Original Article

CLASSROOM TECHNOLOGICAL INTERVENTIONS AS CORRELATES OF STUDENTS' ACADEMIC PERFORMANCE IN UNITY SECONDARY SCHOOLS IN SOUTHEAST NIGERIA

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Abstract

This study investigated the relationship between classroom technological interventions as correlates of students' academic performance in unity secondary schools in South East Nigeria. The study adopted a correlation survey research design. The sample of the study comprised 280 students drawn from Federal Government Colleges in South East, Nigeria. The sample size was determined using the Taro Yamane sampling formula while the sampling technique adopted was a multi-staged sampling procedure. The instruments for data collection were a 36-item researcher developed questionnaire titled: Classroom Technological Interventions Questionnaire (CTIQ) and a 10-item Students' Academic Performance Questionnaire (SAPQ). The instruments were validated by three experts while Cronbach Alpha statistic was used to determine the internal consistency of the two instruments which yielded reliability indices of 0.71 and 0.80 for CTIQ and SAPQ respectively. Ten well-briefed research assistants helped in the administration and collection of the instrument. Out of the 280 copies of the questionnaires administered, 267 copies each representing 95 percent return rate were collected and used for data analysis. Pearson product moment correlation was used to answer the seven research questions raised for the study while linear regression analysis was used to test the null hypotheses that guided the study at 0.05 level of significance. The findings showed among others that Technological interventions significantly to a very high positive extent relate to students' academic performance in unity secondary schools in South East, Nigeria. It was also found that WhatsApp application significantly to a very high positive extent relate to students' academic performance in unity secondary schools in South East. Based on the findings, it was recommended among others that Government as well as other stakeholders such as the Alumni and Parent Teachers' Association should provide the necessary technological intervention tools and infrastructures that could facilitate teachers' effective use of technological intervention tools in teaching.

Keyword: education, vocational skills, development, socio-economic wellbeing, rural women.

Introduction

Education is an essential aspect of human capacity building that requires utmost attention and concern. This makes education a useful tool for societal transformation and economic sustainability, depicting that every developed economy in terms of human and

material variables lay emphases on quality practicability education. Anho (2019) defined education as imparting and acquiring of knowledge through teaching and learning especially at the school or similar institution. Education therefore is defined as the activities that takes place in either formal or informal setting that involves transfer of new knowledge, enhance creativity and promotes good reasoning which is capable of developing the participants and the society for better living. Robert (2014) defined education as the process that involves the creation of sound mind in a sound body. This indicates that education helps an individual to be reasonable and focused in dealing with the societal challenges within their locality. Education thus involves teaching, training and learning activities that bring about new skills, concepts and ideas that may facilitate effective participation and contribution in the society. Secondary school education thus remain a channel through which classroom technological interventions could be used to foster sustainable academic performance amongst students.

Unity secondary schools also known as federal government colleges were established by the federal government of Nigeria in 1966. They were known as inter regional secondary school and was later changed to federal government colleges or unity secondary schools in the old East, North and Western region of Nigeria. The schools cut across the 36 states of the nation with the sole aim of ensuring national unity and integration in the country. More so, each state has two federal government colleges, one is gender school (Federal Government Girls College) and mixed school (Federal Government College).

The colleges were established on the premise of providing secondary school education of a high standard to students from all states of the federation. Ezeuwa and Ani (2015) noted that the colleges are collectively called 'Unity Schools" and adopted the motto 'pro-unitate'. Federal government colleges serve as a model uniting the entire federation with the purpose of enhancing better understanding, patriotism, national unity, and attitude modeling among students and teachers for national cohesion and knowledge building. Ogbonnaya in Ezeuwa and Ani (2015) averred that federal government colleges have the philosophies and objectives of creating the opportunities for Nigerian students to receive quality education irrespective of state, tribe and culture; working and playing together in their formative years for the purpose of forming lasting friendship with other students from across the country; as well as enabling all students learn to be tolerant and appreciate differences in the cultural background of fellow students. In secondary schools, unity schools to be precise, classroom space in an essential environment that supports technological interventions for teaching and learning.

