

COMMUNICATING AGRO-BASED KNOWLEDGE INFORMATION THROUGH THE NEW MEDIA TOOLS AMONGST SECONDARY SCHOOL TEACHERS IN MINNA, NIGER STATE

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ABSTRACT

This study has investigated the utilization of ICT tools in delivery of agricultural science information amongst secondary school teachers in Minna, Niger state. The instrument employed for the study was a survey questionnaire which was administered to a stratified random sample of 250 agricultural science teachers from 34 secondary schools in Minna, Niger State, Nigeria. The response rate was 100%. Overall findings from the study revealed that despite numerous benefits of ICT tools in teaching and learning process, secondary schools in Minna, Niger State are yet to embrace the use of ICT technology in teaching agricultural science subjects, while lack of ICT tools availability was implicated as reason for non-usage. However, some of the respondents who own personal ICT tools, such as, computers, digital camera, smart-phones mostly use them for entertainment and social network purposes rather than teaching. This study concludes that teachers' confidence and familiarity with ICT tools were very high; however, issue of accessibility and availability to these tools must be tackled by the school authority with the support of the federal government to improve the situation. Finally, this study recommends that the school authority should realise the importance of these tools and make them available in schools where they can be useful for teaching and learning agricultural science and all myriad of other subjects in secondary schools. KEYWORDS: New media, agriculture, agricultural science, ICT tools, teaching

INTRODUCTION

Information and Communication Technology (ICT) since inception has offered access to unlimited, numerous and wide range of information in all fields of work and learning using its basic tools, and agriculture is not left out. ICT have always mattered in the practice of teaching and learning of agriculture across the world. Planting of crops and rearing of animals has encouraged farmers to seek for information on how to improve and expand their farming business. Likewise, ICT has helped in effective teaching and learning of agricultural science by making available information relevant to the subject without necessarily going into cultivation of plants and rearing of animals (Mcnamara, Belden, Kelly, Pehu and Donovan, 2011).

Therefore, when thinking about how ICT enhances teaching and learning, the idea is to make the most purposeful use of the available ICT resources and tools across all teaching and learning.

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Information and Communication Technologies (ICT) can be defined as a diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information (Mishra, Sharma and Tripathi, 2011).

According to Hennessy, Onguko, Harrison, Ang'ondi, Namalefe, Naseem, and Wamakote (2010), ICT is a platform which involves communication devices and applications such as radio, television, cellular phones, computer and network hardware and software, as well as the various services associated with them.

There are many ICT tools that are useful for education. Since technology is always advancing, students can utilize such tools to improve themselves, while teachers deliver their lessons in a fun and friendly manner. ICT tools include but not limited to Internet, Blog, Online Forum, E-books, Interactive Whiteboard, Computer, Projector, Presentation softwares, Educational Games, Mobile/Smart phones, Telephony, Broadcasting technologies (radio and television), Digital Camera, Text chat, Voice/Video chat, Online quizzes and games (British Council 2013).

According to Partnership Development Schools (PDS) Strategy (2009), students' ability to apply the available ICT tools and their ICT capability across the curriculum is largely dependent on the effective teaching and learning of ICT in the first place. That is, students' use of ICT in every subject may be ineffective if they do not already have an appropriate level and understanding of ICT capabilities. This is essential so as not to result in a lack of progress in both ICT and the subject area. For example, producing a presentation in a subject will be relatively impossible and unproductive if there is little or no experience of using the software or understanding how to create meaning and impact for a particular audience. Trying to learn new areas of ICT at the same time of working on a project or subject content will often result to failure. ICT capabilities involve primarily with having the technical know-how to access appropriately, use, develop, create and communicate information using technological tools. This is demonstrated by purposefully applying technology to solve problems, analyse and exchange information, develop ideas, create models and control devices. In creating a presentation for example, ICT capabilities involves the selection of appropriate software, consideration of fitness for purpose and matching content and style to a given audience.

The various uses of ICT may involve little or no use of ICT by students, however, may do little to apply and develop their ICT capability. The use of ICT as a medium of teaching can enhance and stimulate the learning experience of students and contribute to the achievement of the subject's objectives and as students become more confident and proficient in using ICT, higher ICT capabilities in subjects can be developed and applied by producing web pages for a given purpose and audience.

manipulating data to prove in the subject and so on. It is therefore important to recognise the different contributions that ICT can make to teaching and learning and to acknowledge the importance of each. It is also essential to note and be reminded that lessons are not software or technology driven but focused on clear teaching and learning objectives where ICT is used as the vehicle to support achievement of those objectives - Partnership Development Schools Strategy (2009).

