

DEPARTMENT OF AGRICULTURAL EDUCATION

UNIVERSITY OF NIGERIA, NSUKKA

International Journal of Agricultural Education & Research

...advancing research from Africa...



International Hybrid Conference

2025



 IJAER

**Cultivating Future Generations Through Innovations
and Entrepreneurship in Agricultural Education**

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Department of Agricultural Education Annual International Conference

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Theme:

**Cultivating Future Generations Through Innovations and
Entrepreneurship in Agricultural Education**

Tuesday April 8, 2025
Arrivals

Wednesday April 9, 2025
Opening Ceremony

Thursday April 10, 2025
Technical Sessions

Friday April 11, 2025
Departures

Venues:



Physical: Zenith ICT Centre, University of Nigeria, Nsukka.

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Chief Host:



PROF. OGUEJIOFO T. UJAM, B.Sc.,M.Sc.[Nig.],Ph.D.[New Zealand] FCSN
AG.VICE-CHANCELLOR

UNIVERSITY OF NIGERIA





Host:



Prof. Toochukwu E. Ejiofor

**Head of Department,
Department of Agricultural Education, University of Nigeria, Nsukka.**





Speaker:



Prof. Marietta Perez Dlamini
(Ph.D., Ohio State University, USA)

Former Director, University of Eswatini Research Centre.

Department of Agricultural Education and Extension,
University of Eswatini,
Eswatini.



**UNIVERSITY
OF ESWATINI**



Speaker:



Prof. James O.S. Banjo

United Nations Consultant on Livelihood, and
Former Director, Vocational Training & Research in Agriculture,
Tai Solarin University of Education.

Department of Agricultural Economics and Extension, Tai Solarin
University of Education, Ijagun, Ogun state, Nigeria.





Conference Board



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Head of Department,
Department of Agricultural Education, University of Nigeria, Nsukka.
Chief Editor, International of Journal of Agricultural Education and Research



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Dr. Emeka Ogbonna – **Member**



Mrs. Mary O. Ani – **Member**



PROGRAMME OF EVENTS

8th-11th April, 2025

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Tuesday 8th April, 2025:

ARRIVAL

of guests and participants



OPENING CEREMONY

Wednesday, 9th April, 2025.

Time: 10:00 AM West Central Africa

@Zoom Meeting for IJAER Conference 2025.

Physical: Zenith ICT Centre, University of Nigeria, Nsukka.

- 9:30am – Arrival of guests and participants
- 10:00am – Logging in by participants and presenters
- 10:01am – 10:40am: Recognition of Resource Persons and conference participants
- 10:40am – 10:45am: Opening Prayer by Rev. (Dr.) G.E. Eze
- 10:45am – 10:50am: House Keeping Announcements
- 10:50am – 11:00am: Welcome Remark by the LOC Chairman
- 11:00am – 11:10am: Welcome remarks by the Head, Department of Agricultural Education
- 11:10am – 11:20am: Opening Address by the Dean, Faculty of VTE.
- 11:20am – 12:20pm: Presentation by Prof. Marietta Perez Dlamini
- 12:20pm – 12:30pm: Interactive session (Questions and Answers) with Prof. M. P. Dlamini
- 12:30pm – 1:30pm: Presentation by Prof. James O.S. Banjo
- 1:30pm – 1:40pm: Interactive session (Questions and Answers) with Prof. James O.S. Banjo
- 1:40pm – 1:50pm: Short brake / presentation by the entertainment committee/refreshment
- 1:50pm – 2:20pm: Awareness on Ethics in Research by Dr. M. E. Ikehi
- 2:20pm – 2:30pm: Interactive session (Questions and Answers) with Dr. M. E. Ikehi
- 2:30pm – 2:35pm: Closing remarks by Prof. T.E. Ejiofor
- 2:35pm – 2:40pm: Closing Prayer by Mrs. M.O. Ani
- 2:40pm – 3:00pm: House Keeping Announcements.





TECHNICAL SESSIONS

Thursday, 10th April, 2025. Time: 10:00 AM West Central Africa

@Zoom Meeting for IJAER Conference Room 1

@Zoom Meeting for IJAER Conference Room 2:

Physical: Zenith ICT Centre, University of Nigeria, Nsukka.

9:30am – 10:00am: Arrivals at physical venue/Logging in of participants
10:01am – 10:05am: House Keeping Announcements by Dr. M. E. Ikehi
10:05am – 2:30pm: Plenary sessions (Physical, Virtual Room 1 and 2)
2:30pm – 2:40pm: Presentation of communique
2:40pm – 2:45pm: Vote of thanks by Prof. T.E. Ejiofor
2:45pm – 2:50pm: Vote of thanks by Dr. O.A. Okadi
2:50pm – 2:55pm: Closing prayers by Ven. (Dr.) G. E. Eze
2:55pm – 3:00pm: House Keeping Announcements by Dr. M. E. Ikehi

Departure / Log out.