Classroom is a well-designed and structured space with conducive resources for carrying out teaching and learning exercise. Anebi in Modebelu and Duvie (2013) noted that classroom is the only place designed and coordinated for teaching and learning experiences to take place. This comes in form of various instructional efforts of the teacher through single teaching, team teaching, and programmed learning amongst others. For the classroom to facilitate effective instructional outcome that may propel students' academic performance, factors such as classroom management, classroom organization, classroom arrangement, effective classroom communication, and classroom control become needful. Olowoye in Ezimoha and Modebelu (2017) defined classroom management as the method or technique employed to ensure that learners utilize available resources which gear towards accomplishing educational goals in the school system as well as enhance learning. Classroom activities in today's world is technology driven.

The present-day global environment is marked by the divergent technological intervention classroom software that supports quality existence and co-existence of human activities. Afriyie in Shahinaz (2018) defined technology as comprising the basic knowledge of sub-system, technical support system (software) and the capital-embodied technology (hardware). Volti in Olugbemi (2019) defined technology as a system created by humans that uses knowledge and organization to produce objects and techniques for attainment of specific goals. In different view, technology is seen as human intelligence in form of software and electronic chips used for fast and convenient productivity in human society. Classroom technological intervention thus remain an emerging issue in the field of education.

Classroom technological interventions has actually set a global pace in effectively conducting human activities without much stress especially in the field of education. Technological intervention in classroom instructional delivery remain an innovative means of teaching and learning at different stages of education. Davison and Lazaros (2015) contended that pedagogical functionality in using technological intervention tools involves content delivery, task collaboration and planning, search for information and assessment and access to virtual environment which holds on discussion board. Imperatively, these interventions are seen as technological tools that could be effectively used in harmonizing effective teaching through adequate and effective planning strategies.

Classroom technological intervention is seen as that technological software that support effective teaching and learning in the classroom. Ogedi (2021) defined classroom technological intervention as technological tools and gadgets that are adopted, made available and used by teachers for their instructional activities and programmes. This technological software include, X which was formerly known as twitter, instagram, facebook, WhatsApp, goggle classroom, goggle team, zoom and goggle cloud. These classroom technological interventions in the educational system provides useful information for users which support advanced delivery of instruction with the help technological pedagogies.

Technological interventions seem to have high-cost effectiveness in providing these applications for instructional activities. It also improves quality of teaching and learning when adopted. Iyo and Daagu (2017) opined that to improve quality of the teaching-learning process in secondary schools, there is need for a sharp shift in the pedagogical approaches in use. They recommend that attention be paid to move from the traditional lecture and discussion method of teaching to methods that ensure seeing, touching, hearing, manipulating, storing and managing large volume of information with appropriate gadgets for effective teaching and learning. Kenkwo, Ogedi, and Ekeoma (2017) maintained that communication technology really has contributed to skill development learning, creativity and innovation, hi-thinking among students and development in technological environment to access information that is educative to the user. WhatsApp application thus remains one of the classrooms technological interventions that is discussed in this study.

WhatsApp Messenger is a cross-platform instant messaging client for smart phones, personal computers and tablets. The application relies on the internet to send images, texts, documents, audio and video messages to other users that have the application installed on their device. According to Parmy and Olsen (2014), WhatsApp is a proprietary cross- platform instant messaging client for smart phones that operates under a subscription business model. It uses the online networking system to transmit messages, images, videos, user location to others users. According to Katres (2015) WhatsApp is a social messaging service acquired by Facebook

for $19bn in 2014. It is now the world's fastest-growing communication application. An individual can chat with friends and family overseas through WhatsApp without having to incur global SMS charges. Kashmira (2015) stated that WhatsApp is the new SMS in business because of its speed, opening ratio, frequency of use, and quality of communication. WhatsApp is the preferred channel by consumers because of its simplicity and easier way to send messages rather than calling or sending emails. The application is aimed at small business owners. It is designed to make it easier for them to communicate with customers and manage their orders. Ekeledo (2021) contended that WhatsApp business users can create a business profile and add details like the company's websites, location and contact information to it. Zoom meeting affords teachers and learners the opportunity to freely express themselves during instructional exercise.

