ENRICHING CLASSROOMS WITH TECHNOLOGY: EFFECTIVENESS OF ICT INTEGRATION IN TEACHING AGRICULTURAL SCIENCE IN SENIOR SECONDARY SCHOOLS IN BENUE STATE

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ABSTRACT

Information and Communication Technologies (ICTs) have become part of individual lives in the 21st century. ICT is often employed to improve the quality of instructional delivery to help in equipping the students with relevant skills and knowledge. This paper stressed on the integration of ICT tools in teaching Agricultural Science in Senior Secondary Schools in Benue State. The paper dealt with the impact of ICT tools in teaching Agricultural Science. Examined the usage level of ICT tools by learners, determined the effect of ICT integration on student's attitude/interest and challenges of integrating ICT in Agricultural Science classes. Descriptive survey research design was adopted for the study with the population of 6250 and a sample size of 120 respondents. The instrument for data collection was a questionnaire validated by three experts; data was collected by the researcher and analyzed using mean and standard deviation while chi square was used to test the null hypotheses at .05 level of confidence. Findings revealed amongst others that ICT devises if used in Agricultural Science instruction in teaching learning process, will boost learner's performances, makes learning more interesting and enhances student's retention abilities. Teachers attest that, teacher's incompetency of ICT use, lack of teachers' self-confidence, traditional appraisal of ICT and lack of ICT mainstreaming into schools' policy were some of the constraints faced. Therefore, for effective integration of ICT in teaching Agricultural Science in secondary schools, it was recommended that teachers of Agricultural Science should be trained periodically; sufficient ICT facilities should be provided; there should be constant power supply; internet services should be enhanced, among others.

Introduction

Einstein famously said that his pencil was more intelligent than he was - meaning, that he could achieve far more using his pencil "technology" as an aid to thinking than he could unaided. Don Knezek, the CEO of the International Society for Technology in Education, compares education without technology to the medical profession without technology. "If in 1970 you had knee surgery, you got a huge scar," he says. "Now, if you have knee surgery you have two little dots." This is the wealth of teaching with technology.

Teaching itself is the process of attending to people's needs, experiences and feelings, and intervening so that they learn particular things and go beyond the given (Akitande, 2014). Teaching could be defined as engagement with learners to enable their understanding and application of knowledge and concepts to addressing day to day challenges. In the context of this study teaching Agricultural Sciences with technology means; the making, modification, usage, and knowledge of tools, machines, techniques, crafts, systems, methods of organization, in order to transmit knowledge to learners via ICT tools, solve problem, improve on preexisting solution to a problem, achieve a goal or perform a specific function for learners. It can also refer to the collection of such tools, machinery, modifications, arrangements and procedures for effective teaching pedagogy. In this 21st century, the term "technology" is an important issue in many fields including education. This is because technology has become the knowledge transfer highway in most countries.

Technology integration nowadays has gone through innovations and transformed our societies that has totally changed the way people think, work and live (Grabe, 2007). As part of this, schools and other educational institutions which are supposed to prepare students to live in "a knowledge society" need to consider ICT integration in their curriculum (Amla, 2021).

Information and Communication Technology (ICT) is basically an umbrella term that encompasses all communication technologies such as internet, wireless networks, cell phones, satellite communications, digital television computer and network hardware and software; as well as the equipment and services associated with these technologies, such as videoconferencing, e-mail and blogs etc. that provide access to information. It is an extensional term for information technology (IT) that stresses the role of unified communication and integration of telecommunications and computers, as well as necessary enterprise software, storage and audiovisual system, that enable users to access, store, transmit and manipulate information.

ICT integration is defined by Ghavifekr (2014) as a strategy of integrating information and technology into all facets of education and training, including the administrative function and e-business model required to support learning. According to Lim (2003), Hew and Brush (2007), ICT integration is defined in terms of teachers applying technology to develop learners' thinking skills.