The utilization of ICT tools in teaching and learning Agricultural Science in secondary schools can virtually be distinguished from other subjects like Biology, Computer Science, Chemistry, Physics, English, Mathematics, and so on. However, the approach and usage of these tools can be slightly different from other subjects - Lee (2012).

STATEMENT OF PROBLEM

The advent and rapid development in ICT has revolutionised the lives of global communities in all ways, reaching to all sectors in the society particularly in education. Its usefulness has since manifested greatly in the academic circles, which enabled students and teachers use the platform for teaching and learning in all fields of learning and career. According to Ojala (2009), the basic ICT infrastructure is good in most if not all countries with continuous and steady rise of computers and softwares. However, ICT tools are not popular or not commonly used among teachers. If they are used, they are used mainly during free time and not for teaching purposes. He further stated that the schools' resources and possibilities to further develop things are limited and always depend on the willingness and possibilities of governments and local school authorities to support these development initiatives.

Therefore, despite the wide use and acceptance of these ICT tools, educational institutions (secondary schools especially) are yet to embrace this idea or have not used it the right way they should as it has not been used in all subjects taught in their schools. As compared to developed countries, developing countries are still far behind utilizing these tools for educational purpose.

With these tools and technologies relatively available and accessed everywhere, has it been used in teaching agricultural science students in secondary schools? Are the ICT tools available for students' use? Do secondary school teachers know the importance of these tools? Can secondary schools in Minna afford the cost of purchasing these tools? Have they been able to maintain the tools they have? Therefore, the study investigates the utilization of ICT tools in teaching and learning of agricultural science with focus on secondary school students in Minna, Niger State.

The aim of the study is to establish on the effectiveness of ICT tools usage in teaching and learning of agricultural science in secondary schools in Nigeria; the tools used in teaching by teachers and also the tools used by students in learning either in the

school environment (class) or outside the school environment (home).

This study also aimed at asserting the extent to which ICT tools are used in teaching and learning and probes the challenges that are involved in using the tools. The study also intends to discover the level of access and usage that students and teachers have put ICT tools.

OBJECTIVE OF THE STUDY

1. To delineate the confidence level of a teacher in using ICT tools.
2. To investigate the level of access that teachers have to ICT tools.
3. To define the purpose for which teachers use ICT tools.
4. To determine the extent ICT tools has been used in teaching and learning of agricultural science.
5. To describe the relationships that exists between students' use of ICT tools and their academic performance.

RESEARCH QUESTIONS

1. What is the confidence level of a teacher to the usage of ICT tools in teaching and learning of agricultural science?
2. What is the level of teachers' accessibility to ICT tools in teaching and learning of agricultural science?
3. What is the best purpose for which teachers can use ICT tools?
4. What is the extent to which ICT tools has been used in teaching and learning?
5. To what extent does the use of ICT tools contributes to students' academic performance in agricultural science?

LITERATURE REVIEW

ICT in education for teaching and learning

Over the past two decades, Information Technology (IT) has broadened to become Information and Communication Technology (ICT), and has become better established within schools . During the past few years, the world has witnessed a phenomenal growth in communication technology, computer networking and information technology. Development of new broadband communication services and convergence of telecommunication with computers have created numerous possibilities to use a variety of new technology tools for teaching and learning procedure - Shyamal, (2006).

ICT tools which includes Internet, Blog, Online Forum, E-books, Interactive Whiteboard, Computer, Projector, Presentation softwares, Educational Games,

Mobile/Smart phones, Telephony, Broadcasting technologies (radio and television), Digital Camera, Text chat, Voice/Video chat, Online quizzes and games has evolved rapidly in all aspects and sectors of our society today from Art, Banking, Entertainment, Education, Business, Industries, Journalism, Medicine, Engineering and so on. In the education sector, ICT tools have been imbibed into all subjects and fields of learning including agricultural science. Ojala (2009) highlights three basic points in support of ICT. These points are:

1. The basic ICT infrastructure is good in all partner countries and that the amount of computers and software is also rising continuously.
2. The schools' resources and possibilities to further develop things are limited and always depend on the willingness and possibilities of governments and local school authorities to support these development initiatives.
3. Social communication tools are not popular, or at least not commonly used, among teachers. If they are used, they are used mainly during free time and not for teaching purposes”.