Zoom application thus emerges amongst the 21st century social media platforms that supports effective teaching of physics and chemistry in secondary schools. Abbott (2020) opined that zoom platform is a classroom technology that keeps people together notwithstanding that in a larger class that not all student may benefit. Zoom application or cloud meeting is a conference or classroom video platform or software designed by zoom video communication which supports effective online transaction among different people in different locations. The free plan for zoom utilization allows up to 100 concurrent participants, with a minimum of 40minutes time restriction. Lorenz, Griffith and Issac (2020) contend that zoom is the primary social platform for millions of people which its most users are high school and college students which has made most institutions to move to online learning. Users also have the option to upgrade their zoom communication link by subscribing to a paid plan. The highest plan supports up to 1,000 concurrent participants for meeting online which has the capacity to last for about 30hours. Zoom application was developed by Eric Yuan on 10 September, 2012 with supporting operating system such as windows, macOS, Linux, Android, iOS and chrome iOS. The software is configured in 11 languages which supports videoconferencing, VolP and instant messaging. Zoom therefore is an active classroom participatory platform that supports quality instructional delivery as it permits the learner to contribute their ideas during instructional activities as well as to enhance their technological competence in the online classroom. All these classroom technological interventions help to enhance students' academic performance.

Academic performance amongst students remains a long-aged issue that has raised concern among educational providers and its clients. This has led a high state of interest on the side of the educational institutions and society at large on the best alternative approach to enhance students' academic performance. The level to which a student performs in their academics has raised a lot of issues as to ascertain the measures through which a student performs well in their educational career. Scott (2013) defined academic performance as how well students were able to accomplish his or her task. Ipem in Ukandu (2020) defined academic performance as performance of students in various subjects offered in the school over a specified period of time. Education system as a production industry measures its productivity level using students' academic performance. The education industry is viewed to have achieved a high level of production when students' performance is at a high and could be seen as unproductive when its students' performance is at decline point. Ajuo in Fasasi (2014) concerted that students' academic performance in both internal and external examinations have been used to determine teacher's effectiveness in job delivery. Academic performance of students therefore looks at improved value, attitude, content and

preparedness to measure with the required standard set by the school at local and international levels of education.

Statement of the Problem

Administrative effectiveness of principals deals with the ability of the secondary school principals to perform outstandingly in their assigned tasks. It is characterized by their ability to coordinate and harmonize both human, financial and material resources to achieve educational goals.

Quality in education is achieved when students' academic performance leads to the educational goals. Technological tools are incorporated into the education system especially in classroom instructional activities to enhance students' academic performance which culminates to optimal realization of educational goals. Some of these technological devices provides virtual learning platforms like chatrooms, collaborative discussion, content sharing and audio conferencing which facilitates learning and effective communication between teacher and learners, provide excellent platform to create and manage assignment, send and receive feedback remotely. Classroom technology as a preparatory and exploratory device that supports effective instructional delivery by teachers permits the learner to contribute ideas through deliberate interactions between the teachers and learners. The quality of these learners is very important in the transformation because the quality of what is produced determine the quality of societal sustainability. Hence, the use of classroom technological interventions to achieving student's academic performance is to achieve educational goals.

In recent times however, it was observed that most secondary school students in South East, Nigeria could not achieve the goals of education due to poor academic performance. This poor academic performance is commonly found among physics and chemistry students as a result of their perception on the difficultness of these subjects' areas. Instructional technologies which have been acknowledged as one of the classroom mechanisms that improve quality teaching and learning and so enhance students' academic performance are not efficiently integrated and used for instructional purpose. Again, the present-day educational system globally is marked by integration classroom technological software that supports teaching and learning as a result of the societal innovations. These technological tools became obvious in the educational circle during the outbreak of the global pandemic (Covid 19). This results to the use of X, zoom, google classroom, WhatsApp, Facebook, Instagram and Blogs amongst other technological apps.

More so, it seems that there is decrease in students' engagement and motivation which would have paved way for greater academic performance. This problem could be attributed to teachers' incompetence in handling classroom technological instructional resources as well as poor students' engagement in instructional processes. The classroom activities have decayed to the extent that student's academic performance is very poor and this has failed to achieve the purpose of the school, individual and society. The classroom should be likened to a factory where raw materials are transformed into output of higher quality. In the classroom, learners are transformed into a graduates with high skills, knowledge, abilities and aptitude.

The question that needs to be addressed or answered is, could students' poor academic performance be attributed to poor practical simulation of technological interventions in classroom for instructional delivery, that would have likely yielded a positive result that would enhance students' academic performance. It is against this backdrop that this study seeks to examine classroom technological intervention as correlate of students' academic

performance in unity secondary schools in South East, Nigeria.

