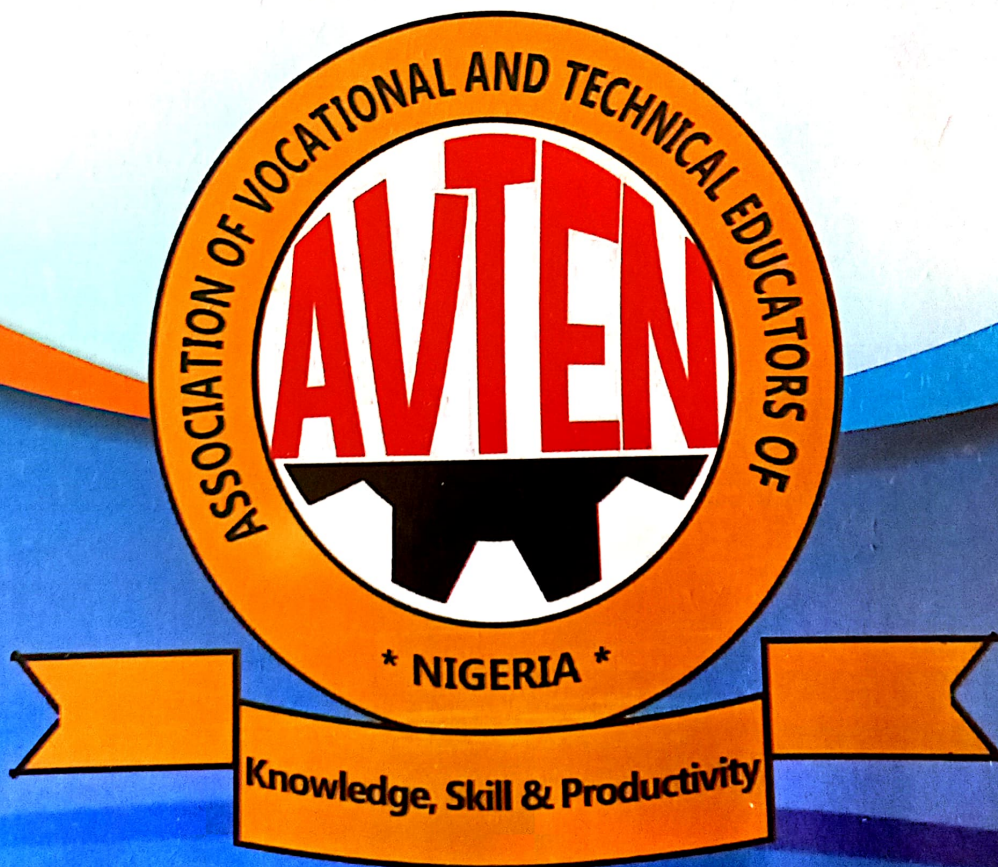


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(Formerly Nigerian Vocational Association Journal (NVAJ))



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SKILLS REQUIRED BY AGRICULTURAL SCIENCE TEACHERS IN DELIVERING VIRTUAL INSTRUCTIONS AS AN ALTERNATIVE TEACHING MEDIUM IN INSURGENCY PRONE AREAS

BY

ADESANYA, EMMANUEL OLORUNLEKE & ANI, OLUWATOYIN MARY

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Abstract

The kidnappings and killings of students leading to school closure due to insurgency and insecurity situations in Nigeria necessitate alternative instruction delivery mode for uninterrupted agricultural teaching. This study determined skills required by agricultural science teachers in delivering virtual instructions as alternative teaching medium in insurgency prone areas. The study was done in Kwara state. Survey research design was adopted. Four research questions guided the study. The study population was 236 secondary school agricultural science teachers. Multistage sampling technique was used to select 95 agricultural science teachers for the study. Researcher-designed questionnaire was the instrument for the study. Validation of instrument was done by experts in agricultural and computer education. The reliability coefficient of 0.65 was obtained using Cronbach-alpha. Data analysis was done using mean and standard deviation. Results revealed that pedagogical, technological, management and communication skills are highly required by Agricultural science teachers in delivering virtual instructions in era of insecurity. The study concluded that teachers require virtual instructional skills for uninterrupted agricultural science delivery in insecurity situations. Recommendations include integration of virtual instructional delivery skills into pre-service agricultural science teachers' programmes, and organization of workshops for agricultural science teachers on virtual instructional delivery in insurgency prone areas among others.