06-Apr-2025 5:35 pm



Friday 11th April, 2025

DEPARTURE

of guests and participants



SCHEDULE OF PAPER PRESENTATIONS

Thursday, 10th April, 2025. Time: 10:00 AM West Central Africa

Morning Session

Time	Room 1
	Moderator: Dr. T.C. Nwakile (<i>Innovations in Agriculture</i>)
10:05	Innovations in Sustainable Agriculture and Environmental Conservation: A Paradigm Shift Towards Eco-Friendly Farming Practices <i>Adejumobi P.</i>
	Innovations in Sustainable Agriculture and Environmental Conservation: Pathways to A Resilient Future <i>Alkali G.N., Sunday, K. Y. and Ezekiel J.</i>
10:20	Harnessing Innovative Strategies for Youth Engagement in Agripreneurship Development: Empowering the Next Generation <i>Ajala, O.S., Adekunle, O.A., Ayejuyo, B.S., Kelani, O.M., Aina, O.E., Ogedengbe, K.K. and Banjo, J.O.S.</i>
10:35	A Review of Innovations in Youth Engagement and Empowerment in Agribusiness Development in Zango Kataf, Kaduna State <i>Ezekiel, J., Alkali, G.N. and Tunzwan, P.A.</i>
10:50	Innovative Technologies for TVET - Private Sector Engagements to Promote Graduate Employability in Enugu State <i>Nosakhare, O.D., Okadi, A. O. and Ikehi, M.E.</i>
11:05	Digital and Smart Technologies in Agricultural Education, Production, and Precision Farming <i>Odoma M.O.</i>
11:20	Cultivating Future Generation through Innovations in Sustainable Agriculture and Environment <i>Ogbonna, E.K., Okwo, C.R., Izuakor, C.F., Eleke P.N. and Ugwuanyi, I.C.</i>
11:35	Smart Cultural Practices Needed by Farmers in Managing Edaphic Factors for Sustainable Crop Production in Enugu State <i>Ekwueme, S.U., Nwachukwu, C.U., Ani, M.O., Onah, F.C., Ogbonna, E.K., Okafor, N.B. and Ameh, H.I.</i>
11:50	Analysis of Technological Trends in Agricultural Production <i>Ugwunnaji, F.C., Ifeanyieze, F.O., Ikehi, M.E. and Emmanuel, G.O.</i>
12:05	Financial Risks Management Strategies for Profitable Poultry Farming in Kwara State <i>Emmanuel, G.O., Onu, F.M., Ikehi, M.E., Ifeanyieze, F.O. and Ugwunnaji, F.C.</i>





Morning Session

Time	Room 2
	Moderator: Dr. Ali, C.C. (<i>Teaching and Learning in Agriculture</i>)
10:05	Integration of Artificial Intelligence in the Curriculum of Agricultural Education for Productivity <i>Ajinu, S.U., Ugwuoke, C.U., Onu, D.O. and Oftem, R.O.</i>
10:20	Developing the Future Workforce through Problem-Based Learning and Entrepreneurship Education in Nigerian Tertiary Institutions <i>Bitrus, G.</i>
10:35	Innovative Pedagogical Strategies for Teaching Sustainable Agribusiness Models in Agricultural Education Institutions in Enugu State <i>Okadi, A.O. and Onoh, O.C.</i>
10:50	Effect of Flip Classroom and Project Instructional Delivery Method on Students' Academic Achievement in Electric Fish Production in Universities in South East Nigeria <i>Ugorji, N.C., Alio, A.N. Oluka, S.N. and Nwafor I.M.</i>
11:05	Effects of Virtual Classrooms on Interest and Academic Achievement among University Students of Agricultural Education in North-Central Nigeria <i>Gotom, Y.D., Ikehi, M.E. and Onu, F.M.</i>
11:20	Utilization of Indigenous Knowledge System in Teaching and Learning of Agriculture in Secondary Schools for Sustainable Agriculture and Environmental Conservation <i>Eze, G.E., Ugwuoke, C.U., Eze, B.C., Omeje, B.A. and Nnabuike, A.M.</i>
11:35	Impact of Digital Technology on Instructional Resources in Teaching and Learning of Agricultural Science in Secondary Schools in Kogi State <i>Jeremiah, M.P., Ejuwa, P.E. and Edor, E.A.</i>
11:50	A Review of Innovation Needs in Organic Food Production and Processing for Sustainable Rural Livelihoods in Nigeria <i>Agu, R.I. and Mojekwu, U.R.</i>
12:05	Analysis of Mass Media Utilization Among Maize Farmers in Funakaye Local Government Area, Gombe State <i>Danladi M.M. and Abdulkadir, B.F.</i>