Purpose of the study

The purpose of this study is to ascertain the relationship between classroom technological interventions and students' academic performance in unity secondary schools in South East, Nigeria. Specifically, the study sought to;

1. examine the extent the to which utilization of zoom application relate to students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria.
2. determine the extent to which utilization of WhatsApp relate to students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria.
3. determine the extent to which classroom technological intervention jointly relate with students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria.

Research Questions

The following research questions guided the study. They are:

1. To what extent does utilization of zoom application relate to students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria?
2. To what extent does utilization of WhatsApp relate to students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria?
3. To what extent does classroom technological intervention jointly relate with students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria?

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance.

$H0_1$: there is no significant relationship between utilization of zoom application and students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria.

$H0_2$: there is no significant relationship between utilization of WhatsApp and students' academic performance in physics and chemistry in unity secondary schools in South East, Nigeria.

$H0_3$: there is no significant joint relationship between classroom technological interventions and students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria.

Theoretical framework

The study is rooted on the theory of Connectionism by George Siemen (2005)

Connectivism theory by George Siemen (2005): The theory states that competence is gained from connections and the capacity to know more, more critical than what is currently known. The assessment of network that consist of learning resources, using technological software and gadgets for instructional delivery plays an essential role in achieving effective teaching and learning outcome in the university education. These technologies help in the sourcing, download and retrieval of relevant academic information. The learning environment therefore is created and used by the learners to access, process, filter, recommend and apply information with the assistance of technologies, peers, and instructors within the learning network. Learning may expand as a result of power of the network to create and personalize knowledge, connections and artifacts of those within it. The theory thus lays emphases on creating pathways to knowledge when needed in order to ensure that learning effectively takes place. The theory also postulates that learning and knowledge can also take place outside the human being thus paved way for database, devices, tools and technological gadgets which a learner can manipulate. The prime element of connectivism theory is to create new connections for learning irrespective of formal education system; to expand and build network

connections. This shows that the theory is interested in simulating and allowing learners to create new learning concepts using emergent technological connections, increase of expatriate skills, social capital and curate value for resources. Notwithstanding, the theory in its weakness lack substantively the instructors' role and extensive critics placed on the learner who in actual learning setting requires motivation to engage in self- directed learning.

The relevance of this theory to this study entails that, if students are allowed and encourage to exercise their internet and technological skills, concepts and innovation in learning activities such may enhance competence and effective instructional outcome. The theory also is relevant to this study by supporting that appropriate mobile application technologies be employed by the instructor (lecturer) to facilitate new knowledge and creativity in delivering instructional content as well as adopt diverse methodological strategies to impact positively on the learner. This will in effect enhance the competence and capacity level of all educational participants in using technology for carrying out their academic activities effectively.

Methodology

Correlational design was used for this study. The study was carried out in South East, Nigeria. The South East Nigeria has five states namely Abia, Anambra, Ebonyi, Enugu and Imo. The population of this study is 934 Senior Secondary Two Students offering physics and chemistry from the 10 Federal Government Colleges in South East, Nigeria of which 5 were Federal Government Colleges and 5 Federal Government Girls Colleges. The sample of this study was 280 students from the 10 Federal Government colleges in south east, Nigeria. The figure 280 was determined using Taro Yamen Mathematical estimation model. This sampling fraction was obtained by dividing the population by the sample size thus S. F = 280/934. The teachers were drawn using simple random sampling. For more details on the sample selection per school. Classroom Technological Intervention Questionnaire (CTIQ) and Students Academic Performance Questionnaire (SAPQ) was used for data collection. CTIQ and SAPQ were validated by two experts from the Department of Educational Management and one expert from measurement and evaluation, all from Michael Okpara University of Agriculture, Umudike Nigeria. To determine the internal consistency of the instruments, 30 copies of the questionnaires was administered to 30 students in Federal Science and Technical College, Ohanso Abia State which is not part of the study area, but shares same similarity in their academic programmes. The coefficient of the relationship was obtained using Cronbach alpha method to determine the internal consistency of the cluster items for reliability index. The two instruments yielded an index of .71 for CTIQ and .80 for SAPQ respectively, which was considered reliable.