The integration of computers and other communication devices and tools offer unprecedented opportunities to the education systems with its capacity to integrate and interact with each other over a wide geographic distance in a meaningful way to achieve the learning objectives. The advancement and growth of ICT tools has contributed to the wide range of access to information by both teachers and students in a world beyond the classroom. Teachers has employed these tools in seeking and passing knowledge to their students while students on the other hand has received these tools as a medium of learning in the classroom and even on individual learning while studying.

ICT supported teaching and learning is well known for its interactivity, flexibility and convenience and has therefore become the order of the day. It is also important to know that regardless of the age or class of students, ICT tools interacts with all learners in passing knowledge to the individual and has also helped teachers and learners to communicate and collaborate without boundaries.

Shyamal (2006) explains that ICT enabled learning has impacted education across the globe through the enablement of new patterns and approach in educational practices of teaching and learning. The present day learning has benefitted a lot through projects and problems, inquiry and design, discovery and invention, creativity and diversity, action and reflection. This learning transition from the conventional learning approach to ICT enabled learning has allowed learners-focus paradigm instead of the regular and common teacher-centred paradigm. The model and pattern has changed from traditional instruction to virtual learning environment with technologies in place.

Unlike in advanced societies, utilization of ICT tools is still at its infant phases in Africa and other developing countries like Nigeria. Okoye (2000) corroborates this as saying; it is still considered an achievement owing a computer (most common ICT tool) in Nigeria whereas students in the United States are exposed and uses the computer in doing their homework and send it to their lecturers via E-mail.

Generally, ICT tools help to open up opportunities for learning by enabling four major key processes in transforming teaching and learning - Shyamal (2006). The processes are: Firstly, access ideas and information from diverse sources through searching, locating, selecting, and authenticating material in a wide range of multimedia forms. Secondly, extend ideas and information through processing, manipulating, analyzing & publishing material in different multimedia forms. Thirdly, transform ideas and information into new or different forms through synthesizing, modelling, simulating and creating material in many multimedia styles and formats and lastly, share ideas and information across local, national and international networks by interacting electronically with others in actual and/or delayed time.

Use of ICT Tools in Agriculture

Agriculture is best known to be one of the key sectors of a country's economy and a very important factor for rural development. Just like in other fields and careers of learning, ICT cannot be over emphasized or under rated in agriculture. The use and importance of ICT in agriculture is so numerous and enormous. Information and communication technologies (ICT) can be used to advance agriculture by seeking to increase sustainable productivity, strengthen farmers' resilience, reduce agriculture's greenhouse gas emissions and increase carbon sequestration, while it strengthens food security and delivers environmental benefits - World Bank (2011). Mcnamara, Belden, Kelly, Pehu, and Donovan (2011) affirm that information has always been used and played a very important role in communication between farmers by sending messages to themselves on how to improve on their crop cultivation and rearing of animals. As a result of the growth in market, one of the most significant importance of ICT in agriculture is boundary eradication that allows showcasing farm products which are appreciated and purchased via the internet. The internet serves as a platform to showcase and display agricultural products and has therefore given room for exportation from one country to another through purchase which means farm products are not limited for consumption in the local community where they are planted and cultivated only.

On the other hand, ICT has been seen and utilized in agriculture for sending and receiving information among farmers on new developments and changes in the agriculture sector through various means, methods and platforms. For example,

farmers in a village may have planted the same crop for centuries, but over time, weather patterns and soil conditions change and epidemics of pests and diseases come and go, therefore, updated information about these changes allow farmers to cope with and even benefit from these changes. Notable and most common means of sending and receiving information includes radio, television and cellular/mobile phones - eLAC2015, (2012).