Technology integration is the utilization of technology tools in general content areas in education in order to permit learners to use computer and technology skills to leaning and problem-solving. (Dockstader, 1999). Technology integration is defined as the application of technology to improve the educational environment. Technology integration in the classroom can support classroom instruction through creating opportunities for learners to complete assignments on computer rather than the normal pencil and paper.

Ejiofor, Onu, Bassey, Okechukwu and Nwoke, (2021) in their research work "Integration of ICT Tools in Agricultural Education Curriculum for Quality Instructional Delivery" stated

ICT tools that can be integrated in agricultural curriculum to include

- **E-learning:** E-learning otherwise known as electronic learning can be effectively used for instructional delivery both for distance and close learning. According to Shyamal (2006), the link between distance learning and telecommunications is becoming even stronger, yielding new solutions to old problems, innovative educational resources and new teaching/learning practices. E-learning as learning via electronic media enables the students to learn beyond the walls of the traditional classroom. The benefits of e-learning are that it enables the students to learn any

time, any place, independent learning, and group collaboration among others.

- **Social media:** social media are tools that allow for communal (social) interaction and easy creation of content by users (Ibezim, 2017). Social media are digital technologies that are based on user participation and sharing. Social media can be used for instructional delivery. Some examples of social media that can be used in agriculture instructional deliveries are Facebook, blog, Google Plus among others. The ways social media can be used by teacher for instructional delivery according to Ibezim are:

  i. Post course notices and course related news items in blogs.

  ii. Organize seminars and in class discussion through their blogs.

  iii. Provide records of their own research activity as reference material for students.

  iv. Give opinions on published research in a field of study as a continually updated reading list for the students.

  v. Provide discussions of some related topics linking to topical stories that illustrate real-world implications.

- Computer Assisted Instruction (CAI): CAI makes use of computer directly as a medium of instruction and information delivery system. Egbuna and Opone (2005) maintained that CAI is an instructional design whereby computer system delivers instruction directly to learners by allowing them to interact or relate with designed lessons that have been programmed into the system. Ornstein and Hevine in Egbuna and Opone (2005) highlighted three levels of CAI as:

  i. Practice and Drill Level: This is the simplest and lowest level. It assumes that a concept or skill in agriculture has previously been taught to the learners. This level is then used to perfect and reinforce previously learned concepts, skills or procedures thereby enhancing mastery. This can be an effective tool for teaching practical related courses in Agricultural Science.

  ii. Tutorial Level: At this level, computer essentially acts as the teacher or instructor thereby taking the place of agricultural teacher or instructor. The tutorial level takes over the responsibility for real teaching. Every interaction is between the computer and the learner. The computer present new concepts and principles and once the learner exhibits clear understanding, he immediately goes over to the next activity.

- **Dialogue Level:** This is the highest level and it involves a sophisticated interaction between the learners and the computer. The agricultural learners actually talk to the computer and engage in real dialogue with the computer. The learner can interact or communicate with the machine by giving response and asking new questions.

- **Use of Computer Software/Applications:** Certain computer software have been developed which can be integrated in agricultural curriculum for quality instructional delivery. The functions of the software depend on the type. Some examples of such computer software include: Microsoft Power-point, spreadsheet package (Excel), assessment tools (e.g. flubaroo, Kahoot etc.) Analysis software (e.g. SPSS) among others. For instance, power point can be used for easy presentation of lesson; spreadsheet package- to assist learners in calculations; flubaroo can be used for online assessment of students while SPSS is used for easy analysis of research data.

- **Internet:** Internet is a network that connects millions of computers all over the world through the use of international telecommunications system (Egbuna and Opone 2005). Internet provides most of information or data requested. Ikekeonwu (2003) opines that internet provides world-wide access to resources and information. Internet can serve as a useful tool for teaching and learning. Teachers can update their knowledge and lessons via internet services. Also, students can carry out

their assignments, read ahead of the teachers, up-date their knowledge through the use of internet.

