as to whether it has direct impact on students' academic performance as huge users are said to be business and political class. Maliki (2015) posited that twitter is widely used by teachers in the Arab World, particularly in the Kingdom of Saudi Arabia. The use of this social networking site by teachers in this region is fueled by the fact that it provides a platform for information, people, and knowledge. Teachers and students use Twitter to share content i.e. ideas and opinions and develop meaningful relationships with others in order to enhance their learning.

Twitter provides a portal through which users such as teachers and students can share their ideas and opinions and respond to other people's comments on a specific issue or subject area (Li & Bernhoff, 2008; Shhzad *et al.*, 2020). According to Maliki (2015), Twitter usage in the education of university students has involved creating platforms for discussion. In this case, teachers identify a topic of discussion based on the learning material or course. Once the topic is identified, they initiate a discussion on Twitter and provide a different way for students to be more involved in the learning process rather than simply reading the study matter in the classroom. In addition to discussing the subject area or topic initiated by the teacher, students explore more content relating to their academics and discuss it on Twitter. These platforms of discussion on Twitter provide an opportunity for teachers to engage the student more in their learning and cover course materials in a detailed and comprehensive manner (Aifan, 2016; Isnaini & Rakhmawati, 2016).

For students, the discussions via Twitter help in getting the most from the course material and getting a sense of the opinions and ideas of their colleagues regarding the course material and learning process. Alwagait, et al., (2014) states that Twitter has been found to have both positive and negative impacts on student achievement. The positive and negative impact of Twitter on student achievement in Saudi Universities is dependent on various factors including whether it was used excessively and whether it was used for educational purposes. In essence, when Twitter is not used excessively and primarily for academic purposes, it has positive impacts on enhancing student achievement. However, when this social media portal is used excessively including for non-academic purposes, it has negative impacts on student achievement within Saudi Arabia's university education setting. For instance, in a study that explored the link between social media usage and GPA score in most universities, social media technologies like Twitter were found to have both positive and negative effects on student achievement (Alwagait *et al.*, 2014). Aifan (2016) argues that social media usage in Saudi universities change the educational and learning culture. This change emerges from the fact that social media alters the learning practices of Saudi university students and the instructional strategies employed by teachers.

Aifan (2016) found that the positive impact of Twitter usage on university students in Saudi Arabia is supporting students' learning and improving teaching practices. Isnaini & Rakhmawati (2016) seemingly differ by arguing that the negative impact of social media usage on the learning environment is that it minimizes active participation of the learner. Shahzad, *et al.*, (2014) concurs by stating that social media usage has been found to have no relationship with the academic performance of university students. Junco, *et al.*, (2011) examined the impact of twitter on university students' engagement and GPA. Using an experimental design, students from a first year pre-health seminar were assigned to an experimental group (N=70) in which Twitter was used for a variety of academic activities and a control group (N=55). The analysis of engagement and GPA via an ANOVA test showed that students in the experimental group were significantly more engaged and had a higher GPA. Analysis of Twitter postings also reflected that high level of engagement on behalf of students and faculty. They concluded that social media has no negative impact on student academic achievement if they learned to allocate their time effectively. Kereke and Lucky (2014) conducted a study on the impact of social media on the Academic performance of university students in Nigeria. The causal-comparative research design was adopted. Findings showed that social media usage among students was not for academic purposes. The study also found out that the following were often used by students - Facebook 40 (40.81%), WhatsApp 20 (20.40%), and 2go/Skype 14 (14.28%) while Myspace,

Twitter, Badoo, Blogs/web scholars, Google+ /social book marking were not often used by undergraduates in the four universities for the study. Mahmoud *et al.*, (2015) examined the relationship between student's grades and social media networking at the University of Jordan. The subjects chosen for study were undergraduate students of the University. The study indicated that most of the social media network users were females with ages between 20-23 years. Almost 39% of the students were spending 3 hours per day on Twitter, while 40% of the students spent 10 hours on social media every week. The results obtained did not indicate any effect of social media on college student grades or academic performance.