The radio continues to be the most common ICT in rural communities and developing countries. Radio, before the advent of the computer and internet has served and still serving most farming communities in gathering and receiving information. This ICT tool allows and enables sending information to farmers on where to get fertilizers in their community, how to improve their farming business, market demand of commodities, how, where and when to sell their products and so on. Just like the adage 'Action speaks louder than voice', television has been a very impactful means of passing information and knowledge to farmers because it involves both audio (sound) and video which helps to facilitate high speed in understanding and adoption of a new innovation and approach in the agricultural sector. Television just like radio is used to pass information and educate farmers but with the advantage of visibility. Cell-phone use on the other hand creates new possibilities for connection in rural households and agricultural businesses. Just like in our daily conversation with people, use of cell-phone as an ICT tool in agriculture has helped in gathering information from fellow farmers or knowledgeable and resource persons by simply dialling the person's phone number or exchanging text messages in a way of sending and receiving information from one another. The internet is the most powerful and resourceful information source in all areas and fields of life. Agriculture sector is not left out of this development as most mechanized and large scale farming business now depends solely on the internet for information on new and latest development in the sector, how to improve their business and provide large improvements in production management - infoDev, (2013).

THEORETICAL FRAMEWORK

Theories are set of statements asserting relationships among classes of variables - Bower & Courtright, (1984). Theories are further defined as systematic and logical statement of how phenomena are related to one another and also defined as stories about how and why events occur.

Therefore this research work will be grossly incomplete without a befitting theoretical framework which will form the foundation on which the various literatures gathered and analysed in this work would rest on. It is therefore pegged on the Diffusion of Innovations.

Diffusion of Innovations is one of the oldest social science theories. The book Diffusion of Innovations was written by a professor of communication studies,

Everett M. Rogers. The book was first published in 1962, reviewed in 1971, 1983, 1995, and now in its fifth edition (2003). The main motivation for writing the book on the topic 'Diffusion of Innovations' was to point out the lack of diffusion of diffusion-research, and to argue for greater awareness among the diffusion research traditions - Rogers, (1983). Everett Rogers opined that diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Also, as a special type of communication, in that the messages are concerned with new ideas - Rogers, (1983).

The theory seeks to explain how innovations are taken up in a population. An innovation is an idea, behaviour, or object that is perceived as new by its audience. Research on the Diffusion of Innovations started in a series of independent intellectual enclaves during its first several decades. Each of these disciplinary cliques of diffusion researchers studied one kind of innovation. Rural sociologists investigated the diffusion of agricultural innovations to farmers while educational researchers studied the spread of new teaching ideas among school personnel - Robinson (2009).

From the definition of diffusion by Everett Rogers, four main elements were established; they are Innovation, Communication channels, Time and Social system. Innovation is defined as an idea, practice, or object that is perceived as new by an individual or other unit of adoption. A communication channel is the means by which messages get from one individual to another. Time is an important element in the diffusion process. It is an obvious aspect of any communication process, but most (non-diffusion) communication research does not deal with it explicitly. A social system is defined as a set of interrelated units that are engaged in joint problem solving to accomplish a common goal. The members or units of a social system may be individuals, informal groups, organizations, and/or subsystems - Rogers (1983). Diffusion of Innovations offers three valuable insights into the process of social change. The insights are; the qualities that make an innovation spread, the importance of peer-peer conversations and peer networks, and the understanding the needs of different user segments - Robinson (2009).

Robinson (2009) in his book *A Summary of Diffusion of Innovation* explains that the diffusion of innovations theory involves an entirely different approach compared to other theories of change. Rather than persuading people to change, diffusion of innovation sees change as a new evolution or improvement on existing products which meet individuals' and groups' needs. In *Diffusion of Innovations* people do not change, rather the innovations themselves changes.

The Diffusion of Innovations established five basic adopter categories, although majority of the general population tends to fall in the middle categories, it is still

necessary to understand the characteristics of the target population - Boston University School of Public Health (2013). There are various strategies used for promoting an innovation, they are classified into the different adopter categories.

First are Innovators, these are people who usually want to be the first to try the innovation. They are venturesome and interested in new ideas. These people are very willing to take risks, and are often the first to develop new ideas. Very little, if anything, needs to be done to appeal to this population. They make up 2.5% of the adopters' category.

Second category are the Early Adopters, they are people who represent opinion leaders. They enjoy leadership roles, and embrace change opportunities. They are already aware of the need to change and so are very comfortable adopting new ideas. Strategies to appeal to this population include how-to manuals and information sheets on implementation. They do not need information to convince them to change. The Early adopters make up 13.5% of the adopters' category.

The third category is the Early Majority; they are rarely leaders, but they do adopt new ideas before the average person. That said, they typically need to see evidence that the innovation works before they are willing to adopt it. Strategies to appeal to this population include success stories and evidence of the innovation's effectiveness. 34% of the adopters' category is the Early Majority.