Key words: *Insecurity, virtual-instruction, skills, alternative, teaching medium, insurgency.*

Introduction

The roles that agricultural education plays in human development for the agricultural sector cannot be quantified. Agricultural Education is the aspect of education that is concerned with the training of human resources for the agricultural sector. Ochu (2020) defined agricultural education as the branch of education and discipline that is saddled with the teaching of agriculture, natural resources and land management necessary for the growth and stability of the society. The author noted that it is undertaken to prepare students for employment in the agricultural sector. Aneke (2010) remarked that agricultural education is a special field that trains students on the skills and competencies in agricultural production and methodologies in teaching. Thus, agricultural education is concerned with the training of teachers who are to teach agriculture at various levels of education

as well as the acquisition of skills for agricultural production. By implication, Agricultural education produces the teachers that teach agriculture at primary, secondary and tertiary levels of education as well as produces people who will engage in actual production of crops and animals by equipping them with skills, scientific and technical capabilities required for agricultural production. Agricultural education helps to update the knowledge and skills of producing farmers with latest and modern technologies in agriculture.

In spite of the laudable roles that agricultural education plays in the agricultural sector, it is confronted with some challenges which have slow down or sometimes hinder its progress. Among these hindrances are lack of fund, inadequate teaching facilities, poor perception towards agriculture, and climate change issue (Ibrahim, 2014). As solutions are being sought to reduce or completely obliterate the effect of the

above problems in agricultural education and training, another major problem that is subtly and sometimes openly hinders smooth execution of agricultural education programme which surfaces is insurgency.

Insurgency has been affecting agricultural productivity for sometimes but its subtle effects on agricultural education and training has not been noticeable. Insurgency is defined by Walter (2022) is a violent struggle by a group of people who refuse to accept the power of their government. It is an occasion when a group of people want to take control of their country by force and violence. Insurgency is an insurrection against government by a group of people through a violent means like bombing, kidnapping or abduction of innocent citizens, looting and a host of others. It triggers insecurity. Insurgency has been defined by Haviland (2012) as a coordinated movement aimed at the overthrow of a constituted government through the use of subversion and armed conflict. Unal (2016) defined insurgency as a political movement aimed at realizing a specific political goal which is generally to overthrow a regime. Adedire, Ake and Olowojolu (2016) citing Counter-Insurgency Initiative defined insurgency as the organized use of subversion and violence to seize, nullify, or challenge political control of a region. Adedire, Ake and Olowojolu (2016) explained that insurgents seek to subvert or displace the government and completely or partially control the resources and population of a given territory. Insurgents tend to achieve their aim through the use of force in form of guerrilla warfare, terrorism, coercion or intimidation, propaganda, subversion, and political mobilization. Insurgency in Nigeria is achieving their aim through terrorism.

Terrorism is defined as the systematic use of violence and intimidation to coerce a government or community into acceding to specific political demands (Pearsall & Trumble, 2006). With this definition terrorism and insurgency are closely related, they are two sides of coin. There virtually no way one can engage in one without perpetrating the other. Insurgents achieve their aim through the instrumentality of terrorism. Insurgency and terrorism was alien to Nigeria until the advent of Boko Haram insurgent in 2009. Uzochukwu (2014) remarked that Boko Haram which translates into "western education is forbidden" has an ideology rooted in fundamentalist Sunni Islam, has the main goal of establishing an Islamic state in Nigeria and to rid the nation of all Western influence. This group who emanate from the Northern region of the country has spread its tentacles to many parts of the country and has carried out various terrorist activities that have led to loss of life and properties. France Diplomacy (2022) reported that Boko Haram remains one of the world's deadliest terrorist groups which has killed more than 1,500 people in 2017 and caused the displacement of 2.4 million people in Nigeria and 200,000 in neighboring countries.

The negative effect of insecurity triggered by insurgency and terrorism on the educational sector cannot be quantified. Insurgency has led to abduction of scores of students or learners from their school. Lots of students have been killed by stampede or by direct shooting or abducted during the raid of schools by insurgents. School teachers have also been killed or abducted by insurgents. The first attacks on educational facility by the terrorists and insurgents in Nigeria was the abduction of over 250 Chibok school girls on 15 April 2014 in their hostels (Uzochukwu, 2014). Also, on February 19, 2018, at 5:30 pm, 110 schoolgirls aged 11–19

years old were kidnapped by the Boko Haram terrorist group from the Government Girls' Science and Technical College Dapchi (Nederhand, (2020). Although these challenges have certainly caused considerable degree of inconvenience, it has however prompted the need to think of an alternative means of reaching the learners through the use of virtual learning. Alternative teaching and learning medium will transcend sitting in the four walls of a classroom. A teaching and learning medium where teacher can reach their learner irrespective of whether they are in school, at home or in refugee camps.