1. 5. Instagram Usage and Academic Achievement

Instagram is another popular social networking site to be considered. Instagram is a social networking photo-sharing mobile application that allows users to take pictures, apply filters to them, and share them on the platform itself, as well as other platforms like Facebook and Twitter (Davi *et al.*, 2007). Instagram is the fastest growing social networking site due to the rapid growth in its popularity among teenagers and young. Instagram is the most popular social media platform compared to other platforms such as Facebook, Twitter, and Snapchat especially among young people (Kircaburun, *et al.*, 2018). One of the main influences of Instagram is the ability to build communities of learners instantly, mediated by hashtags and followers (Rauch *et al.*, 2014). This feature is a significant advantage that allows a student's work to be discovered globally and, by creating a sense of having an audience, it motivates the learning of subject content. This is particularly so if students need to develop a video or animation to share on Instagram, as reported for online video sharing by pre-service teachers. Other Instagram functionalities that align well with learning include the ability for students to showcase their learning and receive feedback from their lecturers and other users worldwide. Students can develop digital media skills if the Instagram activity design includes training in digital media principles to produce compelling images, animations, and videos (Rauch *et al.*, 2014). Another way to incorporate Instagram for large classrooms is as a communication tool. The teacher can send reminder posts about critical concepts, due dates, and other important information to students (Reyna, 2021).

Students can also learn to communicate effectively in the digital space, especially to summarize their ideas to fit the limited space allowed for replies to IG posts. Using IG as a formative assessment can be implemented by posting images after the class in conjunction with a question in the descriptions below them (Reyna, 2021). This approach will prompt students to discuss or provide their opinion. By doing this, the educator can gather whether students have understood the concept or require further instruction. Students will have the opportunity to reflect on their learning and interact with their peers. The teacher can also more organically invite students to showcase concepts, questions, and reflections to the whole classroom. Instagram, a visually or photo based social networking site got points for self-expression and self-identity, though it was associated with high levels of anxiety, depression, bullying and FOMO, or the "fear of missing out" (MacMillan, 2017).

It may be more detrimental to the mental well-being of its users compared to text-based sites like WhatsApp and Telegram due to body dissatisfaction, eating disorder, social comparison, social acceptance and internalization of the ideal amongst its users which may explain the detrimental impact of Instagram on the user (Faelens *et al.*, 2021). The tendency to share only the best moments, a pressure to look perfect and an addictive product can send youths spiraling toward eating disorders, an unhealthy sense of their own bodies and depression.

However, the challenge with the platform was that some few students found it hard to keep up with what was being posted. Instead, they only look at the account when they are posting material for class. To resolve this problem, certain grades were rewarded to students who posted on the platform. It was discovered that when students find out something is part of their grade, they tend to think that as long as they participate on that thing, they will satisfy the requirements. This motivated students to actively participate and it changed their learning experience for better and as well improved their academic performance. This platform was found to be very efficient in improving students' academic achievement and it is adopted in this study (Whiting, & Williams, 2013; Zhang, 2016; Zhang, *et al.*, 2020).

1. 6. WhatsApp Usage and Academic Achievement

The use of social media can generate contexts that include collaborative and cooperative based on horizontality along with more traditional teaching practices. Ultimately, the significance of educational networks will be linked to educational project in which every experience is framed (Rouis, 2012). According to Zhang *et al.*, (2020) mentioned that to encourage the process of education, it's important to begin to develop from informal (family, leisure...) educational environments, the school must also integrate the new culture: digital literacy, information source productivity tool for work, teaching materials, cognitive instrument.

Obviously school students should approach today's culture, not the culture of yesterday. Abdulla (2017) posited that, Humanity has significantly altered the ways to communicate, to entertain, to work, to negotiate, to govern and to socialize, based on the dissemination and use of ICT globally. It is also universally recognized that ICT is responsible for increases in productivity, previously unimaginable, in the most varied sectors of business activity, and prominently in knowledge economies and innovation.

The two major reasons for the extensive use of ICT in educational practices are the paradigm shift in favor of constructivism which put more emphasis in interactivity in learning and emergence of ICT with the features of the provision to express oneself freely and synchronous interactivity (Oluwatoyin, 2011). Halic, *et al* (2010) opined that the purpose of social networking is not only imparting knowledge to students but also used to share scientific findings and to prevent new knowledge from remaining static, that is, working for the democratization of knowledge and its dissemination.