**Thursday, 10th April, 2025. Time: 12:30 PM West Central Africa
Afternoon Session**

Time	Room 1
	Moderator: Dr. N.N. Bassey (<i>Business and Entrepreneurship in Agriculture</i>)
12:30	Agricultural Development in Nigeria: A Legal Perspective <i>Amucheazi, C.O.</i>
12:45	Role of Business Education in Bridging the Digital Divide in Agricultural Education and Entrepreneurship in Enugu State <i>Madu, M.A. and Ogbuagu, P.N.</i>
12:50	Psychological Empowerment as Correlates of Job Satisfaction, Behaviour and Performance of Accounting Personnel in Agricultural and other Ministries in Enugu State, Nigeria <i>Olinya, T.O., Nwandu, L.O., Anorue, H.C., Ekuma, J.E. and Ugochi, I.C.</i>
1:05	Perceived Potentials of Agricultural Entrepreneurship in Prompting Sustainable Livelihoods among Agricultural Education Graduates in Enugu State, Nigeria <i>Okadi, A.O. and Nworgu, J.N.</i>
1:20	Economic Assessment of Yam Consumption Pattern Among Rural Households in Umuahia North Agricultural Zone of Abia State, Nigeria <i>Uloh, E.V. and Azunku, F.N.</i>
1:35	Entrepreneurial Competencies: Empowering the Youth for Sustainable Farm Enterprises in South-Eastern Nigeria <i>Ifeanyieze, F.O., Ezhim, I.A., Okadi, O.A., Asogwa, V.C., Ikehi, M.E. and Onu, F.M.</i>
1:50	Branding Awareness and Challenges in Agribusiness: An Exploratory Analysis Among Agricultural Education Students at University of Nigeria Nsukka <i>Ejinkeonye-Christian, P.C. and Ikehi, M.E.</i>
2:05	Gender Issues in Agricultural Education and Entrepreneurship <i>Edor, E.A. and Ogbudu T.O.</i>
2:20	Entrepreneurial skills required by secondary school graduates in quail farming for food security in Federal Innovative Teaching Methods for Sustaining Pupils Interest in Agriculture in Primary Schools in Nsukka LGA, Enugu State <i>Ekwo, E.N., Eze, L.N., Jerome, N.J., Kanayochukwu, E.L. and Abuadinma F.C.</i>
2:35	Essential Entrepreneurial Skills for Effective Business Development and Management in Duck Farming Enterprises in Enugu State <i>Nwankwo, C.U., Nwosu P.I. and Nnofu, J.A.</i>
2:50	Perception of the Influence of Cooperative Society on Farmers' Income and Productivity in Nsukka Local Government Area <i>Ikehi, M.E. and Godswill, D.C.</i>
3:05	Gender in Agricultural Education and Entrepreneurship: Bridging Gaps for Sustainable Development <i>Jagboro E.T. and Odoma, M.O.</i>
3:20	Agricultural Entrepreneurship Skills as a Panacea for Enhancing Graduates Self-reliance for National Economic Growth and Sustainable Development in Nigeria <i>Okadi, A. O., Umaru, K.I. and Ezema, A.N.</i>



Afternoon Session

Time	Room 2
	Moderator: Dr. E.K. Ogbonna (<i>Farming</i>)
12:30	Precision Agriculture in Nigeria: A SWOT Analysis <i>Asogw, V.C., Ali, C.C. and Isiwu, E.C.</i>
12:45	Challenges to Indigenous Climate Change Adaptation Practices by Farm Households in Udi Local Government Area, Enugu State <i>Chime, P.I., Nwakile, T.C. and Ejiofor, T.E.</i>
12:50	Effect of Different Growing Media on the Growth and Yield Performance of Two Varieties of Okra Grown in Bags <i>Ede, A. E., Uloh, E.V., Osadebe, V. O., Ofor G. O. and Ezeaku, E. I.</i>
1:05	Adoption of Sack Farming Model for Enhancing the Teaching and Learning of Agricultural Science in Urban Secondary Schools in Abia State <i>Onah, O. and Gideon, N.M.</i>
1:20	Exploring the Role of Innovative Drought Control Measures in Improving Crop Yield and Farmers Livelihood in Benue State, Nigeria <i>Onoriode, O. and Umaru, K.I.</i>
1:35	Proximate Composition and Anti-nutrients profile of Pleurotus tuber-regium Biodegraded Harvest Paddy Waste for Livestock feeds <i>Ukpong, G.U., Okah, U. and Mbam, O.J.</i>
1:50	Effects of Botanical Extracts on Maize Pest Control in Nsukka Agro-Ecological Zone, Enugu State <i>Okpe, C.E., Ugwu, M.I. and Okafor, J.U.</i>
2:05	Urban Agricultural Practices in Nsukka Metropolis: Constraints and Enhancement Measures <i>Agbo, F.C. and Ejiofor, T.E.</i>
2:20	Effects of Concentration Rates of Moringa Leaf Extract on Velvet bean Caterpillar in Groundnut Plant Under Sack Technology in University of Nigeria Nsukka <i>Eke, M.C.</i>
2:35	Effects of Organic and Inorganic Manure on Growth and Yield of Carrot in Nsukka Local Government Area, Enugu State <i>Nwankwo, C.U., Chukwuemeka, G.U. and Ifeanyieze, F.O.</i>
2.:50	Effect of Pig and Poultry Manure on the Growth and Yield of Tomato in Nsukka, Enugu State <i>Ezebuio, F.N., Ekenta, L.U., Onah, O. and Nwoye, G.E.</i>
3:05	Assessing The Anti-Nutritional Composition of Okra at Different Stages of Maturity to Enhance Farmers Profitability in Nsukka Local Government Area of Enugu State <i>Ifeanyieze F.O., Omeje, B.A. and Amadi, C.N.</i>
3:20	Effects of Different Types of Manure on Growth Performance of Turmeric in Nsukka Local Government Area <i>Ugwunnaji, F.C., Ifeanyieze, F.O., Ugwuoke, C.U., Ikehi, M.E. and Emmanuel, G.O.</i>





WELCOME ADDRESSES

IAER 2025



**WELCOME ADDRESS BY THE LOCAL ORGANISING COMMITTEE
CHAIRMAN, DR A. O. OKADI AT THE ANNUAL HYBRID
CONFERENCE OF THE DEPARTMENT OF AGRICULTURAL
EDUCATION HELD FROM WEDNESDAY, 9TH TO FRIDAY 11TH APRIL
2025 AT THE MAIN HALL OF THE ZENITH ICT CENTER,
UNIVERSITY OF NIGERIA, NSUKKA**

The Dean, Faculty of Vocational and Technical Education, Prof. T. C. Ogbuanya
The Lead Paper Presenters

- Professor M. P. Dlamini, Department of Agricultural Education and Extension, University of Eswatini, South Africa, and
- Professor J. S. O. Banjo, Department of Agricultural Economics and Extension, Tai Solarin University of Education, Ijagun, Ogun State

Distinguished Guests,

Most Respected Colleagues

Conference Participants

My Dear Students

Distinguished Ladies and Gentlemen.

