

TRAINING NEEDS OF AGRICULTURAL EDUCATION LECTURERS IN ARTIFICIAL INTELLIGENCE IN COLLEGES OF EDUCATION IN ANAMBRA STATE

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Abstract

The study examined the training needs of Agricultural Education lecturers in Artificial Intelligence in Colleges of Education in Anambra State. The study adopted a survey design. Two research questions and two hypotheses guided the study. All the 28 Agricultural Education lecturers in two government owned Colleges of Education in Anambra State that offer Agricultural Education was used for the study. A questionnaire constructed by the researcher validated by experts and tested for reliability using Cronbach Alpha method was used for data collection. The research questions were answered using mean and standard deviation while the hypotheses were tested at 0.05 level of significance using t-test. Results of the study revealed that the areas of AI that lecturers need training includes machine learning fundamentals, deep learning, natural language processes, computer vision etc. The strategies for imparting the knowledge and skills of AI to Agricultural education lecturers include interdisciplinary approach, industry partnership, collaborative learning etc. The study recommends amongst others, that government at all levels should provide digital infrastructure to colleges, workshops on AI should be organized for lecturers.

Keywords: Artificial Intelligence, Training needs, Agricultural Education, Lecturers, Colleges of Education.

The world and everything there are constantly changing and thus becoming different in some aspect. The continuous effort to benefit from nature's constant changes is responsible for what is known today as education. Education is an invaluable resource essential for both the individual and societal development.

The crises in education has been of great concern to many and especially to meet the present challenges facing the world in social, political, and economic ramifications as a result of globalization. The implication of this is that new knowledge, new skills and new competencies must be built in the human resource. New technologies are emerging everyday of which Artificial Intelligence (AI) is one of them. Artificial Intelligence refers to the development of computer systems that can perform tasks normally requiring human intelligence. These tasks include learning, reasoning, problem solving. AI in education according to Chien, Xie, Zou and Hwang (2020) is mainly concerned with the development of AI models and other related artifacts that perform cognitive tasks, information delivery and problem solving which was traditionally the exclusive task of the human mind. AI according to Ugwuoti, Ugochukwu, Ugoeze and Ekwe (2023) can augment the capability of teachers by automating routine tasks, providing insights into student learning and suggesting innovative instructional strategies. AI can be integrated in various course areas including Agricultural Education.

Agricultural Education is a process of imparting knowledge, skills and attitude in agriculture to the learner at any level (Osinem, 2008). Agricultural Education lecturers refer to those people that specialized in Agriculture and impart knowledge and skills in Agriculture to the learners. They are professionally trained teachers whose role is to produce future teachers and agriculturists. For these lecturers to meet up with the changing technologies in education, they need training. Training is the aspect of education which lays emphasis on acquisition of practical skills for jobs that is, equipping individuals with the necessary skills for job performance. Training is essential for employment and productivity.

According to Isa (2021), training helps in developing multiple skills and competence that will help enterprises and individuals in order to be able to export productivity. Training ensures that workers remain up to date in knowledge and skills. Lecturers who are the transmitters of skills and knowledge need training. Lecturers refer to those people that impart knowledge and skills to the learners. Lecturer is an academic or educational professional whose primary role is to teach and deliver lectures at tertiary institution.

The integration of AI stands as a transformative force poised to redefine teaching and learning paradigms. As AI systems become more prevalent in education, it is necessary that lecturers should be properly trained in areas of AI to enable them impart the skills to the students, especially in Colleges of Education. Colleges of Education refer to a higher education institutions that train future teachers, educators and education professionals. Its mission is to prepare individuals for careers in teaching, curriculum development, educational leadership and related fields. Since lecturers train the future teachers in Colleges of Education, they should update their knowledge and skills regularly in order to meet up.

Statement of the Problem

Artificial intelligence has become an integral part of various industries, education and others. As AI continues to grow and expand, the demands for skilled professionals in this field have increased significantly. Colleges and Universities play a crucial role in developing the next generation of AI professionals. Since AI is a new area in Education, lecturers who are the trainers have to be acquainted with the skills and knowledge of AI so that they will have something to impart to the students. The question now is what are the training needs of Agricultural Education lecturers in Artificial intelligence?

Purpose of the Study

The main aim of this study is to find out the training needs of Agricultural Education lecturers. Specifically, the study intends to find out:

- (1) The areas of Artificial intelligence that Agricultural Education lecturers need training.
- (2) Strategies for imparting the knowledge and skills of AI to Agricultural Education.

