IMPLEMENTATION OF BLENDED LEARNING DURING COVID-19 LOCKDOWN IN NIGERIA: A CASE STUDY OF FEDERAL SCHOOL OF SURVEYING, OYO. (10958)

[1]Olufemi Felix IYIOLA, [2]Saheed Salawudeen OLANIYI,

[3]Michael OKEGBOLA and [4]Ajiboye Oyesiji OYEYODE, Nigeria

[1,2,3,4]Department of Surveying and Geoinformatics

Federal School of Surveying, Oyo, Oyo State, Nigeria.

SUMMARY

Federal School of Surveying, Oyo, Nigeria implemented blended learning for the final year National Diploma (ND) students during the COVID-19 lockdown in the country. The implementation involved 70% lecture delivery online and 30% lecture delivery face-to-face with the use of WhatsApp and Google Classroom. Online classes were held on WhatsApp for students while assignments and additional lecture materials were distributed via Google Classroom. Online tests were conducted to assess the students, revision classes were held face-to-face when the school re-opened. Field practicals and semester examinations were later conducted to conclude the semester. Class records showed that about 80% to 90% registered students participated in the online lectures. Success rate in the online tests conducted showed over 90% for one course, 80% to 89% for five courses, 72% to 76% for three courses and 62.4% for one course (Table 1). Challenges faced during online lecture delivery included slow internet speed, few students living in remote area without access to internet facilities and some who could not afford the cost of internet data subscription could not join the classes regularly. The study recommended that the Federal and state government should install appropriate facilities that will support online lecture delivery in the government-owned institutions, there should be supports for both staff and students of these institutions so that they can key into the programme properly for smooth online lecture delivery and government should ensure stable power supply and good internet speed in the higher institutions for online learning. The study also shows that blended learning is more cost-effective, flexible and accessible than traditional teaching.

Keywords: Blended Learning, Online Learning, COVID-19, Lockdown

1.0 INTRODUCTION

Corona Virus and Disease popularly referred to as COVID-19 had altered the global processes through its influence on every aspect of human existence. COVID-19 infection had gone viral and causing nearly incurable infection on the global populace with insignificant breakthrough in the field of medicine to provide a vaccine that could combat the infectious virus and diseases. Due to this effect, the leadership in every strata of the globe had found the stay-at-home/ lockdown order as the only viable measure to control and minimize the spread of the COVID-19 virus. It's on this premise that many sector of the global economy had started the exploration and exploitation of work from home so that the global processes will not be put on absolute lockdown.

The first confirmed case of COVID-19 was reported in Nigeria on 27th February 2020, the infected person is a 44-year old Italian citizen who arrived at the Murtala Muhammed International Airport, Lagos on 24th February 2020. The number of confirmed cases rose to 84,811 with 1,264 deaths, 71,357 discharged cases and 12,190 active cases (https://covid19.ncdc.gov.ng/, accessed on 29th December 2020 04:58pm) within fifty two (52) weeks the first case was reported. The spread of COVID-19 as wildfire has covered thirty-six (36) states of the federation including the Federal Capital Territory (FCT). The spread in Nigeria with an estimated population of over 206 million has been a major concern to the Federal and State governments. Nigeria Centre for Disease Control (NCDC) released guidelines to reduce the spread of COVID-19 which include social distancing; frequent hand washing, avoiding crowded places and physical contact, use of face masks, etc. International borders, both government and private academic institutions across the globe were closed down in order to reduce the spread of the virus (Iyiola, Ajani and Oyelakin, 2020).

It was based on this background that many academic institutions around the globe had switched from physical interactive class into online lecture for the continuation of their academic activities. Due to this global trend, Federal School of Surveying (FSS), Oyo, Nigeria also explored this technological innovative trend of Online Lecture using the affordable and efficient way to continue with the academic activities of the students during the lockdown period. Based on these facts, opinion polls were conducted among the staff and students; a proposal was developed to actualize the adoption of the online lecture and submitted to the school management for approval. The stakeholders in actualization of this innovative online teaching are; the school management, the Head of Department, Information and Management System (IMS) Coordinator, Course Lecturers, Class Adviser and the Students.