The versatility of educational networks can combine in one space study different ways of teaching and learning. Some of the most prominent technological innovations are smartphones, laptops and using the internet. The mobile application (WhatsApp) is one of the modern communication technologies. This process, which started by commonly used web-based social networks (Facebook, Twitter, etc.) in particular, began to be approached in different dimensions after the introduction of the messaging applications rooted in mobile phones and are specifically designed for mobile phones (WhatsApp, BBM, Line, etc.).

Though they differ structurally to some extent (Boyd & Ellison, 2007; Papoola, 2014), it hasn't taken much time for the social networks, which have become a part of users' daily lives, to be used in education. Though there are a lot of instant messaging applications that can operate on mobile devices, it is seen that WhatsApp application is one of the most favored mobile based applications. WhatsApp has grown in popularity due to its benefits such as being able to send real-time messages to an individual or groups of friends simultaneously

1. 7. YouTube Usage and Academic Achievement

YouTube typically submit daily-themed videos, such as their adventures, trips, cosmetic tutorials, and product reviews. They also speak in a variety of languages because they are from numerous nations. In this situation, youngsters are frequently watching the vlogs and imitating the pronunciation of the word, whether it is correct or incorrect, as well as whether or not they grasp the meaning. However, in order to teach speaking, the instructor still employs time-consuming methods such as reading a book followed by exercises and assessments. Furthermore, language acquisition is not about completing tasks, but rather about how people interact in that language. As a result, integrating technology in English instruction is more beneficial to train students in becoming used to English, and one example is YouTube. Kgalemelo, (2018) shown that integrating video blogging in learning activities helps students enhance their speaking skills. The output of a YouTube can be used to measure occurrence and speech fluency, allowing students' development to be illuminated and worthy of evaluating their language competency. Anil (2016) also suggests three advantages of adopting YouTube for English learning. First, the instructor has several opportunities to urge pupils to speak in the classroom, but due to time constraints, the majority of them fail the trial. One thing to keep in mind while using vlogs in the teaching-learning process is that it increases students' speaking time.

This implementation encourages students to talk more in order to increase their fluency, vocabulary, grammatical characteristics, and anxiety. Some of the past research will be described here, as will the use of YouTube in speaking performance. The first researcher demonstrated that integrating video blogging in learning activities helps students enhance their speaking skills (Thang, *et al.*, 2014). The subjects of this study were students in two universities who were ESL and EFL students at the same levels as students in Indonesia. The kind of difficulties in learning to talk was noted, and the improvement of the students' speaking performance with the use of video blogging was demonstrated. The decline in the academic achievement among senior secondary school students in Nigeria, specifically, Calabar Municipal Local Government, is crystal-clear to anyone who has followed the trend of events in this level of learning over the past few years.

This degradation is evident in many ways, including students poor grammatical construction, poor averages in their terminal examinations, failure in external examinations such as the West African Examination Council (WAEC), National Examination Council (NECO) and of course entrance examinations such as the Unified Tertiary Matriculation Examination (UTME). The struggles for academic success experienced by many students newly admitted into the university, especially in their first year of study, is highly traceable to their secondary school foundation. The success of any student in tertiary institution is directly a function of his/her success in the secondary school in the same subject.

Nowadays, the use of internet connected mobile phones by a good number of secondary school students is a common sight. They use such to find friends on Facebook or chat with their friends without even considering how much time they spend on it. In the process, a great deal of time that should be allotted to reading of textbooks and self-study is traded without recourse to the impact this may have on their academic achievement. In fact, social media usage by secondary school students has reached such a crescendo that it is a concern to all stakeholders in education for its potential risks. Social media usage presently, appear to create lax attitude on writing among students who use social media networks as they abbreviate and spell using computer checks. This may invariably affect students' formal way of writing and general

attitude to learning which key determinants of their academic achievement are. With the current rate of social media usage among students, unabated, it is evident that the neglect of textbooks and learned journals, if not addressed will cause more of our library textbooks and journals to be totally forgotten and more authors will prefer to remain digital. Many factors have been identified to be responsible for this high rate of educational decay among senior secondary school students. One of these factors that have caught the attention of the public as regards students' poor academic achievement among the secondary schools is the advent of social media. The government and stakeholders, including management has proffered several measures to curb the use of social media, these include the ban on the use of mobile phone in school, expulsion of students etc., but this has not yield tangible result as their mass failure of secondary school students in mathematics as a result constant focus on social media. As mentioned earlier, this research investigates the place of social media use in the academic achievement of senior secondary school students in Physic in Calabar Municipal Local Government area of Cross River State, Nigeria.