Research Questions

The following research questions guide the study:

- (1) What are the areas of Artificial intelligence that Agricultural Education lecturers need training?
- (2) What are the strategies for imparting the knowledge and skills of AI to Agricultural Education lecturers?

Hypotheses

The following hypotheses were formulated at 0.05 level of significance to guide the study.

Ho₁: There is no significant differences between the mean responses of male and female Agricultural Education lecturers on the areas of AI that Agricultural Education Lecturers need training.

Ho₂: There is no significant differences between the mean responses of male and female Agricultural Education lecturers on the strategies for imparting the knowledge and skills of AI to Agricultural Education lecturers.

Methodology

The study was conducted using two public Colleges of Education in Anambra State that offer Agricultural Education in Anambra State namely, Nwafor Orizu College of Education, Nsugbe and Federal College of Education (Technical), Umuze. The study adopted a survey research design because, it involved collection of data from a representative sample of the population to which generalization will be made. The population of the study comprised of all the 28 Agricultural Education lecturers in the two colleges. All the 28 lecturers was used for the study hence no sampling. The instrument for data collection was a researcher developed instrument. The instrument was structured questionnaire which was divided into two sections titled A and B. Section A of the instrument was designed to elicit response on demographic data from the respondents such as name of college, gender, rank etc. while Section B seeks information on the two research questions. The instrument was designed in a modified Likert scale of Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD). The instrument was validated by three experts, two from Department of Agricultural Education and one from Measurement and Evaluation Department of Federal College of Education (Technical), Umuze. Their corrections and criticisms were used to produce the final draft of the instrument. For purpose of reliability, copies of the instrument were administered on 10 Agricultural Education lecturers from Federal College of Education (Technical), Asaba. Data obtained were subjected to Cronbach Alpha method of reliability analysis and this yielded a value of 0.88 which is indicative of suitable level of reliability. The researcher personally administered the instrument to the respondents and all were returned back representing 100% return rate. Data collected was analyzed using mean and standard deviations for the research questions while t-test statistics was used to test the hypotheses. To reach decision, the mean of the weighting scale was calculated thus

$$\frac{4 + 3 + 2 + 1}{4} = 2.50$$

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Items with mean values of 2.50 and above is regarded as agreed while those with mean values below 2.50 was indicated as disagreed. The Null Hypotheses was rejected if the t-calculated value was greater than the critical value or not rejected if the calculated t-value was less than the critical value.

Results

The results of the study are presented below.

Research Question I

What are the areas of AI that Agricultural Education lecturers need training?

Table I: Mean and Standard Deviations of Respondents on Areas of AI that Agricultural Education Lecturers Need Training

S/N	Items	$\bar{X}$	SD	Decision
1.	Machine learning fundamentals.	3.11	0.56	Agreed
2.	Deep learning.	3.07	0.68	Agreed
3.	Natural language processes.	3.33	0.81	Agreed
4.	Computer Vision	3.19	0.93	Agreed
5.	Programming fundamentals.	2.81	0.64	Agreed
6.	Robotics and autonomous systems.	2.63	0.88	Agreed
7.	AI for Agriculture.	2.80	0.53	Agreed
8.	Human computer interactions.	2.72	0.80	Agreed
9.	AI for cyber security.	2.93	0.45	Agreed
10.	Automated assessment systems.	2.83	0.70	Agreed
11.	Educational Data mining.	3.17	0.58	Agreed
12.	Virtual and augmented reality.	3.08	0.44	Agreed

All the items had mean values above the cut-off point of 2.50 and were all agreed by the respondents as the areas of AI that Agricultural Education lecturers need training.

Research Question 2:

What are the strategies for imparting the knowledge and skills of AI to Agricultural Education lecturers?

Table 2: Means and Standard Deviations of Respondents on the Strategies for Imparting the Knowledge and Skills of AI to Agricultural Education Lecturers.

S/N	Items	$\bar{X}$	SD	Decision
1.	Interdisciplinary approach.	2.85	0.64	Agreed
2.	Industry partnership	3.53	0.66	Agreed
3.	Hands-on learning.	3.40	0.61	Agreed
4.	Invite AI experts to hold workshops for lecturers.	3.15	0.68	Agreed
5.	Utilize online platforms such as Courser to provide lecturers with access to AI related resources and tools.	2.69	0.32	Agreed
6.	Using collaborative learning.	3.10	0.55	Agreed

All the items had mean values above the cut-off point of 2.50 and were all agreed by the respondents.

Hypotheses

Ho₁: There is no significant differences between the mean responses of male and female Agricultural Education lecturers on the areas of AI that lecturers need training.