2.0 IMPACT OF COVID-19 ON EDUCATION

The lockdowns in response to COVID-19 have interrupted conventional schooling with nationwide school closures. Students from priviledged backgrounds with the supports of their parents were able to learn using alternative learning opportunities while disadvantaged students remained shut out since their schools were shut down. Educational institutions made concerted efforts to maintain learning continuity during lockdown and students relied on their own resources to learn remotely through the internet, television, radio and other online resources. Teachers also adopted the new pedagogical concepts and modes of lecture delivery for which

they may not have been trained while poor students who may not have access to digital learning resources may learn on their own and are at the risk of falling behind (Andreas, 2020).
School closures affected face-to-face learning and examinations as well as safety and legal status of international students in their host country. Governments at various levels encouraged academic institutions to adopt a variety of resources to support learning during lockdown, the resources included instructional packages (textbooks, worksheets and printouts), radio and television education with online instructional resources. Blended or hybrid learning does not use any single delivery medium rather incorporates a wide range of learning opportunities like online and face-to-face (Ruchi and Sunita, 2015).

3.0 BLENDED LEARNING

Blended learning is a learning programme where more than one delivery mode is being used with the objective of optimizing the learning outcome and cost of programme delivery. It is an integrated combination of traditional face-to-face learning with web-based online approaches. Blended learning is a way of meeting the challenges of tailoring learning and development to the needs of individuals by integrating the innovative and technological advances offered by online learning with the interaction and participation offered in the best of traditional learning. It is a learning environment that either combines teaching methods, delivery methods, media formats or a mixture of all these methods (Ruchi and Sunita, 2015).
Characteristics of blended learning include:

i. Learner have enough time and opportunities to interact socially
ii. Learners are guided to attend mindfully to the learning process
iii. It supports all the benefits of e-learning including cost reductions, time efficiency and location convenience for the learner as well as the essential one-on-one personal understanding and motivation that face-to-face instructions presents

4.0 BRIEF HISTORY OF THE SCHOOL

What is today known as Federal School of Surveying, at the present site – Oyo, Oyo State, Nigeria, started off as Survey School on 1st July, 1908 at Onikan, Lagos. It was then designed to provide a 3-year survey course for recruits who had completed full secondary education. It thus became the pioneer of survey training in the whole of Africa. The School was moved to Ibadan in 1926 and finally relocated to Oyo in 1929. The 3-year course structure continued until the School was merged with Yaba Higher College in 1936 when a four-year course structure was introduced. The 4-year arrangement lasted up to 1948 when the survey training in Nigeria was temporarily taken over by the then University College Ibadan (now University of Ibadan), when she took off in 1948. The University College inherited Yaba Higher College and subsequently Survey School at Oyo. The proposed degree programme was short lived because it was scraped by the colonial administration. The School re-opened in 1952 as a regional school of the then Western Region Government of Nigeria while the Federal Government established another survey school at Okene, Nigeria. The two Schools were merged to become one and on the present site at Oyo in 1965. The mandate of the School was to provide articulated programmes of training in Surveying for technicians, technologists and professionals (Bouloucos and Kufoniyi, 2000).
In order to achieve the above objective, the School mounted programmes that were later streamlined with those of National Board for Technical Education (NBTE) to have National

Diploma (ND), Higher National Diploma (HND) and Professional Diploma (PD or Post-HND) programmes in Surveying and Geoinformatics