Integration and mastery of these ICT tools and concepts in agricultural curriculum helps teachers to easily access information from internet even in their bedrooms, teach with ease, assess and grade students' performance without much stress as this is also beneficial to students in areas of independent learning, easy access to information, carryout assignments, projects with little stress among others. According to Shyama (2006), ICT opens up opportunities for learning because it enables learners to access, extend, transform and share ideas and information in multi-modal communication styles, and format. Knowing the important roles of ICT in teaching and learning, there is need for proper integration of ICT tools in agricultural curriculum for quality instructional delivery.

For effective integration of ICT in Instructional process, it can be inferred that the factors as teachers' attitude, ICT competence, computer self-efficacy, professional development, teaching experience, education level, technical support, accessibility, leadership support, pressure to use technology, government policy regarding ICT education and technological characteristics positively affect teachers' and administrators' use of ICT in teaching.

ICT in form of multimedia technology affords teachers and students a lot of opportunities for effective teaching-learning outcomes. E-learning is an example of the use of these ICT-supported teaching and learning technique/tool whose use in educational institutions is gaining momentum with the passage of time (Omwenga, 2012). This device, if use in practical agriculture, teaching learning process is expected to boost the learners' performance at public examinations.

Statement of the Problem

Computers and instructional technologies have become ubiquitous in schools. At the same time, national and global reports have criticized the inadequacy of teacher preparation with respect to technology use. While society in general has embraced 21st century technology innovations for daily living, a gap remains in the understanding of appropriate uses for technology in the learning environment by teachers and lerners. . It is the influence of these ICT gadgets on the effectiveness in teaching and learning that has attracted the attention of ICT crusaders, scholars and the researcher to examine wealth of classrooms with ICT integration in teaching Agricultural Science in Secondary Schools in Benue State.

Objectives of the study.

The main purpose of this study is to investigate the effectiveness of ICT integration in teaching Agricultural Science in Senior Secondary Schools in Benue State. But to aid the completion of this study, the researcher seeks to achieve the followings specific objectives;

1. To ascertain the impact of ICT integration in teaching Agricultural Science to Senior Secondary Schools Students in Benue State.
2. To find out the level of ICT usage by students, taught Agricultural Science in Senior Secondary Schools in Benue State.
3. To determine the effect of ICT integration on student attitude and interests toward Agricultural Science in Senior Secondary School in Benue State
4. To find out the constraints faced by teachers in adopting and integrating ICT in teaching Agricultural Science to Senior Secondary School in Benue State.

Research Questions

The following research questions were asked

1. What is the impact of ICT integration in teaching Agricultural Science to Senior Secondary School Students in Benue State?
2. What is the usage level of ICT tools by Agricultural Science Students in Benue State?
3. What is the effect of ICT integration on students' attitude and interests in Agricultural Science in Senior Secondary School in Benue State?
4. What are the constraints faced by teachers in adopting and integrating ICT

in teaching Agricultural Science to Senior Secondary School in Benue State.

Research Hypothesis

The following research hypothesis were tested at 0.05 levels of significance

1. ICT integration has no significant impact on students taught Agricultural Science in Senior Secondary School in Benue State

2. Students' usage of ICT, has no effect on their interests and attitudes towards Agricultural Science in Senior Secondary School in Benue State?

Methodology

This chapter deals with the following: Research design, Area of study, Population, Sample and Sampling techniques, instruments, validation of instruments, reliability of instrument, method of data collection and analysis.

Research Design

The Research design adopted for this study was the descriptive survey research design. It is defined as scientific research that describes about event, phenomena or fact systematically dealing with certain area or population. It is also defined as a research method that describes the characteristics of the population or phenomenon studied. The design is appropriate for this study because it was effective in collecting data from a large number of respondents from all the sampled schools and because no variable of the study was manipulated but studied as they exist.

Area of study

The study was carried out in Makurdi local government area of Benue state. The local government was created in 1976, with 11 council wards these are Ankpa-wadata, Modern market, Fiidi, Bar, Market clarck, Agan, Wailomayo, Central Mission, North Bank one and two and Mbalaah. The local government has three universities which include Joseph Sarwuan Tarkaa University, Makurd, Benue State University, Makurdi, National Open University and 88 governments approved secondary schools with qualified teachers capable of adopting and integrating ICT tools in a class room.