The main purpose of the study would be to examine the influence of social media usage on students' academic performance in Physics in senior secondary schools in Calabar Metropolis, Cross River State, Nigeria. Specifically, the study seeks to examine the followings; the effect of Facebook, Twitter, Instagram, WhatsApp and YouTube on senior secondary school students academic achievement in Physics. In order to carry out this study, the following research questions were raised and answered:

What is the effect of Facebook on senior secondary school students' academic achievement in Physic?, Does twitter usage affect senior secondary school students' academic achievement in Physic?, What is the effect of Instagram on senior secondary school students' academic achievement in Physic?, Does WhatsApp usage affect senior secondary school students' academic achievement in Physic?, and what extent does YouTube affect senior secondary school students' academic achievement in Physic?

The Statement of hypotheses were the followings; Facebook usage does not have significant effect on senior secondary school students' academic achievement in physics , Twitter usage does not have significant effect on senior secondary school students' academic achievement in physics, Instagram usage does not have significant effect on senior secondary school students' academic achievement in Physics, WhatsApp usage does not have significant effect on senior secondary school students' academic achievement in Physics, YouTube does not have significant effect on senior secondary school students' academic achievement in physics

2. RESEARCH METHODS

2. 1. Research Design

This study employed the survey research design. Survey research design according to Kerlinger (1986), Isangedighi, *et al.*, (2004) is that which is directed towards determining the nature of a situation as it exists at the time of investigation. This design deals with condition or relationship that exists, practices that prevail and attitudes of subjects. The design was used because it allows the researcher to find out what already exists and draw inferences and generalizations on large population that could be too expensive to study as a whole, thus this makes it economical. This study tend to study quite a large population through a representative

sample using questionnaire in order to discover the relative incidence, distribution and interrelationship between variables.

2. 2. Area of Study

The area of study is Calabar Municipality which is a local government Area of Cross River State, Nigeria. Its headquarters is at Marian Road in the city of Calabar. It has an area of 142 km² and a population of 179.392 at the 2006 census. The population of the study covered 13 public senior secondary schools 2 (SSS 2) in Calabar Municipality. Cross River State.

2. 3. The Sample

Samples of two hundred (200) respondents were used for this study. It comprises of one hundred and five (105) male and ninety five (95) female from five selected schools in Calabar Municipality. The respondents were selected by use of hat and draw method. Yes and No tags were written on pieces of paper carefully folded and put in a basket. The member from each department was then asked to pick a paper ball from the basket without replacement from the sample size.

2. 4. Instrument for Data Collection

The instrument used for the data collection was structured questionnaire which has four (4) sections: A, B, C D and E. Section. Section A deals with the personal information of the respondents such as name of school, class, sex, age. While section B consisted of 5 items that elicited response based on the items on the research work, especially the research variables Facebook, Twitter, Instagram, WhatsApp and YouTube; and 5 items that measures academic achievement of students in Physics. The options range from the respondents were expected to complete the questionnaire by placing a tick (√) at the appropriate column as a brief introduction on how to respond to the item was given.

The reliability of the instruments used in this research was established using the responses of the students from the selected schools in Calabar Metropolis. In order to determine the internal consistency of the questionnaire, the data collected was analyzed using the test-re-test reliability method to determine the internal consistency of the instrument.

2. 5. Procedure for Data Analysis

Data collected through the questionnaire was used for statistical analysis for each of the hypothesis, the independent and dependent variables identified and the appropriate statistical tool for testing each of hypothesis stated. All the hypotheses were tested significantly using 0.05 level of significance. The following hypotheses and their appropriate statistical analysis are presented as shown below.

2. 5. 1. Hypothesis One

Null hypothesis (Ho): No, Facebook usage does not has significant effect on senior secondary school students' academic achievement in Physics.

Alternative hypothesis (Ha): Yes, Facebook usage does has significant effect on seniorsecondary school students' academic achievement in Physics.