4.1 Academic Departments in the School

a. Department of Surveying and Geoinformatics
   i. National Diploma (ND) in Surveying and Geoinformatics (4 Semesters)
   ii. Higher National Diploma (HND) in Surveying and Geoinformatics (4 Semesters)
   iii. Professional Diploma (PD or Post-HND) in Surveying and Geoinformatics (3 Semesters)

b. *Department of Cartography and GIS
   i. National Diploma (ND) in Cartography and GIS (4 Semesters)

c. *Department of Photogrammetry and Remote Sensing
   i. National Diploma (ND) in Photogrammetry and Remote Sensing (4 Semesters)

d. *Department of Computer Science
   i. National Diploma (ND) in Computer Science (4 Semesters)

*Newly established and accredited departments which will commence students' enrolment in 2020/2021 academic session

5.0 NEED FOR ONLINE LECTURE DELIVERY

The school had concluded face-to-face lecture delivery with all classes before COVID-19 lockdown in Nigeria except final year students of the National Diploma (ND) programme in Surveying and Geoinformatics Department who just returned from the Compulsory 16-week Students' Industrial Works and Experience Scheme (SIWES) programme. These students could not commence classroom lectures while other students could not write semester examination as a result of school closure due to COVID-19. During the pandemic, virtual learning became the only available option for lecturers in the school to teach the students who just returned from SIWES programme.

6.0 SETTING UP OF A TECHNICAL COMMITTEE

For the purpose of writing a good and viable proposal for online lecture delivery for the final year students in National Diploma (ND) class, a technical committee was set up to deliberate on the issue and the committee comprised:

i.	Head of Department of Surveying and Geoinformatics	-	Chairman
ii.	Head of Department of General Studies	-	member

iii.	Head of Department of Cartography and GIS	-	member
iv.	Acting Dean, Students' Affairs	-	member
v.	Coordinator, SIWES/Practical Unit	-	member
vi.	Coordinator, IMS Unit	-	member
vii.	Coordinator, Entrepreneurship and Skills Acquisition Centre	-	member
viii.	A representative from Library department	-	member
ix.	Examination officer	-	secretary

The committee was mandated to work on the modalities to be adopted to set up, deliver and manage the online lecture delivery. The committee deliberated on the following:

6.1 Benefits of Online Lecture Delivery to FSS, Oyo

The COVID-19 pandemic period had made many organizations including academic institutions both in Nigeria and oversea to explore the capability of the online platforms for meetings, seminars and conferences, e.g. FIG 2020 working week, Federal Executive Council meeting of the Federal Republic of Nigeria, Surveyors Council of Nigeria (SURCON) meeting with the pupil surveyors, etc. The benefits of online lectures are numerous and inexhaustible, some of the benefits that Federal School of Surveying, Oyo will derive from it are as follows:

i. **Low Cost of delivery:** The cost of online lecture delivery is at a reduced rate when compared with the cost of face-to-face lecture delivery. The physical presence of the staff and students are not necessarily required and travelling cost is not compulsory.

ii. **Increase in Staff efficiency:** Through training, staff can develop many lecture packages via online delivery without the physical presence of the staff thereby the staff can engage in his other official assignment as well as staff development training program.

iii. **Seamless Development and Delivery of Customized Short Term Courses:** Development and delivery of short term courses will be efficient without the participant leaving the place of work, hence, they will only need to visit the school during writing examination, thesis defense as well as convocation ceremony.

iv. **Reduced pressure on the School Infrastructures:** Since no physical presence is required from the students/ lecturers/ participants, the issue of over-stretching of infrastructure will be reduced such as inadequate classroom, number of hours for putting on the school generator for power, etc.

v. **Development of the state-of-the-art ICT infrastructure:** Up-to-date ICT infrastructure is important in the development of online lectures; this will help the school to improve on its ICT infrastructures.

vi. **Increase in Internal Generated Revenue:** The platform will allow the formulation and delivery of short-term/ executive training courses without the participants leaving their place of work. This will boost the IGR drive of the school.

vii. **Schooling beyond boundary:** Attending FSS, Oyo outside the geographical sphere of Nigeria as many are dreaming will no longer be a problem because you can become a student of FSS, Oyo without visiting Oyo.