Population of Study

The population of the study was 6250 senior secondary school student and 20 agricultural science teachers in Makurdi LGA, Benue state. The reason for selecting teachers was because they would first adopt and accept the technology before effectively integrating it in the class room. The choice of senior secondary school student was based on the fact that at this level, the students were expected to be well integrated into formal level of thinking. senior secondary schools' student is better placed than any other level to make meaningful impact on the study, also it is believed that students at this level are in better position to be trained for national examination such as West African Examination Council (WAEC), National Examinations Council (NECO) and Joint Admission and Matriculation Board (JAMB), which employ the use of computers for writing.

Sample and Sampling Techniques

The study sampled 100 senior secondary school students, though all 20 Agricultural Science Teachers were used, making a total sample size of 120 respondents. The students were selected using purposive sampling technique and the sampled schools were selected randomly using simple random sampling technique.

Instruments of the Study

The instrument used for data collection was a questionnaire titled: Effectiveness of ICT Integration in Teaching Agricultural Science (EIITAS). The respondents were asked to respond to the items on four points rating scale of Strongly Agree (SA) 4, Agree (A) 3, Disagree (D) 2 and Strongly Disagree (SD) 1. Research questions 1, 2, and 3 were responded to by the sampled students while research question 4 was attended to by the teachers respectively.

Validation of Instrument

The instrument was validated by three experts. They were requested to check for the appropriateness of the items, structures of the question and good reflection of the content and

objective of the research. Their suggestions were useful in modifying the instrument. All the items in the instruments were designed to cover the hypothesis considered for the study.

Reliability of the Instrument

The validated instrument was trial tested to ascertain the reliability of the instrument using Cronbach's Alpha method. The instrument which has 30 items was administered to 16 students from schools that were not part of the sampled area. The data obtained was analyzed using SPSS 20 which yielded an alpha coefficient of 0.75.

Method of Data Collection

The questionnaire was administered by hand to the respondents by the researcher. The researcher afterwards took possession of the questionnaire after completion by respondent for recording and analysis.

Method of Data Analysis

Data was analyzed using mean, standard deviation and chi-square. The mean of 2.50 representing the average value of the four-scale rating was bench mark for decision making to answer the research question. Chi-square was adopted for this study, because the study seeks to elicit responses from the respondent's using frequency or nominal data.

Data Presentation, Analysis, Interpretation and Discussion of Findings

This chapter deals with the presentation, analysis, interpretation and discussion of findings from the data obtained. The data used for this study was obtained by administering questionnaire to senior secondary school students and Agricultural Science Teachers. The results obtained from the data collected and analyzed were presented in tables and the findings discussed.

Data Presentation, Analysis and Interpretation

120 copies of questionnaires were administered to the respondents. The data collected were analyzed based on four research questions and two hypotheses.

Research Question 1

What is the impact of ICT integration in Teaching Agricultural Science to Senior Secondary School Students in Benue State?

Table 1: Data for this research question is presented in table below

S/n	Questions	N	SA	A	D	SD	X	SD	DEC
1	ICT integration in teaching Agricultural Science makes learning of Agricultural Science Interesting and improve students' performance	120	62	37	07	14	3.22	0.99	Agreed
2	ICT enhances students' retention abilities in Agricultural science classes	120	48	46	14	12	3.08	0.96	Agreed
3	ICT make students to be active during Agricultural Science class	120	41	45	16	18	2.90	1.04	Agreed
4	ICT integration in teaching motivates students to learn Agricultural Science	120	45	33	23	19	2.87	1.09	Agreed
5	ICT integration in teaching Agricultural Science makes it simple and understandable.	120	38	36	28	19	2.78	1.05	Agreed