Alternative teaching medium as defined by Nurutdinova, Perchatkina, Zinatullina, Zubkova, and Galeeva (2016) is a general term for any teaching method that is intended to replace the traditional frontal teaching method in which a teacher stands at the front of a classroom and transmits material. Alternative teaching and learning medium in this context is any teaching and learning platform that will facilitate interaction between teachers and learners without necessarily having a physical or face to face contact. Khalaily (2019) identified varied methods that are regarded as alternative teaching methods in this 21st century to include project-based learning, exploratory learning, collaborative learning, and integration of technologies in teaching. Thus, the alternative teaching medium that aligns with the context of virtual instructions in this study is integration of technology. It is that medium which allows for teaching and learning activities to proceed with minimal or no difficulties irrespective of whether there is room for physical interaction or not. This alternative teaching and learning medium make it possible for learners not to have their educational pursuit hindered due to the activities of insurgents or any disruptions. With this mode of learning, students can access their learning

materials in their homes when it is unsafe to attend physical classes as well as in their classes when the school is opened. The alternative medium which could meet this need in this era of Information and Communication Technology is virtual teaching and learning medium.

Virtual education is the process of using online classroom environments to disseminate learning material to learners. Virtual teaching and learning processes involve the use of digital technologies that enable teachers and students not to be physically present in the same room (Alaba & Emmanuel, 2020). Virtual learning according to Clark and Mayer (2013) is instruction delivered on a digital device that is intended to support learning. Virtual teaching has been given different names like open teaching, web-based teaching, computer-mediated teaching, blended teaching among others. All these medium of teaching and learning has in common the ability to use a computer or mobile devices connected to a network or radio/television set that offers the possibility to teach from anywhere, at any time, in any rhythm, and by any means (Cojocariu, 2014). This is facilitated through the instrument of varied video-calling based teaching and learning platforms or applications such as Google classroom, Microsoft teams, zoom, Google meet and online learning platforms via Literature/ Videos such as YouTube, Facebook, WhatsApp and host of others (Mukesh. Pushpendra & Pushpendra, 2020). With these leaning environment or medium, students can be at home or somewhere else and still enjoy the lesson. Karp and McGowan (2020) noted that it is the only mode of teaching that can be of help in passing instructions to students in a time when there are distancing between the learner and the teacher due to disaster, terrorism or other factors..

The benefits of virtual teaching and learning are enormous; Bell and Federman (2013) argued that virtual learning has the potential to afford and support access to higher education for those who have socioeconomic, academic, and health issues that prevent them from attending on-site classes. Teaching through virtual means could provide opportunities for online instructors to learn about the principles of instructional design and technology, online pedagogies, and emergent technologies (Alman & Tomer, 2012). Virtual teaching and learning is becoming more important for education in time of emergencies like disease outbreak, disasters and terrorist attacks or insurgency, thereby offering the opportunity to remain in touch, even if remotely, with classmates and teachers and to follow lessons in any subject including agriculture.

Virtual learning in agriculture could help in gathering resources and knowledge from diverse sources that may otherwise be unobtainable. Virtual learning and teaching in agriculture, promotes active and independent learning because video instructions that or audio learning materials can be rewound, seen and heard again for better understanding of agricultural concepts. Virtual teaching and learning also affords the teachers and students access to divers materials as compared to the traditional teaching practices. Thus, the adoption of virtual learning by agricultural science teachers is necessary especially in insurgency and terrorism prone areas. However, in order to be able to effectively utilize these virtual learning tools, agricultural science teachers must possess expected skills for its execution. According to Elbert and Alston, (2015) virtual learning in agriculture related fields is still in the early phases of adoption, hence most agricultural science teachers may not be well equipped to make use of it.

Teachers' readiness and skills in using virtual learning platforms plays an important role in delivering virtual instructions as an alternative teaching medium for agricultural science. Teachers need sufficient skills to be confident in adopting virtual platforms under varied settings. Teachers will require understanding of the pedagogical role of Information and Communication Technologies, in order to use virtual means meaningfully in their instructional process (Hennessy, 2015). Various knowledge and skills that teachers need to possess for successful implementation of virtual teaching and learning have been identified by researchers. Craddock and Gunzelman (2013), Munoz (2013). Haughton, Sandt and Slantcheva-Durst (2014) identified content skills, design skills, pedagogical skills, management skills and communication skill as the skills required for executing virtual instructions. Blackerby (2012) found presentation and teaching skills, multimedia, instructional design, interaction, copyright, evaluation, web design and application and organizational skills as the skills identified by experts for incorporation of online teaching while Abdulla (2014) reported that students affirmed online instructor's intellectual role is ensuring effective communication skills necessary to encourage student interaction. All these skills and competencies can help in designing and creating professional development opportunities for online educators (Baran & Correia, 2014). Although it has been noted by Thach (2014) that the competencies identified were not of equal importance across roles however, interpersonal communication skills were determined to be the most critical competency across all roles for delivering of online instructions. In view of the various submissions on the skills required for adopting virtual teaching and learning coupled with the important place of agriculture education as well

as the necessity to cater for the educational needs of learners in insurgency and terrorism prone areas among which is Kwara state this study is conceived.