On behalf of the Local Organizing Committee (LOC), I am delighted to welcome you to this year's Annual Hybrid Conference of the Department of Agricultural Education. It is both an honour and a privilege to gather brilliant minds from stakeholders in Agricultural Education and beyond to discuss and explore ways for shaping the future of graduates.

The theme of this year's conference, Cultivating Future Generations through Innovations and Entrepreneurship in Agricultural Education reflects our desire to equip young people with the skills, knowledge, and attitude required to drive needed transformations in the agricultural sector. As members of the Local Organizing Committee, we have worked hard to create a conducive environment to stimulate discussions and interactions to generate actionable solutions to practical problems in Agricultural Education.

The future of agriculture in Sub-Saharan Africa depends on how well agricultural education institutions train, mentor, and empower the future generation of her graduates. Education and training in agriculture must continue to evolve to embrace modern technology, sustainable practices, and business-oriented approaches to prepare students for real-world challenges. This conference provides a platform to exchange knowledge and ideas on how to integrate technological innovations such as precision farming, digital agriculture, climate-smart solutions, biotechnology, artificial intelligence, and entrepreneurship into agricultural education, bridge the gap between education institutions and industry, and promote collaborations among researchers, educators, policymakers, and entrepreneurs to drive sustainable agricultural practices.



Further, entrepreneurship education has been promoted as key to the full exploitation of the business potentials of any given field of study. In agriculture, there is a need to instill the knowledge, skills, and attitude to facilitate the transition from agriculture as a way of life to agriculture as a business, and for young people to view agriculture as a lucrative and viable career. Agricultural education and training institutions must begin to consider the need to train students in business management, financial literacy, agribusiness development, and market-driven production models.

We in the local organizing committee extend our sincere appreciation to the Head of the Department of Agricultural Education, Professor T. E. Ejiofor for the immerse support for this conference, and the Dean of the Faculty of Vocational and Technical Education, Professor T. C. Ogbuanya for creating an enabling environment to make this conference a reality. To all participants, I urge you to make the most use of this conference to engage in thought-provoking discussions, ask questions, build networks, and collaborate with peers and experts. I urge you to relax and thrill yourselves with the array of programmes and series of activities arranged for this conference.

Once again, welcome to the conference! We look forward to productive and inspiring sessions ahead.

Thank you.

Dr A. O. Okadi

Local Organising Committee Chairman.



WELCOME ADDRESS BY THE HEAD OF DEPARTMENT OF AGRICULTURAL EDUCATION AT THE ANNUAL HYBRID CONFERENCE OF THE DEPARTMENT HELD FROM WEDNESDAY, 9TH TO FRIDAY 11TH APRIL 2025 AT THE MAIN HALL OF THE ZENITH ICT CENTER, UNIVERSITY OF NIGERIA, NSUKKA.

The Dean, Faculty of Vocational and Technical Education **Prof. T. C. Ogbuanya**
The Lead Paper Presenters

- **Professor M. P. Dlamini**, Department of Agricultural Education and Extension, University of Eswatini, South Africa, and
- **Professor J. S. O. Banjo**, Department of Agricultural Economics and Extension, Tai Solarin University of Education, Ijagun, Ogun State

Distinguished Guests

Esteemed Colleagues

Conference Participants

My Dear Students

Distinguished Ladies and Gentlemen.

I have the great pleasure to welcome you all to this year's Annual Hybrid Conference of the department, with the theme: **Cultivating Future Generations through Innovations and Entrepreneurship in Agricultural Education**. Whether you are joining us physically or virtually, your presence is a testament to your commitment to advancing agricultural education and empowering future generations.

Agriculture remains the backbone of many economies worldwide, particularly in developing nations, where it provides food, employment, and economic stability. However, to remain relevant and competitive in the face of evolving challenges such as climate change, technological advancements, and market dynamics, we must rethink traditional methods of agricultural education.

Innovation and entrepreneurship have become critical pillars in preparing the next generation of agricultural professionals, to ensure they possess the skills, creativity, and business acumen needed to drive sustainable growth in the sector. Innovation in agricultural education means embracing new technologies, involving modern teaching methods, and ensuring industry-driven curricula that equip students with relevant skills. With these in focus, we now required to integrate innovations such as digital tools, precision farming techniques, biotechnology, and artificial intelligence into our teaching and learning approaches.

Beyond innovation, entrepreneurship is key to transforming agriculture from subsistence practices to sustainable agribusiness ventures. Instilling an



entrepreneurial mindset in students will empower them to contribute more to individual and national economic. It is no longer enough for graduates to seek jobs; they must be equipped with the knowledge and confidence to create jobs and contribute to economic growth.

To achieve these goals, there is a need for strong collaboration among educational institutions, research organizations, policymakers, industry players, and development partners. This conference provides a platform to share experiences, best practices, and cutting-edge research that will shape the future of agricultural education. Together, we can bridge the gap between education and industry, and ensure that our graduates are well-prepared to meet the demands of the evolving agricultural landscape.

As we embark on this conference, I encourage open dialogue, knowledge sharing, and active participation. Let us use this opportunity to inspire new ideas, build networks, and develop actionable strategies that will redefine agricultural education for future generations.

I wish you all a fruitful and impactful conference.

Thank you.