6	ICT integration in teaching Agricultural Science improves teachers teaching skills.	120	33	35	29	24	2.63	1.13	Agreed
7	ICT integration in teaching Agricultural Science makes teaching of Agricultural Science meaningful	120	40	25	32	23	2.78	1.09	Agreed
8	ICT Integration in teaching Agricultural Science reinforces students' self-esteem in classroom	120	33	41	20	26	2.67	1.10	Agreed
9	ICT Integration in teaching Agricultural Science makes students learn quick	120	42	35	13	20	2.78	1.14	Agreed
10	It enhances group learning	120	40	25	32	23	2.78	1.09	Agreed

Foot note: N=sample size, SA= Strongly Agreed, A= Agreed, D = Strongly Disagreed, SD= Strongly Disagreed, $\bar{X}$ = Mean, SD= Standard Deviation

Result in table 1 revealed that teaching agricultural science using ICT tools makes learning of the subject more interesting and improves students' performances, enhances students' retention abilities, makes students to be active and motivated to learn, improves teachers teaching skill and makes teaching meaningful. Respondents also affirmed that teaching with ICT tools reinforces students' self-esteem in the class room, enhances group participation and enable students to understand abstractions better.

Research Question 2

What is the usage level of ICT tools by Agricultural Science Students in Benue State?

Data for research question 2 are presented in table 2

S/n	Questions	N	SA	A	D	SD	X	SD	DEC
1	With ICT, I learn at my own pace	120	20	15	15	70	2.13	1.21	Disagreed
2	I use internet to do my test and home work	120	18	20	14	68	2.14	1.18	Disagreed
3	ICT is linked to my specific needs as a student	120	15	22	9	74	1.71	1.32	Disagreed
4	I hardly feel the absence of a teacher in the class due to internet facilities	120	42	35	13	20	2.78	1.14	Disagreed
5	ICT have taken over the traditional teaching methods	120	21	17	30	52	2.05	1.14	Disagreed
6	Students undertake learning actively and receives feedback	120	30	26	22	42	2.36	1.20	Disagreed
7	It motivates students by bringing varieties of learning materials into the class	120	5	12	35	68	1.61	1.27	Disagreed

8	It allows students for creativity	120	15	17	29	59	1.90	1.09	Disagreed
9	It saves time and energy	120	14	9	34	63	1.78	1.16	Disagreed
10	It sustains student's interest in research.	120	01	08	45	62	1.46	1.32	Disagreed

Foot note: N=sample size, SA= Strongly Agreed, A= Agreed, D = Strongly Disagreed, SD= Strongly Disagreed, $\bar{X}$ = Mean, SD= Standard Deviation

Respondents' responses on research question 2 as reported in table 2 revealed that agricultural science students do not learn at their own pace using ICT tools, they lack internet facilities to do tests and homework, students feel teachers' absence in the class room due to insufficient internet facilities that would have taken over the traditional teaching methods as such, students undertake learning but don't receive feedback on time. Respondents also disagreed that students use ICT tools to access variety of learning materials, these impediments delineate student's self-creativity, and takes more time and energy.

Research Question 3

What is the effect of ICT integration on students' attitude and interests in Agricultural Science in Senior Secondary School in Makurdi Local Government area of Benue State?

Data for research question 3 are presented in table 3 below

Table3: effects of ICT on student's interests and attitudes in Agricultural Science

S/n	Questions	N	SA	A	D	SD	X	Stand.	
1	ICT integration in teaching agricultural science make students to pay careful attention during Agricultural science classes	120	57	29	14	20	3.08	0.99	Agreed
2	Students pay more attention during ICT integrated classes than traditional chalk and board method of teaching	120	64	28	16	12	3.20	0.88	Agreed
3	It makes students to develop interest in agricultural science classes	120	66	32	14	08	3.30	0.77	Agreed
4	It makes students to comprehend difficult agricultural concept easier.	120	61	32	19	08	3.21	0.88	Agreed
5	It makes students appreciates agricultural science	120	71	31	14	04	3.41	0.82	Agreed
6	It makes students to study more and compete for grades.	120	78	29	10	03	3.52	0.74	Agreed
7	It helps to re-shape students' attitude toward the subject	120	47	31	26	16	2.91	1.08	Agreed