Independent variable: Facebook usage.

Dependent variable: students' academic achievement in Physics.
Statistical analysis: Independent t-test.

2. 5. 2. Hypothesis Two

Null hypothesis (Ho): No, Twitter usage does not has significant effect on senior secondary school students' academic achievement in Physics. Alternative hypothesis (Ha): Yes, Twitter usage does has significant effect on senior secondary school students' academic achievement in Physics. Independent variable: Twitter usage Dependent variable: students' academic achievement in Physics. Statistical analysis: Independent t-test.

2. 5. 3. Hypothesis Three

Null hypothesis (Ho): No, Instagram usage does not has significant effect on senior secondary school students' academic achievement in Physics.

Alternative hypothesis (Ha): Yes, Instagram usage does has significant effect on senior secondary school students' academic achievement in Physics. Independent variable: Instagram usage. Dependent variable: students' academic achievement in Physics Statistical analysis: Independent t-test.

2. 5. 4. Hypothesis Four

Null hypothesis (Ho): No, WhatsApp usage does not has significant effect on senior secondary school students' academic achievement in Physics. Alternative hypothesis (Ha): Yes, WhatsApp usage does has significant effect on senior secondary school students' academic achievement in Physics. Independent variable: WhatsApp usage. Dependent variable: students' academic achievement in Physics Statistical analysis: Independent t-test.

2. 5. 5. Hypothesis Five

Null hypothesis (Ho): No, YouTube usage does not has significant effect on senior secondary school students' academic achievement in Physics. Alternative hypothesis (Ha): Yes, YouTube usage does has significant effect on senior secondary school students' academic achievement in Physics.

Independent variable: YouTube. Dependent variable: students' academic achievement in Physics. Statistical analysis: One-Way Analysis of Variance (ANOVA).

3. RESULT AND DISCUSSION

3. 1. General Description of Data

The data for this study was collected from two hundred senior secondary school students made up of male and females across different age groupings as presented in Table 1. The hypotheses in the above 2.5 section were tested by classifying the data collected into three groups using the formula $X \pm 1SD$. This produced three groups with the usage of Video Blogging's in – High, Moderate and Low. The achievement in physics of these students in physics were compared using the One-way Analysis of Variance (ANOVA).

Table 1. Distribution of Sample by Gender and Age

Age	Gender		Total (%)
	Male (%)	Female (%)	
Below 14 years	16(8.0)	34(17)	50(25)
14-15 years	8(4)	13(6.5)	21(10.5)
Above 15 years	21(10.5)	108(54)	129(64.5)
Total	45(22.5)	155(77.5)	200(100)

The information in Table 1 shows that out of the two hundred (200) students used in the study, 45 were boys making 22.5% of the total sample and girls were 155 making a total of 77.5% of the sample.

Out of this number, fifty (50) were below the age of 14 years in which male were 16 and females were 34 making 8% and 17 percent of the sample respectively. Those between the ages of 14-15 years were 21 made up of 8 and 13 male and female, contributing to 4% and 6.5% of the sample, respectively. Out of the sample, one hundred and twenty nine were above the age of 15 years. Out of this number, 21 were male while 108 were females contributing to 10.5% and 54.5% of the sample respectively.

The mean and standard deviation were also computed for the dependent and independent variable as presented in Table 2.

Table 2. Summary Data on the Research Variables (n = 200)

Variable	Number of items	X	SD
Achievement in Physics	5	11.29	3.37
Use of Facebook	5	15.94	4.40
Use of Twitter	5	8.82	4.74
Use of Instagram	5	15.29	5.16
Use of WhatsApp	5	14.48	5.78
Use of YouTube	5	11.29	3.37

The information in Table 2 was rearranged to test the hypotheses of this study at 0.05 level of significance.