**Prof. T.E. Ejiofor,
Head, Department of Agricultural Education,
Faculty of Vocational and Technical Education,
University of Nigeria, Nsukka.**



**OPENING ADDRESS BY THE DEAN OF THE FACULTY OF
VOCATIONAL AND TECHNICAL EDUCATION, PROFESSOR
THERESA CHINYERE OGBUANYA AT THE HYBRID CONFERENCE
OF THE DEPARTMENT OF AGRICULTURAL EDUCATION,
UNIVERSITY OF NIGERIA, NSUKKA HELD FROM WEDNESDAY, 9TH
TO FRIDAY 11TH APRIL 2025 AT THE MAIN HALL OF THE ZENITH
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Professors Present

Distinguished Guests

Most Respected Colleagues

Conference Participants

my Dear Students

Distinguished Ladies and Gentlemen.

It is with great honor and enthusiasm that I welcome you all to this year's **Annual Hybrid Conference**, organized by the **Department of Agricultural Education**. This year's theme, "**Cultivating Future Generations through Innovations and Entrepreneurship in Agricultural Education**," is both timely and essential. As we navigate an era of rapid technological advancements, environmental changes, and shifting global economies, it has become imperative to rethink the way we educate and equip young minds for the agricultural sector.

Agriculture is no longer just about traditional farming; it has evolved into a complex, technology-driven industry that requires cutting-edge research, digital tools, and modernized teaching methodologies. To cultivate future generations, we must integrate innovations, innovative and sustainable practices into our education system to foster not just the regular teaching and learning but to include entrepreneurship.

While innovation enhances agricultural productivity, entrepreneurship is the driving force that translates ideas into viable businesses to drive the economy. The future of agriculture depends not just on skilled graduates but on agripreneurs who can identify opportunities, create sustainable agribusinesses, and contribute to economic growth.



Developing an entrepreneurial mindset among students will encourage agribusiness start-ups, value addition, supply chain improvements, and rural economic transformation. Agricultural education must go beyond theoretical knowledge; it should provide students with hands-on experience, mentorship, and access to funding opportunities that will help them turn their ideas into successful ventures.

I understand that the transformation of agricultural education cannot happen in isolation. It thus, requires strong collaboration between universities, research institutions, government agencies, private sector players, and policymakers. This conference provides a unique opportunity for key stakeholders to exchange ideas, share best practices, and forge partnerships that will drive meaningful change in the sector.

As a faculty that is skills based, we are committed to ensuring that our students graduate to become job creators, innovators, and leaders in industries. We must continue to create enabling environments for students to explore new ideas, test business models, and gain practical experience that prepares them for the real-world challenges of modern society.

As we engage in discussions over the next few days, I encourage each one of you to actively participate, contribute your insights, and collaborate on solutions that will revolutionize agricultural education. On behalf of the Faculty of Vocational and Technical Education, I extend my gratitude to the Department of Agricultural Education for organizing this important event.

I am confident that this conference will not only inspire innovation and entrepreneurship but will also spark new initiatives that will shape the future of agricultural education. I look forward to a communique from this conference that will offer recommendations for championing the next actions for innovations in agricultural education.

I therefore declare this conference open.

I thank you for participating and I wish you all fruitful deliberations.

Professor Theresa Chinyere Ogbuanya
Dean, Faculty of Vocational and Technical Education,
University of Nigeria Nsukka.



Lead Presentations

IAAER 2025



Meet Prof. MARIETTA PEREZ DLAMINI

Prof. Marietta Perez Dlamini who has a PhD in Agricultural Education from the Ohio State University, USA.

She is an expert in Research and Data Analysis, Psychology and Development Communication

She has utmost interest in developing values in undergraduate and postgraduate students, because she believes that academic and values development in individuals are keys to success in agricultural fields and agribusiness. She also believes in entrepreneurship development in students, so they have other stream of income aside from being employed. She was instrumental in the development of a Values Education course in the current Master of Science in Agricultural Education programme. She herself is a co-director of a business. She does urban horticulture. She is academic as well as a hands-on person.

She:

Taught for about 32 years in the Department of Agricultural Education and Extension, mainly research courses at undergraduate, Masters and PhD levels

Held the position of Head of the Department for 13 years and Director of University of Eswatini Research Centre for 7 years

Published 34 journal articles, 1 book chapter and 2 monographs

Presented 29 edited and 37 unedited conference papers and attended another 28 conferences

Been a Keynote Speaker, and co-editor of conference proceedings

Been a member of 3 journal editorial committees

Attended 6 professional development trainings abroad

Organised 21 seminars and workshops

Has given many seminars and workshops in research and supervision of students' research

Was a Consultant in 8 different projects

Won 9 research grants

Received 3 awards

Received PhD and undergraduate study grants

Vice Chairman then Chairman of 2 Africa-wide research organisations

Led drafting of Research Guidelines for Undergraduate and PhD Levels

Was External Examiner for Botswana University of Agriculture and Natural Resources (BUAN) and University of Northwest (UNW), South Africa

Supervised completion of 6 PhD dissertations and 24 Masters Theses and more than 90 undergraduate research projects

Travelled 90 times abroad on university or academic missions





LEAD PAPER ONE



Values Education for Future Agricultural Education Graduates with Innovations and Entrepreneurship Mindset

Professor Marietta Perez Dlamini

Department of Agricultural Education and Extension

Faculty of Agriculture, University of Eswatini

Email: mper@uneswa.ac.sz

Lead Paper Presented at the Annual Hybrid Conference of the Department of Agricultural Education, University of Nigeria, Nsukka, and International Journal of Agricultural Education and Research, April 9-11, 2025.