8	It makes students to interact and be responsive in the class room	120	52	28	23	17	2.96	1.07	Agreed
9	It makes learning real	120	41	31	26	22	2.75	1.14	Agreed
10	It helps learners to move beyond knowledge and comprehension to application and analysis	120	46	30	26	21	2.79	1.12	Agreed

Foot note: N=sample size, SA= Strongly Agreed, A= Agreed, D = Strongly Disagreed, SD= Strongly Disagreed, $\bar{X}$ = Mean, SD= Standard Deviation

Data on research question 3 as presented in tables 3 revealed that ICT integration in teaching agricultural science makes students to pay careful attention than when traditional and chalk board methods were used; it develops students' interest and helps students to comprehend difficult agricultural concept easier, therefore helps students to develop good attitude towards the subject. It makes for students to interact and be responsive in the class room. Respondents also agreed that ICT integration in teaching agricultural sciences make learning real and make learners to move beyond knowledge base comprehension to application and analysis.

Research Question 4

What are the constraints faced by teachers in adopting and integrating ICT in Teaching Agricultural Science to Senior Secondary School Students in Benue State.

Data for research question 4 are presented in table 4 below

S/n	Questions	N	SA	A	D	SD	X	Stand.D	DEC
1	Poor accessibility to internet	120	42	35	13	20	2.78	1.14	Agreed
2	ICT facilities are very expensive	120	47	31	26	16	2.91	1.08	Agreed
3	Lack of teachers professional and pedagogical training in ICT	120	41	31	26	22	2.75	1.14	Agreed
4	Insufficient power supply	120	40	25	32	23	2.78	1.09	Agreed
5	School location	120	33	41	20	26	2.67	1.10	Agreed
6	Poor school management system make ICT integration difficult	120	48	46	14	12	3.08	0.96	Agreed
7	Teacher lack of self confidence	120	57	29	14	20	3.08	0.99	Agreed
8	Security	120	78	29	10	03	3.52	0.74	Agreed
9	Lack of proper maintenance of ICT facilities	120	66	32	14	08	3.30	0.77	Agreed
10	Government policies regarding ICT	120	64	28	16	12	3.20	0.88	Agreed
11	Absence of instructive programs and software	120	52	28	23	17	2.96	1.08	Agreed
12	Traditional appraisal of ICT	120	66	32	14	08	3.30	0.77	Agreed
13	Funding	120	64	28	16	12	3.20	0.88	Agreed

In order of risk, agricultural science teachers agreed that the following were constraints they face in adopting and integrating ICT in secondary schools; they include, security, lack of proper maintenance and traditional appraisal of ICT with mean scores of 3.52, and 3.30 respectively,

funding took center stage with mean scores of 3.20, poor school management system and teachers lack of self-confidence with mean scores of 3.08, absence of instructional software/programs and cost of facilities 2.96 and 2.91, poor internet accessibility and poor power supply with 2.78 other challenges were lack of teachers professional training and school location were the least problems faced by teachers in their quest to adopting and integrating ICT facilities in the class room with mean score of 2.75 and 2.67 respectively.

Research Hypothesis 1

ICT integration has no significant impact on the Teaching of Agricultural Science in Senior Secondary School in Makurdi Local Government area of Benue State

Table 5: chi-square analysis on the impact of ICT integration in Teaching Agricultural Science

Item	df	x^2	Sig(P-value)
Chi-square	8	40.00	0.00
No. of valid cases		120	

Survey, 2021

Table 5 show x2 calculated of 40.00 and df (degree of freedom) =8. Number of valid cases =120. The sig (p-value) = 0.00 which is less than 0.05 hence the null hypothesis was rejected. This means that, ICT integration has significant impact on the Teaching of Agricultural Science in Senior Secondary School in Makurdi Local government area of Benue State.

Research Hypothesis 2

ICT integration has no Significant effect on Agricultural Science Teachers and Students in Senior Secondary Schools in Makurdi Local Government area of Benue State

Table 6: chi-square analysis on agricultural science teachers and students.