3. 2. Hypotheses by Hypotheses Testing

The hypotheses stated in above section 2.5.1, have been tested and compared amongst the high Facebook users and low users using the independent t-test analysis as shown in Table 3

Table 3. Independent t-test analysis of the effect of Facebook usage on senior secondary school student’s academic achievement in physics

Facebook Usage	N	X	SD	t	P-value
Low	111	11.25	3.40	-0.176	0.86
High	89	11.34	3.35		
Total	200	11.29	3.37		

The information in Table 3 shows that there is no significant influence of Facebook usage on senior secondary school students’ academic achievement in physics ($t = -0.176; P = 0.86$). Hence, the null hypothesis that Facebook usage does not have significant influence on senior secondary school students’ academic achievement in physics is upheld at 0.05 level of significance. The hypotheses stated in above section 2.5.2 have been tested and compared amongst the high Twitter users and low users using the independent t-test analysis as shown in Table 4.

Table 4. Independent T-test analysis of the effect of Twitter usage on student’s academic achievement in physics

Twitter Usage	N	X	SD	t	P-value
High	76	11.42	2.96	0.429	0.668
Low	124	11.21	3.61		
Total	200	11.29	3.37		

Table 4 shows that Twitter usage does not has significant effect on senior secondary school students’ academic achievement in physics ($t = 0.429; P = 0.668$). Hence the null hypothesis that Twitter usage does not has significant effect on senior secondary school students’ academic achievement in physics is upheld at the 0.05 level of significance. The hypotheses stated in above section 2.5.3 have been tested and compared amongst the high Instagram users and low users using the independent t-test analysis as shown in Table 5.

Table 5. Independent t-test analysis of the effect of Instagram usage on senior secondary school student’s academic achievement in physics.

Instagram Usage	N	X	SD	t	P-value
High	101	11.05	3.45	-1.069	0.287
Low	95	11.56	3.28		
Total	200	11.29	3.37		

Table 5 shows that that Instagram usage does not has significant effect on senior secondary school students’ academic achievement in physics ($t = -1.069$; $P = 0.287$). Hence, the null hypothesis that Instagram usage does not has significant effect on Senior Secondary School students’ academic achievement in physics is upheld at the 0.05 level of significance. The hypotheses stated in above section 2.5.4 have been tested and compared amongst the high WhatsApp users and low users using the independent t-test analysis as shown in Table 6.

Table 6. Independent t-test analysis of the effect of WhatsApp usage on senior secondary school student’s academic achievement in physics.

WhatsApp Usage	N	X	SD	t	P-value
High	118	11.21	3.56	-0.392	0.049
Low	82	11.40	3.10		
Total	200	11.29	3.37		

The P-value in Table 6, shown that senior secondary school students with high and low blogs usage do significantly differ in their academic achievement in physics ($t = -0.392$; $P = 0.049$). Hence, the null hypothesis that WhatsApp usage does not has significant effect on Senior Secondary School students’ academic achievement in physics is rejected at the 0.05 level of significance. The hypotheses stated in above section 2.5.5 have been tested and compared amongst the high and low YouTube users using the independent t-test analysis as shown in Table 7.

Not significant at the 0.05 level of significance. The information in Table 7 and Table 8 show that students with high, moderate and low level of usage of YouTube’s usage do not significantly differ in their academic achievement in physics ($F = 0.575$; $P = 0.564$). Hence,

the null hypothesis that YouTube usage does not have significant effect on senior secondary school students' academic achievement in physics is upheld at the 0.05 level of significance. The testing of hypothesis one showed that the null hypothesis was upheld which implies that Facebook usage does not have significant effect on senior secondary school student's academic achievement in physics.

Table 7. Summary data and one-way analysis of variance (ANOVA) of the effect of the use of YouTube on senior secondary school students' academic achievement in physics.

YouTube Usage	N	X	SD
Low	21	11.71	2.26
Moderate	42	11.64	3.13
High	137	11.12	3.59
Total	200	11.29	3.37

Table 8. One way analysis of variance

Source of variance	SS	df	MS	F	P- value
Between groups	13.12	2	65.56	0.574	0.564
Within groups	2252.06	197	11.432		
Total	2262.18	199	76.992		

This is in agreement with the findings of Ahsanul Haq, & Chand, (2012) postulated that majority of students use Facebook for friendship purpose. Most students use it just to make new friends or stay in touch with the existing friends. Just like all other social networks, Facebook has a great impact on student's academic achievement. David, (2014), also support this finding when they found out that advancement in technology, social networks become a part of persons daily lives especially Facebook has a huge impact on student's academic achievement. Students have a tempting desire to connect with their friends due to easy 24 hours' access to each other's updates. Hence the use of Facebook has become a habit and necessity that affects the students' academic achievement. Isnaini, & Rakhmawati, (2016) supported this finding when he opined that excess using social media among students could arouse their sexual behavior which can further affect their academic achievement. Furthermore, he added that right usage may bring some good results and improve students' academic achievement.

