



Roles of Information and Communication Technology (ICT) in Enhancing Agricultural Education Graduates' Employability in Agribusiness in South-East, Nigeria

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Abstract

The study determined the roles of ICT in enhancing agricultural education graduate employability in agribusiness in South East, Nigeria. Three research questions and three hypotheses were formulated in line with the specific purposes of the study. The study adopted a descriptive survey research design and it was carried out in federal universities in South East, Nigeria that offer Agricultural Education programme. A population of 68 which consisted of 40 agricultural education lecturers and 18 technical instructors/technologists were studied. There was no sampling since the population was small and manageable. A structured questionnaire was used for data collection. The questionnaire was face-validated by three experts (two lecturers from the Department of Agricultural Education and one lecturer from the Department of Computer and Robotics Education; both in University of Nigeria, Nsukka. Also, the reliability of the instrument was determined using Cronbach Alpha reliability test and a grand value of 0.87 co-efficient was obtained indicating that the instrument was reliable and suitable for the study. The data collected from the study was analyzed using mean and standard deviation. The results from the study found ten (10) agribusiness job opportunities available for agricultural education graduates; ten (10) ICT skills needed for agricultural education graduates' employability in agribusiness; and ten (10) roles of ICT in enhancing agricultural education graduates' employability in agribusiness. Based on the findings, it was concluded that ICT plays a vital role in agricultural education graduates' employability in agribusiness. It was recommended that agricultural education programme at university level should integrate ICT literacy into her curriculum.

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Introduction

Agricultural education is one of the programmes offered in tertiary institutions – colleges of education and universities. It is a multidisciplinary field that combines elements of agriculture, education, and extension services (Olatunji & Olaniyan, 2019). According to Ogundiran (2018), agricultural education is a training programme designed to equip individuals with the necessary knowledge and skills to pursue a career in agriculture and education. The author also stated that agricultural education includes courses in agricultural sciences, agribusiness management, agricultural extension, and farm mechanization. According to Olatunji and Olaniyan (2019), agricultural education encompasses teaching and learning about sustainable farming practices, crop and livestock management, agribusiness, and rural development. Agricultural education in the context of this study is educational programme which is designed to train students in agricultural production processes and in the teaching of agriculture in school.

Agricultural education graduates according to Mudiare and Ajiboye (2021) are skilled professionals who have completed a formal training programme in agricultural education field. These graduates possess a deep understanding of agricultural practices as well as teaching methodology to enable them contribute meaningfully to the society. According to Ibezute and Abdulrazaq (2020), agricultural education graduates have diverse knowledge and skills in agribusiness management, crop and livestock production, agricultural extension, and rural development. They are well-prepared to work in various roles within the agricultural industry and classroom teaching and management. Agricultural education graduates in the context of this study are individuals who have successfully completed Agricultural Education programme at the university or colleges of education level. Agricultural education programmes in universities and colleges of education is meant to equip students with practical skills and knowledge in the area of crop and livestock production as well as in agribusiness management (Mudiare & Ajiboye 2021).

Agribusiness encompasses all economic activities related to the production, processing, and distribution of agricultural products, with a strong emphasis on value addition and market-oriented approaches (Adekunle, 2019). Agribusiness according to Okeke (2021) refers to the entire agricultural value chain, from input supply to production, processing, marketing, and distribution, with an emphasis on creating a sustainable and profitable agri-food system. It involves the application of modern business principles and practices to agricultural production and management, with a focus on increasing productivity and sustainability (Okonkwo, 2020).

Agribusiness in relation to this study refers to the entire process of agricultural production as well as marketing and distributing of agricultural inputs and outputs,

Agribusinesses play essential roles in enhancing economic development and food security of a nation. According to Ogunleye (2020), agribusiness accounts for a significant portion of Nigeria's gross domestic products (GDP) and provide employment opportunities for millions of people. Agribusiness is essential for ensuring food security by increasing agricultural productivity, improving food distribution systems, reducing post-harvest losses, promoting sustainable agricultural practices and improving access to nutritious food options (Adegbola, 2019). Olumide (2018) contended that value chain development in agribusiness is essential for creating linkages between different actors in the agriculture sector and adding value to agricultural products. Agribusiness also perform crucial role in promoting rural development by improving infrastructure, enhancing the livelihoods of rural communities and creating job opportunities (Ibrahim, 2017).