Kwara state being one of the states in the Northern region of Nigeria is also having its share of the insecurity situations in the country. Oladipupo (2022) remarked that insecurity is like cancer and if not quickly attended to, could spread to other parts of the body. The author noted that this is the situation of Kwara State which has witnessed 154 and 1144 deaths in recent times after consistent attacks from armed criminal gangs. Shittu (2022) reported that a pressure group in Kwara state known as Kwara for Kwara Movement had raised an alarm over the massive influx of terrorists and kidnappers to the state from the neighboring Niger State. The Nigeria Security and Civil Defense Corps (NSCDC) in the state reported the invasion of a rural community called Anguwa Danlami in Edu Local Government Area (Shittu, 2022). In a similar development, residents of Obbo-Ayegunle in Ekiti Local Government had raised the alarm that five suspected bandits had arrived in the area and were threatening to unleash mayhem in the forms of kidnapping and killing unless the inhabitants provided them with the sum of N2 million. The report said that the criminals have already invaded the northern forests of the state so as to cause mayhem on the residents of the areas. The above shows the insecurity situation in Kwara state which could result in closure of schools or create the fear of attending physical classes in the nearest future. This has brought about the need for educators to be proactive in sensitizing the teachers about the need to acquire skills for virtual instructions. Although the state is not part of the states at the center of terrorism and insurgents activities, however the state has had its fair share of the

insecurity situations in the country in form of abduction of school children there is the need to seek the opinion of teachers who are the end users of virtual learning medium on the skills they will require to execute virtual instructions. Hence, the need for this study to determine the skills required by agricultural science teachers in delivering virtual instructions as an alternative teaching medium in insurgency prone areas.

The specific objectives that the study sought to pursue include:

1. determine the pedagogical skills required by Agricultural science teachers in delivering virtual instructions in insurgency prone areas
2. determine the technological skills required by Agricultural science teachers in delivering virtual instructions in insurgency prone areas
3. determine the management skills required by Agricultural science teachers in delivering virtual instructions in insurgency prone areas
4. identify the communication skills required for Agricultural science teachers in delivering virtual instructions in insurgency prone areas.

Research Questions

The following research questions were raised to guide the study:

1. What are the pedagogical skills required for Agricultural science teachers in delivering virtual instructions in insurgency prone areas?
2. What are the technological skills required for Agricultural science teachers in delivering virtual instructions in insurgency prone areas?
3. What are the management skills required for Agricultural science teachers in delivering virtual instructions in insurgency prone areas?
4. What are the communication skills required for Agricultural science teachers in delivering

virtual instructions in insurgency prone areas?

Methodology

This study adopted descriptive survey research design. Descriptive survey research according to Ashlock and Mishra (2017) consists of survey and fact-finding investigation which has the main purpose of descriptive explanation of the set of circumstances as it is present as such. The major purpose of descriptive research is to provide a description of the state of affairs of a phenomenon as it exists at present. Descriptive research design was used for this study because the researcher is interested in obtaining the opinion of a representative sample of a target population so as to be able to draw references about the entire population regarding the skills they require for virtual teaching.

The population for the study comprised of 236 agricultural science teachers in Kwara state Nigeria. Multistage sampling technique was used to select 95 agricultural science teachers for the study. This involved purposively sampling Agricultural science teachers for the study while simple random sampling technique was used to select five local government areas for the study. In each local government, five secondary schools were randomly selected from which fifteen agricultural and animal husbandry teachers were selected as respondents for the study. The respondents for the study comprises of 55 female and 40 male agricultural teachers. Twenty-one of the teachers had NCE, 62 had B.Sc. /B.Sc. (Ed) while 12(12.6 %) had M.Sc. /M.Ed. Seventy among the agricultural teachers had 1-10 Years' experience while 25 of them had 11-20 Years' experience.

The research instrument was a structured questionnaire entitled Skills Required for Agricultural science teachers in Delivering Virtual Instructions as an Alternative Teaching Medium in Insurgency prone areas. The questionnaire was made up of sections A and B. Section A was based on the demographic information of the respondents while section B elicited information on the pedagogical, technological, management and communication skills required by Agricultural science teachers in delivering virtual instructions as an alternative teaching medium in pandemic era. A four-point rating scale of Highly Required (HR), Required (R), Less Required (LR) and Not Required (NR) respectively was adopted for the response option and was scored as 4 (HR), 3 (R), 2 (LR) and 1 (NR). Any mean value above 2.50 will be deemed as required while any value less than 2.5 will be taken as not required. Specifically the values will be interpreted as follows: 3.50-4.00(HR), 2.50-3.49 (R), 1.50-2.49 (LR), 0.00-1.49 (NR).