6.2 Mode of operation of the online lecture

Lecture delivery in Surveying and Geoinformatics training involves theories and practicals, the online lecture series covered the theoretical aspect while the practical was carried out after COVID-19 lockdown when restriction was lifted on student gathering.

i. For effective lecture delivery, the students' timetable was restructured to two (2) courses (2 hours each) per day so that the student will not be bored with complain of power outage.
ii. Lecture materials were converted into PDF and sent to student online either as a whole course material for the semester or based on the topic been treated on daily/weekly basis by each course lecturer.
iii. During course delivery, some important concept like definitions may be highlighted in slide form for emphasis and the courses should be delivered by text and voice messages while the use of video recording may be adopted in a stringent situation that involve processes.
iv. In some courses that involve mathematical calculations, the lecturers should use the white maker board for the workings/ proofs while this should be screen shot and send online.
v. If more than one lecturer is taking a course, there shall be an agreement among the lecturers with the approval of head of the course to arrange and schedule who will take the lecture.
vi. Internet connection was provided by the school through IMS unit wirelessly via router.
vii. The school research room was also used because of constant supply of power.
viii. Lecturers may also wish to deliver lecture from their respective homes.

6.3 Proposed Timetable for the Students

For easy assimilation and conveniences, the new timetable was structured as follows;

Days/ Time	09:00 – 11:00	11:00 – 12:00	12:00 – 14:00
Monday	SUG 205	**BREAK**	BPH 221
Tuesday	GIT 201		SUG 209
Wednesday	GIT 203		GNS 121
Thursday	SUG 203		SUG 201
Friday	MTH 211		SUG 207

6.4 Proposed Online Lecture Platforms

There are numerous approaches to online lectures based on the available resources; the platforms are Zoom, WhatsApp, Team, Google classroom, etc. Many of the platforms have the capability of online lecture delivery through interactive mode via text, audio messages and

video messages. Some of these platforms have virtual experiences and all participants will see each other in a virtual reality. For the purpose of the proposed online lectures, three (3) platforms were proposed as follows:

a. WhatsApp
b. Zoom virtual classroom
c. Google classroom

6.4.1 **WhatsAp**p: WhatsApp platform is one of the most popular social network platform due to its affordability, popularity and low data consumption rate. Also, text and audio format of lecture delivery will be affordable to the students while video format will seldom be deployed.

a. Hardware and Software Requirements for WhatsApp

The hardware requirements are as follows;

i. Android/ Apple iOS mobile phone/ Tablet with functional camera and microphone.
ii. Internet enabled Laptop (if available/convenient)
iii. Headset, in case the one equipped with mobile devices are not functional.

The software requirements are as follows:

i. Up-to-date WhatsApp Application
ii. Photo-editing software
iii. Video editing software
iv. Microsoft PowerPoint
v. Microsoft word
vi. PDF converter

b. Other facilities required are

i. Internet connection through data subscription
ii. Wireless router
iii. Stable power source
iv. White board
v. Marker
vi. White board cleaning kit
vii. A well-lighted room

6.4.2 **Zoom virtual classroom:** Zoom allow individuals to meet and work together productively remotely/virtually when meeting in-person isn't possible. This makes meeting remotely much more human, in order to help users feel and stay connected. Zoom is a cloud-based video conferencing platform that can be used for video conferencing meetings, audio conferencing, webinars, meeting recordings, and live chat. Delivering virtual instruction can be achieved in two (2) different modes;

i. ***Teaching Live using Zoom (Synchronous):*** Teachers and students will click on the meeting link at the appropriate time and conduct class as usual.
ii. ***Recording Classes Via Zoom (Asynchronous):*** The teacher records the class and later send the link to the students

a. Hardware and Software Requirements for Zoom Room

To set up a Zoom Room, the following are required:

i. A computer to sync and run Zoom Classroom (zoom controller)
ii. A tablet/computer to launch the Zoom Class (teacher)
iii. A microphone
iv. HD camera
v. Speaker
vi. 1 HDTV monitor to display remote class participants and screen or presentation sharing
vii. An HDMI cable to share computer screens on the TV display, and an internet cable to hard-wire the connection.
viii. Strong Internet Connection (2.0 Mbps uplink 4.0 Mbps downlink for dual screen)
ix. A dedicated room for Zoom Room