Table 3: t-test Analysis of no significant difference between the Mean Responses of Male and Female Agricultural Education Lecturers on the Areas of AI that lecturers need Training.

Groups	N	$\bar{X}$	SD	df	t-cal	t-crit	Decision
Male	15	3.08	0.55	26	0.41	1.96	Do not
Female	13	2.99	0.61				Reject Ho ₁

The t-calculated was 0.41 which is less than t-critical of 1.96. This implied that there was no significant differences between the mean responses of male and female Agricultural Education lecturers on the areas of AI that lecturers need training. This was analyzed using df of 26 and at 0.05 level of significance.

Ho₂: There is no significant differences between the mean responses of male and female Agricultural Education lecturers on the strategies for imparting the knowledge and skills of AI to Agricultural Education lecturers.

Table 4: t-test Analysis of no Significant Differences between the Mean Responses of Male and Female Agricultural Education Lecturers on the Strategies for Imparting Knowledge and Skills of AI to Agricultural Education Lecturers.

Groups	N	$\bar{X}$	SD	df	t-cal	t-crit	Decision
Male	15	2.85	0.66	26	0.54	1.96	Do not
Female	13	2.71	0.78				Reject Ho ₂

The t-calculated was 0.54 which is less than t-critical of 1.96. This implies that there was no significant differences between the mean responses of male and female Agricultural Education lecturers on the strategies for imparting knowledge and skills

of AI to Agricultural Education lecturers. This was analyzed at 0.05 level of significance using degree of freedom of 26.

Discussion

Research question 1 was designed to find out the areas of artificial intelligence that Agricultural Education lecturers need training. Results of the study indicates that the areas include: machine learning fundamentals, deep learning, natural language processes, computer vision, programming fundamentals, Robotics and autonomous systems, AI for Agriculture, Human computer interactions, AI for cyber security, Automated assessment systems, educational data mining, virtual and augmented reality. These findings were in line with the work of Ibrahim (2023) who stated that areas of AI includes robotics, human computer interaction and automated assessment systems. Yusuf and Okolo (2024) stated that AI technology on Education includes robotics mediated education, automated assessment systems, educational data mining, virtual and augmented reality. Also Zim (2023) emphasized the need for implementation of machine learning fundamentals in schools.

Research question 2 seeks an answer to the strategies for imparting the knowledge and skills of AI to Agricultural Education lecturers. These strategies include interdisciplinary approach, industry partnership, hands-on-learning, inviting AI experts to hold workshops for lecturers, utilize on-line platforms such as cousera to provide lecturers with access to AI resources and tools, using collaborative learning. These findings were in line with the work of Okunade (2024) who stated that people can acquire skills in AI through using on-line platforms. Minn (2022) stated that people can train themselves in AI by engaging in collaborative learning. This will enable them to acquire skills and knowledge in AI. In his own view, Ofodile (2023) stated that one of the strategies for improving the use of AI in teaching and learning of Agricultural Education is organizing workshops on AI for lecturers.

This will enable them to acquire skills to help train the future generations.

The Hypothesis one tested revealed that a significant differences does not exist between the mean responses of male and female Agricultural Education lecturers on the area of AI that lecturers need training using degree of freedom 26 and 0.05 level of significance.

Also, there is no significant differences between the mean responses of male and female Agricultural Education lecturers on the strategies for imparting the knowledge and skills of AI to Agricultural Education lecturers at 0.05 level of significance and 26 degree of freedom. These findings were in line with the work of Otugo (2023) who worked on the problems of using AI in teaching and learning of Agricultural Education in tertiary institutions and discovered that a significant differences does not exist on the mean responses of male and female Agricultural Education lecturers on the problems facing in teaching and learning of Agricultural Education.

Conclusion

The paper have examined the training needs of Agricultural Education lecturers in Artificial Intelligence in Colleges of Education in Anambra State. The study identified the areas and the strategies for imparting AI skills and knowledge to Agricultural Education lecturers. If these strategies are implemented, the traditional methods of

teaching and learning will be transformed and this will help to achieve the aims of Agricultural Education at tertiary level of Education.

Recommendations

The following recommendations were made:

- (1) Workshops on AI should be organized for Agricultural Education lecturers.
- (2) Governments at all levels should provide digital infrastructure to Colleges.
- (3) Non-governmental organizations should support colleges in the area of computer infrastructure.
- (4) Micro-teaching laboratory in Colleges of Education should be properly equipped to enable the lecturers make use of the resources.
- (5) More textbooks on AI should be made available at colleges through individual effort because government cannot do everything for her citizens.

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