Validation of instrument was done by experts in Agricultural and Computer Education from the Department of Science Education and Educational Technology respectively of University of Ilorin, Nigeria.. The reliability coefficient of the instrument was obtained using Cranach-alpha after it was administered to agricultural science teachers in areas not covered by the study. Therefore, a reliability coefficient of 0.65 was obtained. The instrument was administered to the respondents and on the spot collection was done. The data obtained was analyzed using descriptive statistics of frequency and percentages for the demographic information while the statistical tools of mean and standard deviation was used to analyze the research questions.

Results

The results of this study are presented in tables 1-4

Research Question 1: What are the pedagogical skills required for Agricultural science teachers in delivering virtual instructions in insurgency prone areas?

Table 1: Frequency, Mean and Standard Deviation of pedagogical skills required by Agricultural science teachers in delivering virtual instructions in insurgency prone areas

S/No.	pedagogical skills required by Agricultural science teachers in delivering virtual instructions in Insurgency Prone Areas	Mean	Std. Dev.	Remark
		3.62	0.51	Highly Required
1	Ability to set realizable objectives for the lesson based on the virtual mode to be adopted considering the nature of agricultural science	3.47	0.50	Required
2	Ability to design agricultural instructions suitable for the virtual platform to be used	3.47	0.56	Required
3	Ability to present agricultural lesson in such a way that it will be accessible to all the intended learners irrespective of their location	3.46	0.52	Required
4	Ability to present lessons in agriculture in diverse forms that will cater for different learning styles and academic levels	3.48	0.54	Required
5	Ability to promote group interaction, collaboration, and teamwork using suitable learning platforms	3.51	0.54	Highly Required
6	Skills in giving practical works or tasks that will promote agricultural skill acquisition on virtual platforms	3.53	0.52	Highly Required
7	Having in-depth understanding of the course technologies sufficient to help students with basic technical issues	3.44	0.50	Required
8	Ability to use questions that promote discussion among learners	3.47	0.54	Required
9	Skills in carrying out practical classes or demonstrations on virtual platforms	3.39	0.49	Required
10	Being able to use questions that promote higher order thinking while delivering virtual instructions	3.58	0.54	Highly Required
11	Ability to guide the class towards understanding course topics in a way that helps students clarify their thinking.	3.43	0.54	Required
12	Ability to demonstrate flexibility in efforts to accommodate different student needs/circumstances, learning styles.	3.47	0.54	Required
13	Ability to give assessments that will reveal learners' attainment of learning objectives based on the learning platforms used	3.52	0.60	Highly Required
14	Skills in assessing practical assignments or projects using virtual platforms			

The data presented in table 1 shows that the 14 items on the pedagogical skills had mean values ranging from 3.39 to 3.62 which were above the cut-off mark of 2.50. This indicate that all the listed pedagogical skills are required by agricultural science teachers for delivering virtual

instructions in insurgency prone areas. The standard deviation of the items which ranges from 0.49 to 0.54 is also an indication that there is less variability in the responses of the teachers from the mean point; meaning that, the teachers are close in their responses.

Research Question 2: What are the technological skills required for Agricultural science teachers in delivering virtual instructions in insurgency prone areas?

Table 2: Frequency, Mean and Standard Deviation of Technological Skills required by Agricultural science teachers in Delivering Virtual Instructions in insurgency Prone area

S/No.	Technological skills required by Agricultural science teachers in delivering virtual instructions in Insurgency Prone Areas	Mean	Std. Dev.	Remark
1	Skills in generating invite link or other keys that will be used in creating awareness and access to the e-learning classroom for the learners	3.52	0.58	Highly Required
2	Skills in using the e learning devices in managing the class e.g. preventing noise.	3.41	0.50	Required

3	Skills in using the e learning platforms and devices in creating contents in a presentable manner	3.36	0.52	Required
4	Skills in using basic e-learning tools that will promote knowledge and skills acquisition in agriculture	3.33	0.47	Required
5	Ability to choose the appropriate learning platforms that will accommodate the peculiarities suitable for teaching Agriculture	3.41	0.50	Required
6	Skills in accessing various technological resources and tools, such as email, Internet browsers, LMSs, text and video chat applications and productivity software and applications for teaching	3.42	0.52	Required
7	Skills in applying all the technical procedures used to create, e-content, such as e- books and instructional videos especially as it relates to agriculture	3.38	0.51	Required
8	Proficiency in utilizing the right tools and platform that will accommodates all the peculiarities of teaching agriculture	3.45	0.52	Required
9	Ability to understand the learning and teaching capabilities and limitations of e-learning tools and platforms	3.51	0.58	Highly Required
10	Skills in using the latest updates and renovations of educational technology and software	3.51	0.50	Highly Required
11	Skills in detecting and solving technical issues which occurs while teaching	3.49	0.56	Required
12	Being proficient with the technologies used in the online classroom.	3.52	0.50	Highly Required