6.4.3 **Google classroom:** Google Classroom is a free application designed to help students and teachers communicate, collaborate, organize and manage assignments, go paperless, and much more. This is a free education online application developed for communication of knowledge and ideas. Google Classroom is the result of Google bundling Google Calendar, Google Drive, Gmail, and other services into something simpler for teachers to use. It has many advantages over other platform such as paperless assignment, assessment and grading of students, YouTube functionality for posting videos, etc. For this to work effectively, it is expected for every teacher/ lecturer to set his/her Google classroom (using Gmail account) and add each of the courses to be lectured and subsequently add the students via Gmail account.

a. Hardware and Software Requirements

The hardware required is an Android/ Apple iOS mobile phone/ Tablet/ Computer.

The software requirements are as follows;

i. Up-to-date Google chrome browser
ii. Google classroom App from Google Playstore or iOS

Other facilities required are:

i. Internet connection through data subscription

ii. Wireless router
iii. Stable power source

7.0 IMPLEMENTATION OF THE APPROVED PROPOSAL

The technical committee submitted the proposal to the school management and due to the huge internet data subscription required by Zoom application which many students may not be able to afford, the school management approved the use of WhatsApp and Google classroom and that 70% for theories (online) while 30% should be for practicals while the school re-opens.

7.1 Training of the Facilitators

A one (1) day training was organized for the lecturers for effective and efficient online lecture. The training involved preparation of PowerPoint slides and voice narration, conversion of lecture materials to PDF, use of WhatsApp and Google classroom.

7.2 Online lecture delivery

A WhatsApp platform was created for the class and all the students, Course Lecturers, Head of Department, IMS Coordinator and Class Adviser were added to this platform. Online lecture delivery commenced with the students on Monday 22nd June, 2020 lasted for ten (10) weeks. 138 students registered for the online lectures and students' participation was impressive. Students' lecture attendance during the period was between 80% and 90% similar to what obtains during physical learning.

Google classroom was also created for the class to give students relevant course materials and assignment. Questions that could not be answered on WhatsApp platform were answered in the Google classroom.

7.3 Online tests/assessments

In order to assess students' level of understanding during the online lecture delivery, online test was conducted for each course. Each test comprised of 20 multiple choice questions, test link and unique test code was sent to each student. Students wrote the test at the same time at their various locations, the test was programmed not to allow any student write beyond the actual time allocated for the course. Test portal marked the script and displayed result to each student immediately. The results of the online tests are shown in Table 1.

Table 1: Analysis of Online Test Results

S/N	COURSE CODE	# OF STUDENTS	# STUDENT SCORE <40	FAIL %	# STUDENT SCORE ≥40	PASS %
1	BPH 221	110	27	24.5	83	75.5

2	GIT 201	110	22	20.0	88	80.0
3	GIT 203	110	12	10.9	98	89.1
4	GNS 121	114	1	0.9	113	99.1
5	MTH 211	107	29	27.1	78	72.9
6	SUG 201	107	12	11.2	95	88.8
7	SUG 203	110	22	20.0	88	80.0
8	SUG 205	112	30	26.8	82	73.2
9	SUG 207	109	41	37.6	68	62.4
10	SUG 209	111	9	8.1	92	82.9