Agribusiness has a lot of job opportunities which agricultural education graduates can engage in for livelihood. The job opportunities from agricultural production (crop and livestock production, processing of agricultural produces, storage, marketing and distribution of farm products (output) to marketing of farm inputs (Fagbemi, 2018). Also, agricultural education graduates can also engage in other aspects of agribusiness such as agricultural extension services, agribusiness management, agricultural research, food processing and preservation among other others (Akande, 2017). According to Akinbile (2020), agricultural education graduates can work as extension officers to provide farmers with the necessary information, training, and resources to improve their agricultural practices. This role helps to bridge the gap between research and practice, ensuring that farmers have access to the latest innovations in farming practices. Adeleke (2018) stated that agricultural education graduates can work in agribusiness management roles where they can oversee the operations of agricultural enterprises, including planning, organizing, and coordinating various activities such as production, marketing, and finance. Furthermore, Olaoye (2018) stressed that the graduates can start their own enterprises and become agricultural entrepreneurs. Agribusinesses can also leverage technology, social media, and e-commerce platforms to scale up their businesses, reach new markets, and contribute to the growth and transformation of the agricultural sector

(Olaoye, 2018). ICT skills play crucial role for one to utilize technology in agribusiness production and management. Every skilled agricultural education graduates need ICT skills in order to function effectively in his/her chosen occupations and in the society at large.

Information and communication technology (ICT), has become an indispensable tool to human existence and survival in this 21st century. ICT has made the world a global village. ICT is defined as a combination of technologies used to manage information and facilitate communication (Onunkwor, 2020). ICT refers to the convergence of information technology and telecommunications to enable the creation, storage, retrieval, and transmission of data (Oyediran, 2019). ICT in agribusiness encompasses the use of technology to improve farming practices, increase productivity, processing, preservation, marketing and distribution of agricultural produces/products so as ensure sustainable agricultural development (Uzokwe, 2020).

ICT plays a significant role in providing agricultural graduates with access to agricultural information, market opportunities, and best practices for farming. By leveraging ICT tools such as mobile applications, agricultural education graduates can enhance their knowledge, make informed decisions, and contribute to the advancement of the agriculture sector (Uzokwe, 2020). ICT skills development is very crucial for effective utilization of ICT in agribusiness. According to Okeke (2018), ICT skills development refers to the process of acquiring and honing technological competencies that are essential for navigating the digital landscape. The author also stressed that developing ICT skills is critical for agricultural education graduates to stay competitive in a technologically-driven industry.

ICT skills and proficiency in Microsoft Office Suite, data analysis, precision agriculture, and communication platforms can enhance agricultural education graduate's efficiency, decision-making abilities, and overall success in agricultural ventures (Uzokwe, 2020). Proficiency in using Microsoft Office Suite is a basic ICT skill that is essential for graduates to be employable in the 21st century; which includes effective use of applications such as Word, Excel, PowerPoint, and Outlook (Oyebode, 2021). Agricultural education graduates also need to possess skills in data analysis. Adewale et al. (2020) added that agricultural education graduates must be able to adept in using data analytics tools to interpret and analyze large datasets for improved decision-making in farming operations. Adewale et al. (2020) emphasized the importance of data analytics in extracting meaningful insights from agricultural data, thereby leading to optimized crop management practices and increased productivity. Another important ICT skills agricultural education need to possess is knowledge of internet of things (IoT). Akinlade et al. (2019) maintain that Knowledge of IoT

technology is crucial for agricultural graduates to implement smart farming practices such as automated irrigation systems, sensor-based monitoring, and precision agriculture.

ICT play beneficial roles in enhancing agricultural graduates' employability in agribusiness in many ways. Some of the ways as noted by Isaiah (2020) include access to online resources and information, e-commerce platforms for marketing and sales, online networking and collaboration opportunities, online mentorship and training programmes, online job applications among others. ICT can enhance agricultural education graduates' employability in agribusiness by providing access to a wide range of online courses and resources. These courses can help graduates acquire new skills and knowledge that are relevant to the agricultural industry, making them more attractive to potential employers (Ogunlade, 2019). ICT can also enhance agricultural education graduates' employability in agribusiness by providing them with access to e-commerce platforms for marketing and selling their products. By leveraging online marketplaces and social media channels, graduates can reach a wider audience and increase their customer base, leading to higher sales and revenue (Ademilua, 2017).