The researcher used teachers to respond to the instruments with regards to classroom technological intervention Questionnaire and students' academic performance Questionnaire because the students are not to access or evaluate themselves when it comes to their performance. More so, the researcher used the teachers to solicit for information in order to avoid biasness since the students cannot access themselves. 115 respondents (Teachers) were used for the study which comprised of 58 physic teachers and 57 chemistry teachers from the 10 unity secondary schools.

A total of 115 copies of the questionnaire were distributed to physics and chemistry teachers in unity secondary schools in South East, Nigeria. Ninety-four (94) copies of the questionnaire were completed and returned from the respondents which gave 81.7% return rate while 21 copies of the questionnaire experience mortality resulting 18.3% unreturned rate

of the questionnaire from the respondents. The figure 94 therefore served the basis for the study analysis.

The data were analyzed using Pearson Product Moment Correlation Coefficient statistic to answer the research questions 1 to 6 while research question 7 was answered using Scheffer's test. t-test was used to test hypothesis 1 to 6 while simple linear regression analysis was used to test the hypothesis 7 at 0.05 level of significance. The strength of the relationship was established using Creswell (2008) correlation coefficient scale thus; +/-0.70 to 1.00 as strong/high extent relationship, +/-0.40 to 0.69 as moderate/medium extent relationship and +/-0.00 to 0.39 no correlation/ weak/low extent relationship

Results

Research Question one

To what extent does utilization of zoom application relate to students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria?

Table 1: Correlation Matrix between Zoom Application and students' academic performance in unity secondary schools in Southeast, Nigeria

		ZMA	SAP
ZMA	Pearson	1	.870
	Sig (2-tailed)		.000
	N	267	267
	R^2	(0.757)	
		75.7%	
SAP	Pearson	.870	1
	Sig. (2-tailed)	.000	
	N	267	267

ZMA= Zoom Application, SAP= Students' Academic Performance

The results on table 1 reveal a correlation coefficient (r) of .870 which is positive and within the coefficient limit of ±0.80 and above indicating strong, positive and a very high extent relationship. This however implies that utilization of Zoom Application has strong, positive and a very high extent relationship with the students' academic performance in unity secondary schools in Southeast. The coefficient of determination (R^2) of 0.757 indicates that approximately 76% of the variance observed in the students' academic performance in unity secondary schools in Southeast was attributed to Zoom Application.

Hypothesis one

There is no significant relationship between utilization of zoom application and students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria.

Table 2: Linear Regression Analysis of the Relationship between Zoom Application and students' academic performance in unity secondary schools in Southeast, Nigeria

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	3827.355	1	3827.355	107.849	.000[b]
	Residual	9439.698	266	35.488		
	Total	13267.053	267			

Df= degree of freedom, F = F-calculated, Correlation is significant at the 0.05 level (2-tailed)

The results on the table 2 showed a P- value of 0.000 which is less than the alpha value of 0.05. Since the P-value is less than 0.05 alpha value, it implies that the null hypothesis stated was rejected. Therefore, there is a significant relationship between utilization of Zoom application and students' academic performance in unity secondary schools in Southeast, Nigeria.

Research Question two

To what extent does utilization of WhatsApp relate to students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria?

Table 3: Correlation Matrix between WhatsApp Application and students' academic performance in unity secondary schools in Southeast, Nigeria

		WAA	SAP
WAA	Pearson	1	.874
	Sig (2-tailed)		.000
	N	267	267
	R^2	(0.764)	
		76.4%	
SAP	Pearson	.874	1
	Sig. (2-tailed)	.000	
	N	267	267

WAA= WhatsApp Application, SAP= Students' Academic Performance

The results on table 3 indicate a correlation coefficient (r) of .874 which is positive and within the coefficient limit of ±0.80 and above indicating strong, positive and a very high extent relationship. This however implies that utilization of WhatsApp Application has strong, positive and a very high extent relationship with the students' academic performance in unity secondary schools in Southeast Nigeria. The coefficient of determination (R^2) of 0.764 indicates that 76.4% of the variance observed in the students' academic performance in unity secondary schools in Southeast was attributed to WhatsApp Application.

Hypothesis two

There is no significant relationship between utilization of WhatsApp and students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria.