Item	df	x^2	Sig(P-value)
Chi-square	8	28.84	0.00
No. of valid cases		120	

Survey, 2021

Table 6 shows X^2 calculated of 28.84, degree of freedom (df) =8. Number of valid cases = 120. Table 2 shows the sig (p-value) of 0.00 which is less than 0.05. Hence the null hypothesis was rejected. This implies that, ICT integration by Agricultural Science Teachers has significant effect on learners' interest and attitude in Senior Secondary Schools in Benue State.

Discussion of findings

The section deals with the discussion of data analyzed and findings.

The four research questions were answered based on the data obtained by the researcher by administering the questionnaires to both students and teachers.

The study revealed that teaching agricultural science using ICT tools makes learning of the subject more interesting and improves students performances, enhances students retention abilities, makes students to be active and motivated to learn, improves teachers teaching skill and makes teaching meaningful. Respondents also affirmed that teaching with ICT tools reinforces students' self-esteem in the class room, enhances group participation and enable students to understand abstractions better. This findings collaborates the findings of Omwenga, (2012), who stated that ICT devices if use in agricultural science instruction in the teaching learning process is expected to boost the learners' performance at public examinations. The study also conforms the findings of Slaouti and Barton (2008) who stated that Learners can undertake learning actively and receive desired feedback; which means that ICT can motivate students in their learning by brining variety into the lessons, and at the same time, sustaining teachers' own interest in teaching.

According to Egunjobi (2015), the benefits of ICT-facilities to teachers in agricultural science instruction were also numerous and they include: Allows for **Creativity**: The teacher has access to several methods he/she can use to pass instruction to his/her learners. He/she chooses the one he/she deems best to teach after weighting the entry point of the students. **Saves time**: In as much as the learners have access to the lesson even in the absent of the teacher, the teacher therefore have more time to concentrate on the all-important task of solving more difficulty topics. Ineffective learning activities are replaced: Both the teacher and learners have no reason for irrelevancies occasioned by the face-to-face and chalk-talk method. Hence there is ample time for quality and effective lesson.

The findings reported in table 2 revealed that agricultural science students do not learn at their own pace using ICT tools, they lack internet facilities to do tests and homework, students feel teachers absence in the class room due to insufficient internet facilities that would have taken over the traditional teaching methods as such, students undertake learning but don't receives feedback on time. Respondents also disagreed that students use ICT tools to access variety of learning materials, these impediments delineate student's self-creativity, and takes more time and energy. The findings of the present study agrees with Onu and Ezhim (2019) which examined the availability, functionality and utilization of ICT facilities for effective instructional delivery of Agricultural Science in Nigeria Secondary Schools. The authors submitted that most ICT facilities were not available, and the few available were not utilized because of non-functionality in most secondary schools in the study area. The study concluded that there was need for a refocus on ICT integration in the education system, which is a common trend in the present study.

Data on research question 3 as presented in tables 3 revealed that ICT integration in teaching agricultural science makes students to pay careful attention than when traditional and chalk board methods were used; it develops students interest and helps students to comprehend difficult agricultural concept easier, therefore helps students to develop good attitude towards the subject. It makes for students to interact and be responsive in the class room. Respondents also agreed that ICT integration in teaching agricultural sciences make learning real and make learners to move beyond knowledge base comprehension to application and analysis.

These findings supported the work of Dockstader (1999), who stated that through integrating technology, more depth into the content-area syllabus would be possible. In the information age, there is an urgent need to learn technology; Learners are motivated through technology that ultimately enhances academic engagement time. Working in more depth with the content, learners can move beyond knowledge and comprehension to application and analysis of information. Learners learn

where to find information in an information rich world. Learners develop computer literacy through using different computer skills as part of the learning process.

The research findings also collaborates Oliver, Osa, and Walker (2012), whose report showed that ICT integration helps learners become capable information technology users, information seekers, analyzers, evaluators, problem solvers, decision makers, creative users of technology tools, communicators and collaborators.