However, in spite of the important roles of ICT in enhancing graduates' employability, a lot of agricultural education graduates from Nigeria tertiary institutions possess insufficient ICT skills needed for employment and job creation. This scenario is not just applicable to agricultural education graduates only but it is also applicable to graduates from other disciplines. It is a common notion that university graduates from Nigeria tertiary institutions are commonly viewed as "half baked". Many of the graduates from Nigeria tertiary institutions today lacks the requisite ICT skills needed in today's labour market (Iroegbu, 2017). The graduates have been reported to be poorly prepared for work and this has serious implications on the quality and relevance of university education (Pitan & Adediji, 2012). Many of the agricultural education graduates lack ICT skills which is very crucial in enhancing their employability in different sectors of the economy like agribusiness. Could it be that agricultural education graduates are ignorant of the important roles of ICT in enhancing graduates' employability in this 21st century? Hence, there is need to determine the roles of ICT in enhancing agricultural education graduates' employability in agribusiness in South-East, Nigeria.

Research questions

1. What are the agribusiness job opportunities available for agricultural education graduates in South East, Nigeria?
2. What are the ICT skills needed for agricultural education graduate employability in agribusiness in South East, Nigeria?

3. What are the roles of ICT in enhancing agricultural education graduate employability in agribusiness in

South East, Nigeria?

Methodology

The study adopted a descriptive survey research design and it was conducted in Federal Universities in South East, Nigeria that offer Agricultural Education programme. The universities are: University of Nigeria, Nsukka (UNN), Michal Okpala University of Agriculture, Umudike, and Nnamdi Azikiwe University, Awka. A total population of sixty-eight (68) which consisted of forty (40) lecturers and eighteen (18) technical instructors/technologists of agricultural education from the three federal university were studied. There was no need for sampling because the population is small and manageable. A structured questionnaire was used for data collection. The questionnaire was face-validated by three experts (two lecturers from the Department of Agricultural Education and one lecturer from the Department of Computer and Robotics Education; both in University of Nigeria, Nsukka. The reliability of the instrument determined by administering the instrument to fifteen (15) respondents in Ebonyi State University, Abakiliki. The data generated from the pilot testing were analyzed using Cronbach Alpha reliability test and the values obtained from the three sections in the instrument were 0.89, 0.86 and 0.85 respectively and a grand value of 0.87 co-efficient was obtained.

Data collection was carried out by the researcher and three research assistants. The research assistants consisted of three postgraduate students of Agricultural Education, one from each of the federal university in South East, Nigeria. A total of 68 copies of the questionnaires were produced and distributed to the postgraduate students in their respective institutions. At the end of the distribution, a total of 65 out of 68 questionnaires were retrieved. Data collected were analyzed using Mean and Standard Deviation. Mean was used to answer all the research questions. The decision rule is that any mean response whose value is 2.50 and above was "agreed" by the respondents while any one whose mean value is below 2.50 was "disagreed" by the respondents. While standard deviation was used to determine how close or far the responses of the respondents were to the mean. All the analyses were done using Statistical Package for Social Sciences (SPSS) software.

Presentation of Results

Research question 1:

What are the agribusiness job opportunities available for agricultural education graduates in South East, Nigeria?

Table 1: Mean responses of the agribusiness job opportunities available for agricultural education graduates in South East, Nigeria

S/N	Item	Mean	S.D	Remark
1.	Crop Production	3.60	0.61	Agree
2.	Livestock farming	3.33	0.76	Agree
2.	Marketing of agricultural produce	3.37	0.77	Agree
3.	Farm management	2.65	0.88	Agree
4.	Marketing of farm inputs	2.90	0.93	Agree
5.	Processing of agricultural produce	3.10	0.80	Agree
6.	Agricultural produce storage	2.90	0.55	Agree
7.	Agricultural extension services	2.70	0.59	Agree
8.	Agricultural research activities	2.67	0.68	Agree
9.	Agricultural consultancy services	2.55	0.99	Agree
10.	Agricultural Entrepreneurship	3.68	0.79	Agree

Key: Total number of respondents (N) = 65; Standard Deviation (SD)

The data presented in Table 1 showed the mean responses and standard deviation of lecturers and technical instructors on agribusiness job opportunities available for agricultural education graduates in South East, Nigeria. From the result, it was revealed that all the 10 items on the agribusiness job opportunities available for agricultural education graduates in South East, Nigeria had mean responses ranged from 2.55 to 3.68, indicating that all the items are the agribusiness job opportunities available for

agricultural education graduates in South East, Nigeria. The standard deviation ranges from 0.55 to 0.99 which shows that the respondents were not far from the mean.