Theme: Cultivating Future Generations Through Innovations and Entrepreneurship

Abstract

Agricultural and values education, together with innovations-entrepreneurship are intertwined requirements for today's higher agricultural education graduates, to thrive in ethical and socio-economic challenged environment with fast evolving technologies. The negligible integration of values and entrepreneurship means future farmers and agripreneur may not be adequately equipped to make ethical and responsible decisions. The objectives: define values education leading to individual values; and propose integrating values education in agricultural education as well as cultivating innovations-entrepreneurship mindset in students and assessments of these in agricultural education. The Systemmatic Review of Literature (SRL) was used to search, select, appraise, and then synthesise the findings (Tong et al, 2012). The relationship between values and entrepreneurial success framework was used. Values education in agricultural education adopted from Navaro (2018) "instilling ethical principles, moral reasoning, and social responsibility while acquiring knowledge and skills related to agriculture; and by FAO (2014) "emphasising sustainable practices, environmental stewardship, work ethics, and community engagement promoting responsible agricultural development. Values eventually promoted in individuals - honesty, diligence, cooperation, and respect for nature. Agricultural educators can integrate values education into the course content, teaching and assessment strategies, such as sustainability and environmental stewardship by graduates, ethics and integrity, community and social responsibility, and innovation and adaptability. Innovation-entrepreneurship mindset is cultivated in students by incorporating independent entrepreneurship course, and through the teaching strategies using the real-world situations and assessments, such as through case studies, workshops, and project-based learning. Recommendations include strengthening values education and teacher education, and enhancing experiential learning and industry collaboration.

Key words: Values, values in agriculture, agriculture/agricultural teachers, innovators, entrepreneurs.



1. Introduction – Justification, Statement of the Problem, and Objectives

Justification

The topic seems odd, because it has a head (values education) and a tail (innovations and entrepreneurship mindset). This is deliberate though, because today's agricultural education future graduates need both in their teacher education programme.

Values education helps instil to students an appreciation for sustainable practices in agriculture, social responsibility toward farming communities, and integrity in agribusiness, (Tilbury, 2017). Secondly, cultivating innovations and entrepreneurship is a must if graduates are faced with economic hardships. Innovations may come before entrepreneurship, within it, or comes after entrepreneurship (innovations-entrepreneurship –innovations). Therefore, the use of the term entrepreneurship includes innovations before, within, or after. Thirdly, having incorporated innovations and entrepreneurship mindset to students will make them survive after graduation when faced with economic hardship. In order to create a more holistic agricultural education, it is crucial to integrate values education focused on environmental ethics and sustainability (Shiva, 2016) and social justice (Vanclay, 2004), as well as entrepreneurship for self-reliance (Evans-Obinna, 2016).

Agricultural education has undergone significant transformations, driven by technological advancements, sustainability concerns, and the need to capacitate students with entrepreneurial skills. Innovations in teaching strategies, digital tools, and agribusiness development have enhanced learning experiences and economic opportunities in the agriculture sector (Rivera & Alex, 2008). Today, part of the transformation is the integration of values education and incorporation of innovations-entrepreneurship.

Problem being Addressed

Values education in agricultural education plays a crucial role in addressing various issues related to ethics, sustainability, and responsible agricultural practices. Some key problems it can address include environmental degradation (Tilman et al., 2017), ethical farming practices (Fraser, 2008), food security and sustainability (Godfray et al., 2010), youth engagement and rural development (FAO, 2014), economic responsibility (Van der Ploeg, 2018), and cultural and social responsibility (Pretty et al., 2011). The negligible or unintended non-integration of values education in agricultural education means future farmers and agribusiness professionals may not be adequately equipped to make ethical and responsible decisions.



Objectives

The primary objective of the presentation is to provide useful information on values education and suggest actions that higher agricultural educators may take in order to integrate values education. The secondary objective is to present strategies on developing the innovation-entrepreneurship mindset in future graduates.

2. Methodology

The Systematic Review of Literature (SRL) was carried out through literature search, selection, appraisal, and synthesis of findings (Tong et al, 2012).

Literature Selection Criteria:

Publications from peer-reviewed journals and books (on theories) were searched on academic databases and findings were noted.

The search incorporated seven key words: (i) values education and strategies; (ii) values; (iii) values education challenges and overcoming strategies; (iv) values education assessment challenges and overcoming strategies; (v) innovations; (vi) entrepreneurship; and, (vii) innovations and entrepreneurship. The literature found was screened to remove review articles, duplicated articles, and irrelevant articles based on their titles.

The final screening yielded 68 articles, were analysed, synthesised and evaluated. The literature used was the relevant ones under each subtopic. Forward and backward citation checks were also carried out to identify studies missed in the database search.

The educational and entrepreneurship theories supporting values education were also searched and SRL was also applied. The “Relationship between Values and Entrepreneurial Success” framework was selected and adopted.

3. Values Education in Agricultural Education

Values education in agricultural education refers to the process of instilling ethical principles, moral reasoning, and social responsibility in students while acquiring knowledge and skills related to agriculture (Navaro, 2018). It emphasises sustainable practices, environmental stewardship, work ethics, and community engagement to promote responsible agricultural



development (FAO, 2014). This form of education also integrates values that must be possessed by individuals such as honesty, diligence, cooperation, and respect for nature into agricultural learning and practices (Taneja, 2016).

4. “Integrating” Values Education and “Incorporating” Entrepreneurship in Agricultural Education

Integrating values education means it should be within agricultural courses for practice of agriculture, while *incorporating* entrepreneurship means an addition in the agricultural education programme as separate course/s for future graduates’ possible socio-economic opportunities and challenges. The content, teaching and assessment strategies for agricultural and entrepreneurship courses are the avenues through which they can be integrated or incorporated, respectively.