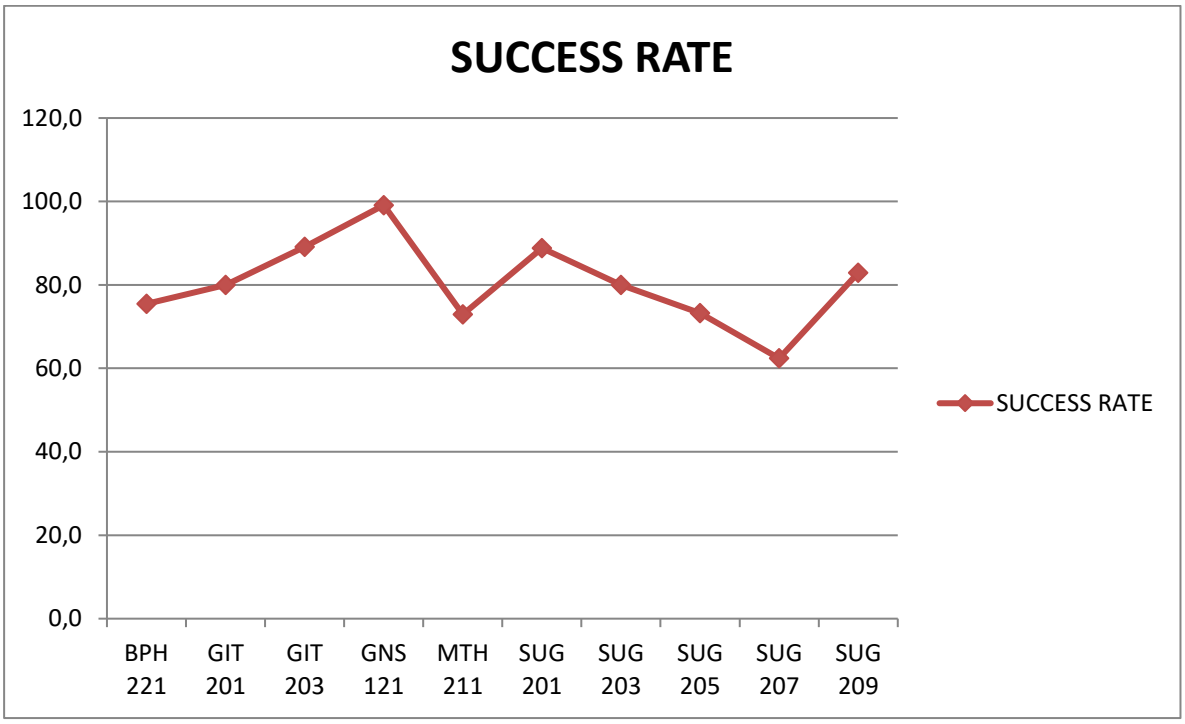

Figure 1: Online Test Success Rate

Plotting success rate as shown in figure 1 using pass percentage in table 1 shows that:

i. GNS 121 has the highest success rate of 99.1%
ii. GIT 201, GIT 203, SUG 201, SUG 203 and SUG 209 have success rate between 80.0% and 89.1%
iii. BPH 221, MTH 211 and SUG 205 have success rate between 72.9% and 75.5%
iv. The least success rate was recorded in SUG 207 with 62.4%

On resumption, revision classes were organized for students and practicals were conducted before they finally wrote semester examination. National Centre for Disease Control (NCDC)

guidelines were complied with during this period, the school management made provision for frequent hand washing, sanitizers, nose masks, temperature checks. Social distancing was maintained during revision classes and semester examination; no classroom accommodated more than thirty (30) students.

8.0 FINDINGS

i. The one day training organized for academic staff and the online lectures exposed lecturers to some new features in Microsoft PowerPoint and other application software used for preparation of lecture materials and slides such as attaching voice narration to slides and video creation with PowerPoint.
ii. Attendance was taken before and after each lecture to monitor students' participation in the online lectures. Records showed that between 80% and 90% of registered students participated in the online lectures.
iii. Questionnaires administered to the students during the lectures showed they really enjoyed online lectures
iv. Combination of WhatsApp and Google Classroom made it easy for lecturers to attend to each student after the scheduled lectures. Additional materials and assignment were given in the Google Classroom.
v. Students were able to participate in the online test and their performance was above average.