The Late Majority are the fourth category, these people are sceptical of change, and will only adopt an innovation after it has been tried by the majority. Strategies to appeal to this population include information on how many other people have tried the innovation and have adopted it successfully. Late Majority like the Early Majority make up 34% of the adopters' category.

Lastly, the Laggards are the fifth category, these people are bound by tradition and very conservative. They are very sceptical of change and are the hardest group to bring on board. Strategies to appeal to this population include statistics, fear appeals, and pressure from people in the other adopter groups. The Laggards make up 16% of the adopters' category.

Everett Rogers established five main factors that influence adoption of an innovation, and each of the factors is at play to a different extent in the five adopter categories. The factors are Relative Advantage, Compatibility, Complexity, Trial ability, and Observable results - Rogers 1983).

The theory is related to the study noting the fact that ICT tools have been effective instruments for promoting education in any country. However, it still depends on how the innovation (ICT tools) is perceived, integrated and implemented. In developed countries for example, teaching and learning in schools fall under either

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the first and second (Innovators and Early Adopters) category of Everett Rogers' adopters' category. These people are venturesome and interested in new ideas. They are already aware of the need to change and so are very comfortable adopting new ideas. In developing countries however, teaching and learning in schools fall under the Early Majority where they typically need to see evidence that the innovation worked before they are willing to adopt it. Majority therefore fall under the Late Majority category in the adopters' categories. They are people who are sceptical of change, and will only adopt an innovation after it has been tried by the majority. In teaching and learning of agricultural science in secondary schools in Minna Niger state, teachers and students still fall under the Early Majority and Late Majority in Everett Rogers' adopters' categories.

It is importance to note however that no category is more important than the other, as there are positive and negative sides to each category.

METHOD

The research design for this study is survey. The survey design is a method where a group of people is studied by collecting information from them. Questionnaires were administered personally in the course of data gathering for this study. The questionnaires were administered to students in their schools during leisure (break) period in order to ensure error free and good understanding of the questionnaire.

The population of the study is 34 secondary schools in Minna, Niger State. There are 250 agricultural science teachers in these secondary schools - Niger State Ministry of Education, (2014). Therefore, the samples of the study were basically agricultural science teachers in 34 secondary schools in Minna, Niger state, Nigeria.

A sample of 250 secondary school teachers was used for this study and they were selected through a stratified random sampling technique. From all the 34 schools, 7 teachers were selected per school. The sample was divided into 2 strata based on gender: males and females and class being taught: Junior Secondary School (JSS) and Senior Secondary School (SSS).

FINDINGS AND DISCUSSION

The 250 questionnaires that was distributed were retrieved which represents 100% response rate of the correspondents. Information collected is therefore represented in tables below:

The demographics of respondents indicates that 103(41.2%) and 147(58.8%) were male and female respectively. A total of 126(50.4%) of the respondents teach in Junior Secondary Schools (JSS), while 92(36.8%) teach in Senior Secondary Schools (SSS) and 32(12.8%) teach both JSS and SSS. Respondents those who own a personal computer accounts are 102(40.8%) while those who do not are 148(59.2%). The Table also shows that 69(27.6%) respondents have reading as their hobby while

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33(13.2%), 102(40.8%) and 46(18.4%) have watching football, teaching and travelling as their hobbies respectively.

Table 1: Percentage distribution of the respondents on their familiarity with ICT tools:

Available ICT tools	Frequency	Percentage
Computer	250	100
Internet	250	100
Smart-phones	226	90.4
Tablets	198	79.2
Digital camera	224	89.6
Educational games	113	45.2
Projector	129	51.6
Blogs	104	41.6
Presentation software	117	46.8
Others	-	-

Familiarity with computer and internet account for 100% from all 250 respondents:

Smart-phones account for 90.4% from 226 respondents while Tablets, Digital camera, Educational games, Projector, Blogs, Presentation softwares account for 198 (79.2%), 224 (89.6%), 113 (45.2%), 129 (51.6%), 104 (41.6%) and 117 (46.8%) respectively. No other ICT tool was added in the "Others" which accounts for 0%.

Table 2: Percentage distribution of the respondents on their usage frequency of the above tools:

Usage	Frequency	Percentage
Hardly ever	13	5.2
Occasionally	74	29.6
Sometimes	102	40.8
Frequently	35	14
Almost always	26	10.4
Total	250	100

From Table 2 (above), 5.2% (13 respondents) picked "Hardly ever" in the usage frequency table while 29.6% (74 respondents), 40.8% (102 respondents), 14% (35 respondents) and 10.4% (26 respondents) picked "Occasionally", "Sometimes", "Frequently" and "Almost always" respectively.