Research question 2: What are the ICT skills needed for agricultural education graduate employability in agribusiness in South East, Nigeria

Table 2: Mean responses on ICT skills needed for agricultural education graduate employability in agribusiness in South East, Nigeria

S/N	Item Statement	Mean	S.D	Remark
1.	ability to use Microsoft Office Suite	3.77	0.86	Agree
2.	ability to analyse and interpret data	2.60	0.60	Agree
3.	Ability to use Digital marketing platforms	3.55	0.42	Agree
4.	Ability to use IoT devices in agriculture	3.15	0.64	Agree
5.	Ability to use Online research sources	3.00	0.60	Agree
6.	ability to use e-commerce platforms	3.00	0.55	Agree
7.	Ability to use Social media platforms	3.55	0.50	Agree
8.	ability to use internet resources	3.44	0.69	Agree
9.	Ability to use block chain technology in agribusiness	2.06	0.69	Disagree
10.	ability to use email for sending and receiving of files	3.45	0.88	Agree
11.	ability to use agricultural management software	2.99	0.57	Agree

Key: Total number of respondents (N) = 65; Standard Deviation (SD)

The data presented in Table 2 showed that all the items except item 9 had mean responses of 2.60 to 3.77 which indicated that the respondents agreed that all items- 1, 2, 3, 4, 5, 6, 7, 8, 10, and 11 are ICT skills needed for agricultural education graduate employability in agribusiness in South East, Nigeria. The standard deviation

of the items ranged from 0.42 to 0.88 which indicated that the respondents are unanimous in their responses as they are not far from the mean.

Research question 3: What are the ways ICT can enhance agricultural education graduate employability in agribusiness in South East, Nigeria?

Table 3: Mean responses on the roles of ICT in enhancing agricultural education graduates' employability in agribusiness in South East, Nigeria?

S/N	Item Statement	Mean	S.D	Remark
1.	Promotes online courses and training opportunities	2.99	0.66	Agree
2.	Facilitates networking with professionals through social media	3.50	0.57	Agree
3.	Promotes mentorship and career guidance via online platforms	3.10	0.60	Agree
4.	Build an online presence through blogging and content creation	2.80	0.73	Agree
5.	Promotes access to online research databases and journals	2.70	0.49	Agree
6.	Promotes access to online newspaper for job advertisement	3.40	0.51	Agree
7.	Facilitates online workshops and training sessions for self-improvement	3.11	0.79	Agree
8.	Promotes access to online job boards and career fairs	2.65	0.86	Agree
9.	ICT tools facilitates language translation and communication in global markets	2.51	0.55	Agree
10.	Promotes cross disciplinary collaborationon and projects	3.00	0.69	Agree

Key: Total number of respondents (N) = 65; Standard Deviation (SD)

Table 3 presented the mean responses on the roles of ICT in enhancing agricultural education graduates' employability in agribusiness in South East, Nigeria. All the 10 items obtained mean responses of 2.51 to 3.50, this implies that the respondents agreed that all the items are on Table 3 are the roles of ICT in enhancing agricultural education graduates' employability in agribusiness. Also, all the items had a standard deviation which ranged from 0.49 to 0.86 indicating that the respondents were not too far from the mean and were close to one another in their opinions regarding the ways ICT can enhance agricultural education graduates' employability in agribusiness South East, Nigeria.