Curriculum and programme development normally are faced with a dilemma of prioritising the much-needed content and implementation, respectively. In integrating values education to agricultural education, key values in agriculture will have to be identified to ensure higher chances that they are considered into the curriculum content and implementation (programme).

5. Key Values for Agricultural Education

In today’s agriculture teacher education, the key values content that could be integrated into agricultural courses could fall under the following broad content areas. First, in the sustainability and environmental stewardship by graduates, showing they understand and teach sustainable farming practices, resource conservation, and climate resilience (Pretty, 2020). Second, graduates possessing ethics and integrity. Rollin (2018) highlights, agriculture involves ethical considerations such as fair trade, responsible pesticide use, and animal welfare. Third, graduates demonstrate community and social responsibility in agricultural, rural development, food security, and social justice (Francis et al., 2016). Lastly, graduates’ innovation and adaptability in the agriculture sector, require graduates to promote innovation while maintaining ethical considerations (Vanclay, 2019).

6. Educational and Entrepreneurship Theories Supporting Values Education

The theories serve as bases for analysing the intersection of agricultural education, values, and entrepreneurship in agriculture. The theories support the argument that well-rounded



agricultural education future graduates should be grounded in strong ethical principles and entrepreneurial education to enhance the likelihood of their success in agribusiness ventures. The *Constructivist Learning Theory* pioneered by Piaget and Vygotsky (1920s to 1960s) emphasises active learning where individuals construct knowledge through experience. In agricultural education, constructivism supports experiential learning strategies such as hands-on farming activities, problem-solving tasks, and project-based learning. The theory endorses fostering innovative thinking and adaptability, the key attributes for entrepreneurial success in agriculture. *Human Capital Theory* by Becker (1964) posits that investment in education and skills development leads to increased productivity and economic growth. In agricultural education, human capital is developed through formal education, vocational training, and experiential learning, equipping individuals with technical, managerial, and decision-making skills. Schumpeter (1934) pioneered *the Innovation Theory* on the role of innovation in economic development. It suggests that entrepreneurs drive change by introducing new products, processes, and business models. In agriculture, innovation manifests in precision farming, sustainable agricultural practices, and agribusiness diversification, all of which contribute to long-term entrepreneurial success. The *Core Values in Agricultural Education framework* identified key values essential for both ethical conduct and sustainable entrepreneurship with: (i) integrity – ensuring honesty and ethical decision-making in agribusiness practices. (ii) responsibility – taking accountability for environmental stewardship, resource management, and social impact. (iii) sustainability – encouraging long-term viability of agricultural practices through eco-friendly and economically-sound approaches, and (iv) resilience – developing adaptability to market fluctuations, climate change, and technological advancements. The *Relationship Between Values Education and Entrepreneurial Success in Agriculture framework* states that values education plays a fundamental role in shaping the innovative-entrepreneurial mindset in agriculture. Individuals develop responsible business practices that align with social and environmental priorities, by integrating ethical and sustainable principles into agricultural education. Studies indicate that entrepreneurs who prioritize integrity and sustainability achieve long-term profitability while maintaining community trust and ecological balance. Additionally, resilience-building through education enhances risk management and problem-solving abilities, leading to business continuity and growth.

The presentation adopted the theory on *Relationship Between Values Education and Entrepreneurial Success in Agriculture framework*, because values education can shape



graduates ethical and sustainable agricultural practices as well as responsible innovative-entrepreneurial mindset for business.

7. Teaching Strategies for Values and Entrepreneurship

Today's economic situations in nations demand that future graduates survive and thrive in a world with changing socio-cultural and technological demands. Therefore, cultivating graduates with the right values as well as entrepreneurship mindset cannot be overemphasised.

Teaching Strategies for Values Education

The broad philosophy or theory that guides teaching and learning including values in agricultural education revolve around experiential learning such as fieldwork, case studies, and problem-based learning, which allow students to engage with real-world ethical dilemmas (Kolb, 2015). Another is the interdisciplinary teaching of combining agricultural science with philosophy, ethics, and social sciences enrich students' moral reasoning (Taylor & Fransman, 2021), need to be promoted. Encouraging future graduates to reflect on their values and biases to enhance their ability to practice ethical decision-making (Dewey, 2018) can be ingrained into students' mind as a normal process. Educators making values education as an **interactive, interdisciplinary, and real-world-oriented experience** will unlock students internalising the moral principles and apply them in their everyday lives. Integrating values education will satisfy the need of instilling the right ethics in agriculture and individual development of values in the long term.

Key values identified for the agricultural courses lead to identifying teaching strategies that may be employed. Galt et al. (2012) argue for a values-based pedagogical approach, suggesting that courses should explicitly address the values underpinning different agricultural and food systems, as well as those shaping educational strategies and experiences. One approach is introducing problem-solving and efficiency tools (Dweck, 2006) by teach students to use technology (e.g., AI, automation) to streamline workflows and reduce costs. This could involve case studies and project work on current technologies in business. Students can also look at product and service innovation Drucker (1985), by doing practical exercises that involve incremental and breakthrough innovations and by encouraging students to redesign existing products/services through prototyping and iterative testing.