9.0 CHALLENGES

i. Blended learning requires time and willingness to learn new things on the part of both lecturers and students. Lecturers were properly trained for the task ahead; the technical committee and the school management continued to encourage and motivate lecturers who later guided, monitored progress and boosted confidence in students during online lectures
ii. Two students did not participate in the online lectures; they claimed to live in remote areas and did not have access to internet.
iii. Few registered students did not participate in the online lectures due to fact that they could not afford android phones, such students printed lecture materials to read at home and later joined revision classes when the school re-opened
iv. Few students did not participate in the online test due to lack of fund to purchase data, poor internet speed other related technological problems. The affected students were allowed to write another test after school resumption

10.0 CONCLUSION AND RECOMMENDATIONS

The online lecture/ meeting platforms had proved to be the only means of communicating ideas during this work-from-home period. Academic institutions had also benefitted from this

technological innovation of online lecture to ensure continuous/ smooth running of academic activities. Federal School of Surveying, Oyo adopted and successfully implemented blended (hybrid) learning for the final year National Diploma (ND) students. The following are recommended:

i. Federal and state government should install appropriate facilities that will support online lecture delivery in the government-owned institutions.
ii. There should be supports for both staff and students of these institutions so that they can key into the programme properly.
iii. Government should ensure stable power supply and good internet speed in the higher institutions for smooth transition from old teaching method to the new web-based method.

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BIOGRAPHICAL NOTES

Olufemi Felix IYIOLA

He is a Doctorate degree student at Nnamdi AZikiwe University, Awka, Nigeria. He holds M.Sc. in Surveying and Geoinformatics with specialization in GIS and Remote Sensing from the same University. He is a Chief Lecturer and Head of Department of Surveying and Geoinformatics at Federal School of Surveying, Oyo, Nigeria. He is a registered Surveyor and a full member of the Nigerian Institution of Surveyors.

Saheed Salawudeen OLANIYI

He is a Master's degree student at Nnamdi Azikiwe University, Awka, Nigeria. He is a lecturer at the Department of Surveying and Geoinformatics, Federal School of Surveying, Oyo, Nigeria. He is a registered Surveyor and a full member of the Nigerian Institution of Surveyors.

Michael Okegbola

He holds M.Sc. in Surveying and Geoinformatics from the University of Nigeria, Nsukka. He is a lecturer at the Department of Surveying and Geoinformatics, Federal School of Surveying, Oyo, Nigeria. He is a registered Surveyor and a full member of the Nigerian Institution of Surveyors.

Ajiboye Oyesiji OYEYODE

He holds M.Sc. in Surveying and Geoinformatics with specialization in Geodesy and Geodynamics from the University of Nigeria, Nsukka. He is a lecturer at the Department of Surveying and Geoinformatics, Federal School of Surveying, Oyo, Nigeria. He is a registered Surveyor and a full member of the Nigerian Institution of Surveyors.

CONTACTS

Olufemi Felix IYIOLA,

Head of Department

Department of Surveying and Geoinformatics,

Federal School of Surveying, P.M.B. 1024, Oyo, Oyo State, Nigeria.

e-mail: felixiyiola@yahoo.com

GSM Number: +2348033955301

Saheed Salawudeen OLANIYI

Department of Surveying and Geoinformatics,

Federal School of Surveying, P. M. B. 1024, Oyo, Oyo State, Nigeria.

e-mail: sagasofts@yahoo.com

GSM Number: +2348038078266

Michael Okegbola

Department of Surveying and Geoinformatics,

Federal School of Surveying, P. M. B. 1024, Oyo, Oyo State, Nigeria.

e-mail: digitalspace2012@gmail.com

GSM Number: +2348038076791

Ajiboye Oyesiji OYEYODE

Department of Surveying and Geoinformatics,

Federal School of Surveying, P. M. B. 1024, Oyo, Oyo State, Nigeria.

e-mail: boyee4real@yahoo.com

GSM Number: +2348062811091