Research Question One: What is the confidence level of a teacher to the usage of ICT tools in teaching and learning of agricultural science?

Table 3: Mean score response of teachers on their confidence level on using ICT tools:

Item	Mean score (\bar{x})	Remarks
Confidence to use ICT tools for teaching	3.6	Accept
Talk about the use of ICT tools in teaching	2.6	Accept
Readiness to use ICT tools for teaching	4.4	Accept
Resources to use ICT tools in teaching	2.3	Reject
ICT tools usage will enhance interactions among students	4.7	Accept

Average Mean Score = 3.6

Cut off mean = 2.5

Table 3 (above) shows the respondents' confidence level of ICT tools and the calculated mean on "Confidence to use ICT tools for teaching" is 3.8, "Talk about the use of ICT tools in teaching" is 2.6, "Readiness to use ICT tools for teaching" is 4.4, "Resources to use ICT tools in teaching" is 2.3 and "ICT tools usage will enhance interactions among students" is 4.7. Whereby the average mean score is calculated as 3.6. "Resources to use ICT tools in teaching" was rejected because it has below the minimum mean score of 2.5 while others are accepted.

Research Question Two: What is the level of teachers' accessibility to ICT tools in teaching and learning of agricultural science?

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Table 4: Mean score response of teachers on their place of access of ICT tools:

Item	Mean score (x)	Remarks
School	2.2	Reject
Home	2.8	Accept
Cyber café	4.5	Accept
Public libraries	1.9	Reject
Friend/Colleagues' house	2.6	Accept

Average Mean Score = 2.8

Cut off mean = 2.5

Table 4 (above) illustrates the places of access of ICT tools and the calculated mean for each of "School", "Home", "Cyber café", "Public libraries" and "Friend/Colleagues' house" are 2.2, 2.8, 4.5, 1.9 and 2.6 respectively. The average mean score for this table is calculated to be 2.8. Both "School" and "Public libraries" were rejected because both have below the minimum mean score of 2.5 while others are accepted.

Research Question Three: What is the best purpose for which teachers can use ICT tools?

Table 5: Mean score response of teachers on their purpose of usage of ICT tools:

Item	Mean score (x)	Remarks
Personal academic activities	2.4	Reject
Social network	3.9	Accept
Entertainment	5.7	Accept
Sport	2.4	Reject
Teaching	1.8	Reject

Average Mean Score = 3.2

Cut off mean = 2.5

Table 5 (above) shows the purpose of usage of ICT tools where "Personal academic activities" has a calculated mean of 2.4 while "Social network", "Entertainment", "Sport" and "Teaching" has calculated mean of 3.9, 5.7, 2.4 and 1.8 respectively. Both "Social network" and "Entertainment" were accepted because they have above the minimum mean score of 2.5 while others were rejected.

Research Question Four: What is the extent to which ICT tools has been used in teaching and learning?

Table 6: Mean score response of teachers on teaching and learning using ICT tools:

Item	Mean score (x)	Remarks
Helped my teaching of agricultural science	2.2	Reject
Makes teaching agricultural science easy	4.1	Accept
Will improve my teaching of agricultural science	3.9	Accept
Have facilitated fast learning for agricultural science students	2.4	Reject
Encouraged to teaching agricultural science	2.0	Reject

Average Mean Score = 2.9

Cut off mean = 2.5

From table 6 (above), it explains the calculated mean regarding teaching and learning using ICT tools. "Helped my teaching of agricultural science" has a calculated mean of 2.3, "Makes teaching agricultural science easy" has a mean of 4.1, "Will improve my teaching of agricultural science" has a mean of 3.9, "Have facilitated fast learning for agricultural science students" has a mean of 2.4 and "Encouraged to teaching agricultural science" has a mean of 2.0. Therefore, "Makes teaching agricultural science easy" and "Will improve my teaching of agricultural science is accepted while others were rejected because their calculated mean is below the minimum mean score of 2.5.

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DISCUSSION

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Research Question Five: To what extent does the use of ICT tools contributes to students' academic performance in agricultural science?