Table 2 presents the mean values of agricultural science teachers on the technological skills required for delivering virtual instructions in insurgency prone areas. Items 1 to 12 recorded mean response of 3.33 to 3.52 which were above the cut-off mark of 2.50, therefore implying that

agricultural science teachers require all the technological skills listed in order to be able to deliver virtual instructions in insurgency prone areas. The standard deviation of the items ranges from 0.47 to 0.58 showing that the respondents are close in their opinion.

Research Question 3: What are the management skills required for Agricultural science teachers in delivering virtual instructions in insurgency prone areas?

Table 3: Frequency, Mean and Standard Deviation of Respondents on Management Skills required by Agricultural Science Teachers in Delivering Virtual Instructions in Insurgency Prone Areas

S/No.	Management Skills Required by Agricultural Science Teachers in delivering Virtual Instructions in Insurgency Prone Areas	Mean	Std. Dev.	Rem.
1	Skills in organizing class layout in a way that students would learn easily	3.32	0.76	Required
2	Skills in grouping students in large classes	3.18	0.74	Required
3	Choosing the virtual platform with adequate bandwidth to accommodate internet traffic use	3.37	0.51	Required
4	Ability to make adequate decision that can ensure effective use of e-learning tools	3.41	0.54	Required
5	Ability to motivate workers (technicians and students) to work efficiently and productively on the virtual platform	3.33	0.71	Required
6	Being able to coordinate personnel and manage other factors responsible for putting e-learning tools in place	3.40	0.61	Required
7	Being able to clarify the roles and expectations of the instructor and the learners	3.48	0.62	Required

Data in table 3 reveals that the mean for all the seven management skills required for delivering virtual instructions in Insurgency prone areas had mean values ranging from 3.18 to 3.48 indicating that agricultural science teachers required all the management skills listed to deliver virtual

instructions in insurgency prone areas. The standard deviation which ranges from 0.51 to 0.76 is also an indication that there is less variability in the responses of the agricultural science teachers.

Research Question 4: What are the communication skills required for Agricultural science teachers in delivering virtual instructions in insurgency prone areas?

Table 4

Frequency, Mean and Standard Deviation of Respondents on Communication Skills required by Agricultural science teachers in Delivering Virtual Instructions in insurgency prone areas

S/No.	Communication skills required by Agricultural science teachers in delivering virtual instructions in Insurgency Prone Areas	Mean	Std. Dev.	Rem.
1	Ability to communicate effectively with helpdesk and technical staffs when technical fault occurs on virtual learning platforms	3.65	0.50	Highly Required
2	Skills in using scientific terms, symbol, measurements, units and other quantities on a virtual platform	3.37	0.55	Required
3	Being able to process and circulate information to students quickly	3.37	0.65	Required
4	Ability to use agricultural way of thinking and languages in the presentations of lessons on virtual platforms	3.39	0.67	Required
5	Ability to clearly communicate expected student behaviors	3.49	0.63	Required
6	Ability to create and develop respectful relationships and a sense of community among the learners	3.63	0.49	Highly Required
7	Ability to show sensitivity and empathy when communicating online	3.45	0.56	Required
8	Being able to use different communication methods to ensure accessibility by learners	3.37	0.53	Required
9	Ability to resolve conflicts and misunderstandings amicably which may arise while learning on virtual platform	3.36	0.59	Required

Table 4 presents the communication skills required by Agricultural science teachers in delivering virtual instructions in insurgency prone areas. The table revealed that all the listed skills have mean value above 2.50 which implies that agricultural science teachers require all the skills for delivering virtual instruction in insurgency prone areas. The mean value ranges from 3.36 to 3.65 meaning that some of the skills were highly required by agricultural science teachers. Also the standard deviation which ranges from 0.50 to 0.67 is an indication that there is less variability in the response of the teachers