Table 4: Linear Regression Analysis of the Relationship between WhatsApp Application and students' academic performance in unity secondary schools in Southeast, Nigeria

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	3779.997	1	3779.997	100.953	.000[b]
Residual	9959.880	266	37.443		
Total	13739.877	267			

Df= degree of freedom, F = F-calculated, Correlation is significant at the 0.05 level (2-tailed)

The data on the table 4 showed a P- value of 0.000 which is less than the alpha value of 0.05. Since the P-value is less than 0.05 alpha value, it indicates that the null hypothesis stated was rejected. Therefore, there is a significant relationship between utilization of WhatsApp application and students' academic performance in unity secondary schools in Southeast, Nigeria.

Research Question Three

To what extent does classroom technological intervention jointly relate with students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria?

Table 5: Correlation Matrix between Classroom technological Interventions and students' academic performance in unity secondary schools in South East, Nigeria

		GSA	MTA	GCA	ISA	ZMA	WAA	Joint	SAP
	Pearson Correlation					1			.870
ZMA	Sig. (2-tailed)								.000
	N	267							267
WAA	Pearson Correlation						1		.874
	Sig. (2-tailed)								.000
	N	267							267
Joint	Pearson Correlation							1	.894
	Sig. (2-tailed)								.003
	N	267							267

ZMA= Zoom Application, WAA= WhatsApp Application, SAP= Students' Academic Performance *. Correlation is significant at the 0.05 level (2-tailed)

It was equally found from the table a coefficient of .870 which is positive and within the coefficient limit of ±0.80 and above indicating strong, positive and a very high extent relationship. This however implies that utilization of Zoom Application has strong, positive and a very high extent relationship with the students' academic performance in unity secondary schools in Southeast. The table 2 reveal a correlation coefficient (r) of.874 which is positive and within the coefficient limit of ±0.80 and above indicating strong, positive and a very high extent relationship. This however implies that utilization of WhatsApp Application has strong, positive and a very high extent relationship with the students' academic performance in unity secondary schools in South East. Finally, reveal a correlation coefficient (r) of .894 which is positive and within the coefficient limit of range of 0.80 and above indicating very high extent relationship. This indicates that Classroom technological interventions to a very high positive extent, predict students' academic performance in unity secondary schools in Southeast.

To determine the relative contributions of Classroom technological interventions (Zoom Application, WhatsApp Application) on students' academic performance in unity secondary schools in Southeast, a Scheffe test was carried out and the predictive indices of Classroom technological interventions are presented as shown in Table 6 below:

Table 6: Scheffe Test on Relative Contributions of Classroom technological Interventions on students' academic performance in unity secondary schools in Southeast, Nigeria

			ZMA	WAA	Joint	SAP
	Pearson Correlation		1			.870(49.474)
ZMA	Sig. (2-tailed)					.000
	N	267				267
WAA	Pearson Correlation			1		.874(50.526)
	Sig. (2-tailed)					.000
	N	267				267
Joint	Pearson Correlation				1	.894(71.109)
	Sig. (2-tailed)					.003
	N	267				267

Table 6 shows that the predictive indices of Classroom technological interventions of Zoom Application and WhatsApp Application are .870, and .874 respectively. These however represent 49.474 and 50.526 percentages of relative contributions of Zoom Application and WhatsApp Application respectively on students' academic performance in unity secondary schools in South East. In other words, WhatsApp Application had the highest percentage contribution of 50.52646%, followed by Zoom Application with percentage contribution of 40.474% relative contribution.

Hypothesis Three

There is no significant joint relationship between classroom technological interventions and students academic performance in physics and chemistry in unity secondary schools in South East, Nigeria.

Table 7: Multiple Regression Analysis of Classroom technological Intervention and students' academic performance in unity secondary schools in Southeast, Nigeria

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4907.873	1	4907.873	130.751	.003[b]
Residual	9884.671	266	37.536		
Total	14.792.544	267			

Df= degree of freedom, F = F-calculated, Correlation is significant at the 0.05 level (2-tailed)

The data on the table 7 above revealed a joint relationship between Classroom technological interventions and students' academic performance in unity secondary schools in Southeast, Nigeria. This is shown by a P- value of 0.000 which is less than the alpha value of 0.05. Since the P-value is less than 0.05 alpha value, it indicates that the null hypothesis stated was rejected. Therefore, there is a significant relationship between Classroom technological interventions and students' academic performance in unity secondary schools in Southeast, Nigeria.