Table 7: Mean score response of teachers on academic performance while using ICT tools:

Item	Mean score (\bar{x})	Remarks
Students have used ICT tools to study and pass examinations	2.4	Reject
Contributed to students' academic performance	2.3	Reject
Contributed to personal academic work performance	2.6	Accept
Students' performance has risen from average to excellence	2.0	Reject
Made teaching more effective	2.0	Reject

Average Mean Score = 2.3

Cut off mean = 2.5

Table 7 (above) shows the academic performance using ICT tools where "Students have used ICT tools to study and pass examinations", "Contributed to students' academic performance", "Contributed to personal academic work performance", "Students' performance has risen from average to excellence", "Made teaching more effective" have a calculated mean of 2.4, 2.3, 2.6, 2.0 and 2.0 respectively. Only "Contributed to personal academic work performance" was accepted while others are rejected.

DISCUSSION

The study was exposed to some information and therefore the gathered information is discussed for clarity and understanding.

Table 1 illustrates the percentage distribution of the respondents on their familiarity with ICT tools. 9 ICT tools were listed among which "Computer" and "Internet" has 100% familiarity amounting to total familiarity level by the 250 respondents (teachers). "Smartphone" is the next highest percentage to computer and internet with 90.4% from 226 teachers that are familiar with it. "Digital camera" is next to smartphone with teachers' population of 224 making 89.6% who are familiar with ICT tools. 198 respondents picked "Tablets" which accounts for 79.2% of the total population. "Projector" is another familiar ICT tools to respondents with 51.6% from 129 respondents of the total population. Other listed ICT tools below average are "Presentation software", "Educational games" and "Blogs" at 46.8% (117 respondents), 45.2% (113 respondents), and 41.6% (104 respondents) respectively. No "other" ICT tools were added by respondents which account for 0%.

From the findings above, it was established that respondents (teachers) are familiar with ICT tools particularly Computer and Internet with 100% familiarity. Other tools that they are familiar with are Smart-phones, Digital camera, Tablets and Projector which has a percentage above average.

Percentage distribution of the respondents on their usage frequency of the listed ICT tools in Table 2 is shown in table 3. 102 respondents (40.8%) of the population uses ICT tools "Sometimes" while 74 (29.6%) uses it "Occasionally". 35 respondents (14%), 26 respondents (10.4%) and 13 respondents (5.2%) of the population uses ICT tools "Frequently", "Almost always" and "Hardly ever" respectively.

From the findings therefore, we can say the usage of ICT tools is not very frequent as a larger percentage of respondents uses it sometimes and occasionally. Only few respondents use it frequently and almost always. Okoye (2000) corroborates this saying it is still considered an achievement owing a computer (most common ICT tool) in Nigeria whereas students in the United States are exposed and use the computer in doing their homework and send it to their lecturers via E-mail.

Table 3 considered the mean score response of teachers on their confidence level of ICT tools and it was found and established that only "Resources to use ICT tools in teaching" which has a mean of 2.3 was rejected because it has less than the minimum mean of 2.5 while other items dealing with confidence to ICT tools was accepted. The "Confidence to use ICT tools for teaching" has a mean of 3.8, "Ability to talk about the use of ICT tools" has a mean of 2.6, teacher's "Readiness to use ICT tools for teaching" has a calculated mean of 4.4 and "Enhancing interactions among students" has a mean of 4.7. Therefore the calculated average mean score for confidence is 3.6.

Findings from Table 4 show that confidence level of respondents is on the increase and efficient as most of them are confident on their usage of ICT tools only that the resources are not available. Table 4 shows accessibility of ICT tools by teachers, that is, where they access ICT tools. 5 places of access were established in this category. The first is the "School" where they teach which has a mean of 2.2. Second, is "Home" with a mean of 2.8. Thirdly, "Cyber café" has a mean of 4.5. "Public libraries" is the fourth with a mean of 1.9 while the fifth is "Friend/Colleague's house" which has a calculated mean of 2.6. Both "School" and "Public libraries" were rejected because of the 2.5 minimum mean for acceptance while "Home" "Cyber café" and "Friend/Colleague's house" were accepted as they have above 2.5. Average mean score calculated for table 5 (access) is 2.8. Findings explain that access to ICT tools is still much dependent on cyber cafés and at home with individual's personal computer. It shows that school authorities are yet to provide ICT tools in schools for teaching and learning.