Discussion

The findings of the study indicated that farmers require ability to set realizable objectives for the lesson based on the virtual mode to be adopted considering the nature of agricultural science; ability to design agricultural instructions suitable for the virtual platform to be used; ability to present agricultural lesson in such a way that it will be accessible to all the intended learners

irrespective of their location; ability to present lessons in agriculture in diverse forms that will cater for different learning styles and academic levels; ability to promote group interaction, collaboration, and teamwork using suitable learning platforms; skills in giving practical works or tasks that will promote agricultural skill acquisition on virtual platforms; having in-depth understanding of the course technologies sufficient to help students with basic technical issues; ability to use questions that promote discussion among learners; skills in carrying out practical classes or demonstrations on virtual platforms; being able to use questions that promote higher order thinking while delivering virtual instructions; ability to guide the class towards understanding course topics in a way that helps students clarify their thinking; ability to demonstrate flexibility in efforts to accommodate different student needs/circumstances, learning styles; ability to give assessments that will reveal learners' attainment of learning objectives based on the learning platforms used; and skills in assessing

practical assignments or projects using virtual platforms as pedagogical skills in delivering virtual instructions in insurgency prone areas. All the respondents' agreed that they require each of the pedagogical skills listed on table 1.

This is very important because virtual medium is completely different from physical classes where if teachers does not even have much pedagogical skill, students can still learn from the teacher due the fact that they are interacting physically and student can still decode the message the teacher is trying to pass across because they are seeing the teacher physically. However, under virtual medium, teaching without pedagogical skills may amount to chatting or entertaining the learners. This in line with the submission of Hogle (2017) that virtual teaching entails applying everything the teacher knows about adult learning principles. The author noted further that the teacher is not a sage on stage just because he/she can't see people and that it's not lecturing nor presenting but facilitating which entails the adoption of pedagogical skills. Also, the submissions of Craddock and Gunzelman (2013) further corroborates the need for pedagogical skills by stating that teachers adopting virtual instructional medium requires ability to: express and master extensive knowledge of the content, state learning goals and objectives that coincide with learners' levels and characteristics, draft and develop learning and assessment activities that align with learning goals and objectives and ability to develop a course outline that includes all course components and elements. Onipede, Lawal and Saminu (2019) also identified several pedagogical skills required by junior secondary schools agricultural teachers in Gombe state. This implies that teachers in the current study actually require pedagogical skills to execute virtual instructions.

The study further revealed that the technological skills required by agricultural teachers in delivering virtual instructions in an insurgency prone areas include: Skills in generating invite link or other keys that will be used in creating awareness and access to the e-learning classroom for the learners; Skills in using the e learning devices in managing the class e.g. preventing noise.; Skills in using the e learning platforms and devices in creating contents in a presentable manner; Skills in using basic e-learning tools that will promote knowledge and skills acquisition in agriculture; Ability to choose the appropriate learning platforms that will accommodate the peculiarities suitable for teaching Agriculture; Skills in accessing various technological resources and tools, such as email, Internet browsers, LMSs, text and video chat applications and productivity software and applications for teaching; Skills in applying all the technical procedures used to create, e-content, such as e- books and instructional videos especially as it relates to agriculture; Proficiency in utilizing the right tools and platform that will accommodates all the peculiarities of teaching agriculture; Ability to understand the learning and teaching capabilities and limitations of e-learning tools and platforms; Skills in using the latest updates and renovations of educational technology and software; Skills in detecting and solving technical issues which occurs while teaching; Being proficient with the technologies used in the online classroom.

The responses of the agricultural science teachers to all the items is an indication that technological skill is required for teachers to deliver instructions through virtual means. Since virtual teaching and learning involve the use of information and communication technology

gadgets or devices in instructional delivery, hence no virtual teaching and learning can take place without the teacher having the knowledge of how to operate a computer and engage the use of some teaching platforms. This is in accordance with the statement of Haughton, Sandt and Slantcheva-Durst (2014) that the technological skills for virtual teaching include ability to access various technological resources and tools, such as email, internet browsers, LMSs, text and video chat applications and productivity software and applications. It involves being alert to the latest updates and renovations of educational technology and software and ability to understand the learning and teaching capabilities and limitations of these virtual learning tools. Similarly, Hogle (2017) remarked that facilitating in a virtual classroom or teaching a live online session requires that the instructor be comfortable with the virtual classroom platform. The author noted that the instructor needs to be able to switch among presenting, the whiteboard, and interacting with learners, in order to use the features that enhance online sessions and that it a facilitator who is comfortable with the technology and the platform can cope with these multitask without getting flustered.

It was found from the study that agricultural science teachers require management skills like: skills in organizing class layout in a way that students would learn easily; skills in grouping students in large classes; choosing the virtual platform with adequate bandwidth to accommodate internet traffic use; ability to make adequate decision that can ensure effective use of e-learning tools; ability to motivate workers (technicians and students) to work efficiently and productively on the virtual platform; being able to coordinate personnel and manage other factors responsible for putting e-learning tools in place;

and being able to clarify the roles and expectations of the instructor and the learners to deliver instructions through virtual means in insurgency prone areas. This is buttressed by the fact that all the skills listed on table 4 were affirmed as required by the teachers.