In order of risk, agricultural science teachers agreed that the following were constraints they face in adopting and integrating ICT in secondary schools; they include, security, lack of proper maintenance and traditional appraisal of ICT, funding, poor school management system and teachers lack of self-confidence, absence of instructional software/programs and cost of facilities, others included poor internet accessibility and poor power supply, lack of teachers professional training and school location were the least problems faced by teachers in their quest to adopting and integrating ICT facilities in the class room. These findings are in agreement with the work of Andoh (2012) who conducted a study to review literature regarding factor influencing integration of ICT and found three level factors: (a) Teacher-level (b)School-level and (c) System-level. **Teacher level** hindrances comprise teacher incompetency of ICT use, lack of teacher self-confidence, lack of teacher professional and pedagogical training, and lack of differentiated training programs. **School-level** hindrances include lack of specially designed infrastructure for ICT use, old or effective maintenance of equipment, absence of appropriate instructive programming and software, poor accessibility to ICT, poor project related understanding and lack of ICT mainstreaming into school's policy. **System-level** hindrances embrace unbending structure of conventional education system, traditional appraisal, obstructive curricula and limited organizational structure. Effects of Information and Communication Technology (ICT), the degree to which these hindrances influence people and organizations may help in deciding how to handle them.

The two hypotheses were tested and it was found that, ICT integration had significant impact on Teaching Agricultural Science in Senior Secondary School in Makurdi Local Government area of Benue State. This is in agreement with Onu and Ezhim (2019) who found that ICT integration had significant influence in teaching and learning of science. Again it was found that, there is significant relationship with student's interests and attitudes in Agricultural Science in Senior Secondary Schools in Makurdi Local Government area of Benue State. This is in agreement with Enoch (2021) study, who posits that, Adopting ICT integration in teaching will influence student's interests and attitudes toward learning.

Conclusion, Findings and Recommendations

This chapter deals with the following: summary of findings, conclusion, and recommendations. The study was carried out using Senior Secondary School Students within Makurdi Local Government Area of Benue state.

Summary of Findings

ICT integration impact the Teaching of Agricultural Science in Senior Secondary Schools within Makurdi Local Government area of Benue State (see table 1)

It was found that ICT devises if used in Agricultural Science instruction in teaching learning process, will boost learner's performances, makes learning more interesting and enhances student's retention abilities.

Findings revealed that ICT facilities were not available in schools and the few available were not utilized because of non-functionality, power and poor internet services amongst others.

Findings revealed that learner's interest and attitude toward Agricultural Sciences was enhanced whenever ICT tools were used in teaching because more depth into the content syllabus was achieved.

Two research hypotheses were tested at 0.05 level of significant and it was found that;

ICT integration had significant impact on student's interest and attitude toward Agricultural Science in Senior Secondary School in Benue State.

Conclusion

It was concluded in this study that the use of ICT tools impacts the teaching of Agricultural Science and boost students interest and attitudes towards agricultural sciences compared to conventional/ traditional teaching method therefore, for effective integration of ICT in Instructional process, it was inferred that the factors such as teachers' attitude, ICT competence, computer self-efficacy, professional development, teaching experience, education level and technical support should be assessed as a tool for performing meaningful projects to engage learners in critical thinking and problem solving.

Recommendations

To effectively integrate ICT tools in Teaching Agricultural Sciences for quality instructional delivery, the study recommends the following:

1. Curriculum planners and developers should integrate ICT tools into Agricultural Science curriculum. They can be included as part of instructional materials for quality teaching.

2. The school administration through the help of the government should provide sufficient computers and other ICT tools necessary for teaching and learning.

3. The school management should provide strong and constant internet services in the school. This will enable easy access to internet at any given time.

4. Agricultural Science Teachers and instructors should be constantly trained on the usage of new ICT tools which they can employ in instructional delivery.

5. There should be an establishment of an effective ICT unit and support structure which will act as a catalyst for the integration of ICT tools in the teaching learning process.

6. Schools should adopt online assessment tools in assessing students' performance. This will enable the students embrace ICT usage knowing that they will write online test.

7. Constant power supply is highly necessary for the integration of ICT in instructional delivery in schools.

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