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The mean score response on the purpose of usage of ICT tools were presented in table 6 and the table explained the accepted items of "Social network" and "Entertainment" with 3.9 and 5.7 mean respectively while "Personal academic activities", "Sport" and "Teaching" with 2.4, 2.4 and 1.8 calculated mean respectively were rejected. Therefore, the average mean score for purpose of usage is calculated as 3.2. The finding therefore shows that respondents uses ICT tools for fun with social network and entertainment rather than other purpose this been that the ICT tools uses are personal and accessed at home.

Table 6 illustrate the mean score response of teachers on teaching and learning using ICT tools. The first item showing if ICT has "Helped teaching of agricultural science" has below minimum mean of 2.3 together with "Facilitating fast learning for agricultural science students" and "Encouraged to teaching agricultural science" with mean of 2.4 and 2.0 respectively were all rejected. However, "Makes teaching agricultural science easy" with a mean of 4.1 and "Will improve teaching of agricultural science" with mean of 3.9 were both accepted. Table 7 has an average mean score of 2.9.

Findings from Table 6 shows that ICT tools could make teaching agricultural science easy and improve teaching the subject but has not facilitated fast learning for students nor encouraged teaching the subject as it has not been used. Table 7 shows the mean score response of teachers on academic performance while using ICT tools. Only "Contributed to personal academic work performance" with a mean of 2.6 was accepted while "Students' use to study and pass examinations", "Contribution to students' academic performance", "Students' performances has risen from average to excellence" and "Made teaching more effective" with mean score of 2.4, 2.3, 2.0 and 2.0 respectively were rejected. The average mean score of performance is 2.3.

It is noted in table 8 that ICT tools has only contributed to personal academic work performance rather than students using it to study and pass examinations nor contributed to students' academic performance. This is in congruence with Shyamal (2006) who reported that ICT enabled learning has impacted education across the globe through the enablement of new patterns and approach in educational practices of teaching and learning. The present day learning has benefitted a lot through projects and problems, inquiry and design, discovery and invention, creativity and diversity, action and reflection.

CONCLUSION

In conclusion, the findings of the study have indicated that there is a very good familiarity level of teachers to ICT tools with the percentage of major ICT tools needed in teaching above average. However, the frequency of usage is not too frequent as a larger percentage uses ICT tools only sometimes because of a reduced rate of

ownership of a personal computer. And that teachers access ICT tools more in cyber cafés than any other place, explaining the fact that ICT tools are not available in schools where they teach. Since availability of ICT tools is more in the cyber café and at home, teachers purpose of usage of these tools are basically for entertainment and social media rather than teaching agricultural science.

Also, the study has indicated that the confidence level of teachers is also promising and ensures that teachers could use and talk about ICT tools in teaching agricultural science but this is however subject to the availability of ICT tools as they do not have the resources (ICT tools) needed. However, on issue bordering on teaching and learning, it was realized that ICT tools will make teaching agricultural science easy and will improve teaching of the subject but since these tools are not available, teachers have not been encouraged to use it. ICT tools which are supposed to help students' performance have fallen short of this. Therefore, ICT tools have contributed to teachers' personal academic work performance at a point in time where they used it themselves.

The significance and relevance of ICT tools in education generally has proven to be a necessity as it will help improve the level and quality of teaching and learning. The basic idea therefore should be on how to manage, utilize and maximize the advantages and benefits it offers for an improved educational system. As indicated from the findings, ICT tools are yet to be used and fully implemented in teaching and learning of agricultural science in secondary schools. Some challenges were realised from the information gathered which goes down to school authority and even the government as the non-usage of ICT tools cannot be blamed on the teachers but on the unavailability of ICT tools for teaching and learning agricultural science.

RECOMMENDATIONS

The researcher recommends that awareness should be created to enlighten secondary school boards and authority on the importance and effectiveness of ICT tools in teaching and learning which has not been practiced in agricultural science and could go a long way to facilitate understanding and improve students' performance. An appeal should also go to the government to help provide major and necessary ICT tools needed such as computers, internet, projector and so on in secondary schools as it will help both teachers and students in the teaching and learning of various subjects and particularly agricultural science which is been studied.

Also, some teachers are yet to be familiar with most ICT tools which is needed such as projector and presentation softwares, such teachers should be ready to learn and make use of these tools in their teaching as it will make teaching much easier and facilitate quick understanding for students and also encourage them to be in class because of the interactive nature of ICT tools which is fun and interesting.

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Abstract

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