These management skills are required because any activities that involves few or large group of people will always require the ability of the convener to manage the people involved, so also is the case of virtual teaching, any teacher who intends to teach or deliver instructions virtually will need the skill to manage the online platforms like admitting students to access the lecture, control submission of exercises, control contributions to the class to avoid noise and interference. This is in line with the findings of Williams (2020) who stated that a teacher teaching virtually ought to be able to clarify the roles and expectations of the instructor and the learners, manage the course time and apply time-saving techniques. He/she should be able to demonstrate leadership, management, mentoring, and coaching skills, as well as knowledge of administrative qualities and procedures and being able to establish rules and regulations for participation, declare communication protocols for submission of assignments, timeliness, sending and seeking feedback. In another dimension Hogle (2017) stated that online teachers often focus heavily on presenting and forget all the other aspects of teaching online, However the teacher should cultivate the skill of focusing on different parts of the screen, by watching the chat, looking for people raising their hand, and facilitating an activity.

Lastly the study revealed that respondent require: ability to communicate effectively with helpdesk and technical staffs when technical fault occurs on virtual learning platforms; skills in using

scientific terms, symbol, measurements, units and other quantities on a virtual platform; being able to process and circulate information to students quickly; ability to use agricultural way of thinking and languages in the presentations of lessons on virtual platforms; ability to clearly communicate expected student behaviors; ability to create and develop respectful relationships and a sense of community among the learners; ability to show sensitivity and empathy when communicating online; being able to use different communication methods to ensure accessibility by learners; ability to resolve conflicts and misunderstandings amicably which may arise while learning on virtual platform as communication skills in order to engage in virtual instructional delivery in insurgency prone areas.

This was attested to by the Agricultural teachers affirming the requirement of communication skill in virtual teaching. This is because virtual platform is different from physical class where student can gain from both verbal and non-verbal gestures of the teacher. In virtual teaching teacher will be required to make all instructions clear and understandable to the learner by possessing good communication skill for the objective of the teaching exercise to be achieved. This findings is also in accordance with Indeed Editorial Team (2021) that having great oral and written skills is important when working as a virtual assistant as there is no physical form of contact, learners must rely on emails, phone calls, learning platforms and video calls to communicate. Hence being able to write and speak clearly helps provide a positive experience to all who communicate with the virtual teacher which results in positive feedback. Hogle (2014) also stated that a unique challenge of virtual classroom instruction is creating a bond with learners when they are not visible, thus it's

important that teacher possess the skill in building rapport with learners and ensure human connection. This entails engaging with learners, rather than just presenting information, encouraging learners to ask questions, and soliciting participation through frequent engagement by asking poll questions or asking learners to type a response in chat; sharing the whiteboard with learners so they can contribute to a discussion or help create a list. In addition, Baran and Correia (2014) also reported the ability to: facilitate and maintain interactive discussion and information exchange, clarify the purpose and meaning of messages and feedback, ensure the quality and accuracy of written messages and feedback and detecting typographical and grammatical errors and ability to personalize messages and feedback and making them more lively by adding the appropriate sense of humor when possible and the essential skills expected of a virtual teacher....

Conclusion

The problem of incessant attack on school in northern part of Nigeria and most especially in the north-western region has led to academic disruptions and truncated academic pursuits of many school age youths and children. However, instead of the situation to be abating, the act of terrorism and insurgency is spreading throughout the nation in form of abduction of people including school children, dislocation of villages, bombings among others. This situation has prompted the need to think out of the box to fashion out ways by which academic activities of learners can continue in time where student could not be able to attend physical classes due to insurgency and terrorism activities. Hence, this study which specifically sought responses from agricultural science teachers in secondary schools in Kwara state was carried out to find out the skills that will be required by agricultural science

teachers in time of insurgency. The outcome of the study showed that agricultural science teachers in Kwara state require all the listed Pedagogical, technological, communication and management skills essential for virtual instructions.

Recommendations

Based on the findings of this study, it was recommended that:

- Workshops and improvement programmes be organized for agricultural teachers as well as other teachers on the use of ICT in virtual teaching.
- Frequent and regular training should be done for teachers to update their knowledge on pedagogical skills that are necessary for virtual teaching.
- The curriculum of teacher training programmes at NCE and Degree level should be updated to inculcate all the skills that are essential for virtual teaching in pre-service teachers especially in this era of global unrest and pandemic.
- Teachers should be encourage to improve on their communication skills through regular workshop and seminars to enhance their teaching during virtual or physical classroom instructions.

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