Findings of the Study

1. Utilization of Zoom application significantly to a positive very high extent relate to students' academic performance in unity secondary schools in South East, Nigeria.
2. Utilization of WhatsApp application significantly to a positive very high extent relate to students' academic performance in unity secondary schools in South East, Nigeria.
3. Technological interventions significantly to a positive very high extent relate to students' academic performance in unity secondary schools in South East, Nigeria.

Discussion of the Findings

The findings of the study were discussed according to the research questions and the major findings of the study.

Utilization of Zoom application and students' academic performance in unity secondary schools in Southeast, Nigeria

The results on table 1 and 2 revealed that utilization of Zoom application significantly to a positive very high extent relate to students' academic performance in unity secondary schools in Southeast, Nigeria. In other words, the teachers' use of Zoom application in teaching yielded a very high positive relationship with students' academic performance. Specifically, the results indicated among others that its use enhances students' interaction in the class, enhances their use of video clips for practical learning, and gives room for students to re-watch video clips which cumulatively improve students' learning to a very high extent. The results agreed with Ogedi (2021) who opined that the use of Zoom application encourages students' interaction as well as their academic performance. This improved performance could be because the

application involves the use of videos. The results also agreed with results from the earlier study by Owusu-Acheaw and Agatha (2015) who conducted a study on the use of social media and its application on academic performance and found among others that the use of social media such as Zoom application had significant impact on the students' academic performance. The results aligned with Inije, Utoware and Kren-Ikidi (2013) who in a similar study found that Zoom application is one of the most preferred social media platforms in instructional deliveries since it is very interactive and easy to use by both the students and teachers in academic activities.

The results in Table 3 and 3 showed that utilization of WhatsApp application significantly to a positive very high extent relate to students' academic performance in unity secondary schools in Southeast, Nigeria. The results showed among others that the respondents agreed that teachers' use of WhatsApp application enhances students' academic performance since it facilitates both the students and students' interaction as well as students' and teachers interactions during teaching and learning. They equally agreed that the use of the application enhances learning to a very great extent since it helps the students in discovering new concepts as well encourages learning by doing. These in other words implied that teachers use of WhatsApp application in instructional deliveries have a significant positive relationship on students' academic performance. The results supported Akinlosotu (2016) who in a similar study found among others that the use of WhatsApp application in the classroom instructions enhanced undergraduates' academic performance in Economics. The results from Akinlosotu (2016) further indicated that the use of the application enhances the students' performance because they use it more regularly to attend to their cognitive, affective and socio-integrative education needs. The result also aligned with Aderele, Odewumi and Adelokun (2017) who found from a similar study that video instructional packages had significant effect on students' academic achievement. The result is expect to be high because of the video and audio component of the WhatsApp application which can enhance students' engagement in academic activities and learning.

Finally, it was found from the study in Table 5 and 6 that Technological interventions significantly to a positive very high extent relate to students' academic performance in unity secondary schools in Southeast, Nigeria. This implies that teachers' use of Technological interventions such Zoom and WhatsApp applications in instructional delivery yielded a very high positive relationship with students' academic performance in unity secondary schools. These results no doubt are expected since those applications make learning more interactive by making the learner a more active participant in the instructional activities. The results agreed with Aydin (2017) who maintained that the integration of technologies into the classroom teaching and learning has been acknowledged as one of the classroom mechanisms that improves quality teaching and learning. The results also agreed with Ahmadi (2018) who stated that availing the pre-service and in-service teachers the opportunity to use appropriate technologies in the classroom instructions does not only enhance their capacity, competence, skills, values and knowledge of those technologies for quality instructional outcome but specifically in enhancing students' performance. The use of Technological interventions no doubt have solved the enormous challenges posed by the regular use of the conventional teaching method which make the learner passive and non-explorative.

Recommendations

1. Principals of secondary schools that lack qualified teachers in some subject areas should access the services of qualified teachers from other schools

that have through technological interventions such as zoom.

2. School Counsellors as well as class Form masters should have regular orientations for students on how to uses and explore some technological interventions such as WhatsApp application for academic purposes instead of, for leisure entertainment.

3. Government as well as other stakeholders such as the Alumni and Parent Teachers' Association should provide the necessary technological intervention tools and infrastructures that could facilitate teachers' effective use of technological intervention tools in teaching.

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