Discussion of the findings

The result in Table 1 revealed the ten (10) agribusiness job opportunities available for agricultural education graduates in South East, Nigeria which are production of crops, livestock farming, marketing of agricultural produce, farm management, marketing of farm inputs, processing of agricultural produce, engaging in storage of farm produce, agricultural extension services, agricultural research activities, agricultural consultancy services, and agricultural entrepreneurship. The findings are in conformity with the finding of Fagbemi (2018) who stated that agribusiness offer job opportunities to graduates in the area of agricultural production

(crop and livestock production, processing of agricultural produce, storage, marketing and distribution of farm products and marketing of farm inputs. The findings are also in line with the findings of Akande (2017) who contended that agricultural education graduates can engage in aspects of agribusiness such as agricultural extension services, agribusiness management, agricultural research, food processing and preservation among other others. Akinbile (2020) also stressed that agricultural education graduates can work as extension officers to provide farmers with the necessary information, training, and resources to improve their agricultural practices. Akinbile (2020) further noted that the role of extension service by agricultural education graduates will help to bridge the gap between research and practice, thereby ensuring that farmers have access to the latest innovations in farming practices. The findings from this study is also in line with Olaoye (2018) who posited that agricultural education graduates can start their own agricultural enterprises and become agricultural entrepreneurs by engaging in agricultural production either in crops or livestock farming enterprises.

The findings in Table 2 identified ten (10) ICT skills needed for agricultural education graduates' employability in agribusiness in South East, Nigeria. The skills are ability to use Microsoft office suite, ability to analyse and interpret data, ability to use digital marketing platforms, ability to use IoT devices in agriculture, ability to use online research sources, ability to use e-commerce platforms, ability to use social media platforms, ability to use internet resources, ability to use email for sending and receiving of files, and ability to use agricultural management software. The findings are line with Uzokwe (2020) who stated that proficiency in Microsoft Office Suite, data analysis, and online communication platforms can enhance agricultural education efficiency, decision-making abilities, and overall success in agricultural ventures. Oyeboode (2021) noted that proficiency in Microsoft Office Suite is a basic ICT skill that is essential for graduates' employability in the 21st century. Proficiency in Microsoft Office Suite includes effective use of applications such as Word processing, Excel, PowerPoint, and Outlook (Oyeboode, 2021). The findings are also in conformity with the findings of Adewale et al. (2020), according to the authors, agricultural education graduates must be able to adept in using data analytics tools to interpret and analyze large datasets for improved decision-making in farming operations.

The findings revealed ten (10) roles of ICT in enhancing agricultural education graduates' employability in agribusiness in South East, Nigeria. The roles include: Promotes online courses and

training opportunities; facilitates networking with industry professionals through social media; promotes mentorship and career guidance via online platforms; build an online presence through blogging and content creation; promotes access to online research databases and journals; promotes access to online newspaper for job advertisement; facilitates online workshops and training sessions for self-improvement; promotes access to online job boards and career fairs; facilitates language translation and communication in global markets; and promotes collaboration on cross-disciplinary projects through ICT platforms. The findings of study strengthened the findings of Ogunlade (2019) who maintained that access to online resources and information can help graduates acquire new skills and knowledge that are relevant to the agricultural industry, making them more attractive to potential employers. ICT can also enhance agricultural education graduates' employability in agribusiness by providing them with access to e-commerce platforms for marketing and selling their products. The findings are also support the findings of Ademilua (2017) who portrayed that agricultural education graduates can leverage in online marketplaces and social media channels so as to expand their chances of employability in agribusiness and other related fields. Also, agricultural education graduates can use online marketplaces and social media channels to reach a wider audience and increase their customer base, leading to higher sales and revenue. The findings of the study also support the findings Olaoye (2018), who maintained that agricultural education graduates can also leverage on technology, social media, and e-commerce platforms to scale up their businesses, reach new markets, and contribute to the growth and transformation of the agricultural sector.

Conclusion

Based on the findings, it was concluded that ICT is a vital tool that is highly needed for agricultural education graduates' employability in agribusiness and other related fields; and every agricultural education graduate need to be ICT literate so as to enhance their employability. ICT plays significant roles in enhancing the employability of agricultural education graduates through promotion of online courses and training opportunities, facilitates networking with industry professionals through social media, promotes mentorship and career guidance via online platforms, build an online presence through blogging and content creation among others.

Recommendations

Based on the findings from this study, the following recommendations are made:

1. Agricultural education lecturers and instructors should expose the students to the different agribusiness job opportunities such as production of crops, livestock farming, marketing of agricultural produce, farm management, and processing of agricultural produce.
2. Curriculum planners at university level should integrate ICT skills into Agricultural Education curriculum programmes to enable the students acquire the vital ICT skills needed in the 21st century workplace.
3. Agricultural Education lecturers should be trained on ICT skills to enable them adopt ICT tools in teaching and learning of Agricultural Education.

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