The null hypothesis was upheld for the analysis of the second hypothesis. This means that Twitter usage does not have significant influence on Senior Secondary School students' academic achievement in physics. This is in line with the finding of Junco, *et al.*, (2011) when

they found that Twitter postings also reflected that low and high level of engagement on behalf of students and faculty. They concluded that social media does not have significant effect on student academic performance if they learned to allocate their time effectively. In essence, when Twitter is not used excessively and primarily for academic purposes, it has positive impacts on enhancing student academic performance. Kereke and Lucky (2014) also support this finding when he opined that students' academic achievement is not directly linked to the amount of time spent on social media. They argued that Twitter usage in the education of secondary school students has involved creating platforms for discussion. In this case, students identify a topic for discussion based on the learning material or course. Once the topic is identified, they initiate a discussion on Twitter and provide a different way for students to be more involved in the learning process rather than simply reading the study matter in the classroom which helps improve their academic achievement.

In hypothesis three, the null hypothesis was also upheld which implies that Instagram usage does not also have significant effect on senior secondary school students' academic achievement in physics. This finding is in line with the findings of Rauch *et al.*, (2014) when they found that most of the students who were computer literate and merely access relevant academic materials through the Cyber Café. Most of the students disclosed that the Instagram usage improves their examination preparation. E-journals and e-books were among the resources often used. However, power outage, slow internet speed, lack of computer terminals, too many information overload and insufficient computer were some of the problems impeding effective internet access or usage which has help to improve their academic achievement.

In testing of hypothesis four, it was revealed that the null hypothesis was rejected. This implies that WhatsApp usage does have significant effect on senior secondary school students' academic achievement in physics. This finding is in an agreement with the findings of Oluwatoyin (2013) which postulated that majority of students use WhatsApp to access current academic journal through group interactions. Most students use it just to make new friends or stay in touch with the existing friends. Just like all other social networks, WhatsApp has a great impact on student's academic achievement. Awidi, *et al.*, (2019) supported these findings when they opined that education in Nigeria must move away from tradition and toward technology in order to reap the benefits of higher education learning rather than the current emphasis on academic achievement. The success of WhatsApp is determined by students' attitudes about them. In a research on the educational usage of web 2.0 technologies among students to improve their academic achievement.

Also, YouTube usage does not have significant effect on senior secondary school students' academic achievement in physics. This is in line with the findings of Anil, (2016) when he found a negative relationship between YouTube and students' academic achievement and supported by Puffy, (2008).

4. CONCLUSIONS

The study made use of the descriptive survey design and was appropriate in this study in those variables for the study namely social media usage and student academic achievement had already occurred. The result obtained in the analysis revealed that Social media do not have positively significant effect on senior secondary school students' academic achievement in Physics, except WhatsApp usage which has significant effect on senior secondary school

students' academic achievement in Physics. Social media has negative and moderate positive effect on students' academic achievement in physics in senior secondary schools in Calabar Municipal Local Government Area, Cross River State, Nigeria. A review of related literature was carried out to determine what relevant scholars and researchers' have already documented on the variables covering the phenomena under study.

Recommendations

The following recommendations are made and considered necessary:

- Students should be cautions on the constant use of social media, that they should be educated on the proper use of Facebook for academic purposes only.
- There is need to incorporate social media usage in academic course or lesson content in secondary schools to guide the students unto the positive usage of the social media.
- Parents and teachers should curtail excessive usage of social media by students through effective monitoring regulation.
- Public secondary schools should encourage their teachers in the use of e-learning facilities for teaching and learning of physics through regular training and institutional policy e-learning to promote global competitiveness.
- Counseling program should be organized for male and female secondary school students to put them on the right track on the positive usage of social media in enhancing their academic achievement.
- There is need to design appropriate behavioral change communication materials that will educate adolescents of various age groups and parents about the potential benefits and draw backs of using social media.

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