An Example of an African University which Integrates Values Education in the Programmes and to Engage in Agriculture

The Landmark University in Nigeria drives societal transformation through education and further focuses on agriculture, technology, and entrepreneurship. Its mission is to spearhead an agrarian revolution in Africa. Landmark University integrates values education into its programmes and encourages students to also engage in agriculture. The university promotes high moral and ethical standards, coupled with aiming to restore the nation's focus on agriculture and address food security challenges. Collaborations with leading agricultural institutions further enhance the practical dimensions of the programmes. This institution exemplifies how education can be enriched through the integration of values education and fostering future professionals who are committed to ethical practices in agricultural engagement.

Assessment of Values

Values education in agricultural education can be evaluated in many areas. In the curriculum integration, educators and researchers may examine the extent to which sustainability, environmental stewardship, and social responsibility are incorporated into agricultural education (Jones & Brown, 2019). **Educators' self-evaluation on the teaching methods and pedagogy** they use when employing experiential learning techniques, ethical case studies, and discussions that challenge students' values can easily be incorporated in their teaching sessions (White et al., 2021). **Student learning outcomes** such as students' ability to make ethical agricultural decisions while balancing economic, social, and environmental factors can be measured (Taylor, 2018). The **assessment tools** educators use such as surveys, interviews, reflective essays, case studies, community projects, and behavioural observations can be used to assess students' values (Johnson & Lee, 2022). The eventual **impact on agricultural practices** on graduates' consequential implementation of sustainable and ethical practices in their communities (Davis, 2020) is an interesting area to research. Ultimately, assessing values education in agricultural education involves evaluating how ethical, social, and environmental principles are integrated into learning and applied in agricultural practice. The assessment focuses on students' attitudes, decision-making abilities, and behaviours concerning agricultural sustainability, ethical farming, rural development, and food security (Smith, 2020). Assessing values education can be challenging, because values are deeply personal, often subjective, and not always easily measurable.



8, Challenges in Values Education and Assessment of Values

Challenges in Values Education and Overcoming Strategies

Integrating values education content into agriculture courses, as well as incorporating entrepreneurship content and teaching strategies in higher agricultural education faced challenges. However, a number of strategies have already been tried in countering each of the challenges (FAO, 2014). The challenge of resistance to change was addressed by *involving the key stakeholders*: the parents, and future graduates, were included in planning to gain their support. A *clear communication is needed* to explain the benefits of the content of values education for personal and societal growth is needed. Creating *small steps for change can be through* starting with pilot programmes, allowing time to reflect and adapt, and by ensuring *supportive leadership* by leaders modelling the benefits of the content to be taught to guide the change. The lack of training materials was addressed in numerous ways: *collaborative development*, by universities and organizations working together to create relevant materials and by *adapting existing materials* by modifying current educational resources to include the needed content. The professional development of educators was ultimate solution to improving their ability to teach the content. The challenge of *using technology is addressed* by creating engaging, up-to-date learning resources.

Addressing these challenges through collaboration and adaptation, values education can be more effectively integrated, and entrepreneurship incorporated, respectively, into agriculture teacher curriculum, teaching strategies and assessments, as well as in agricultural education programme delivery.

Challenges in Assessment of Values and Overcoming Strategies

Assessment of values education is not without its challenges. Some of the challenges experienced are found in literature. The **subjectivity in evaluation** of the ethical perspectives is often personal and difficult to measure objectively (Harris & Miller, 2017). The **long-term impact measurement** as application of values in real-world settings takes time and may not be immediately observable (Clark, 2016). Anderson (2019) found **balancing multiple factors**, such as students considering the economic, environmental, and social responsibilities simultaneously, complicating assessment. Educators **lacking standardized tools** or lack of universally accepted metrics for evaluation (Moore, 2018). The **influence of external factors is much a challenge according to** Parker and Green (2021), such as the cultural background,



societal norms, and economic pressures affecting students' values, making assessment outcomes variable. Other strategies were suggested by FAO (2021), such as focusing on policy support, increased investment in research, and wider access to digital resources.

Carbonilla, Advincula, Adonis-MA and Roperez (n.d.) advocated for supportive educational environments, experiential learning opportunities, to better equip students to overcome barriers and effectively apply the values learned in school in various life contexts. Some other specific challenges and strategies to overcome challenges in assessment of values education were found in literature. The lack of resources can be alleviated by advocating for adequate resources, including training for educators and access to technology. The time constraints can be solved by prioritizing values education and allocate sufficient time for assessment and feedback. Resistance from stakeholders can be minimised by engaging parents, administrators, and community members in the process of values education and assessment. The cultural sensitivity can be assured by assessment methods being culturally appropriate and inclusive.

9. Innovations and Entrepreneurship in Agricultural Education: Developing the Mindset of Future Graduates

The presentation takes each of the mindsets as separate elements (innovation; entrepreneurship) and then, a combined element (innovation-entrepreneurship). A mindset in the context of innovation (Drucker, 1985) involves developing new ideas, methods, or technologies, while entrepreneurship involves taking risks to bring those innovations to market. Drucker (1985) also states that, innovation typically comes before entrepreneurship, because entrepreneurship often relies on innovative ideas, products, or processes to create value and establish a business. Entrepreneurship according to Dweck (2006) refers to an individual's cognitive framework, attitudes, and beliefs that shape the approach to identifying opportunities, solving problems, and creating value through novel (innovative) solutions (the during and after of entrepreneurship). However, Drucker (1985) added that entrepreneurship can also drive innovation by identifying market needs and encouraging the development of new (innovative) solutions. These two elements (innovation and entrepreneurship) could be incorporated into the agricultural education programme as an entrepreneurship course and through its teaching and assessment strategies.



Incorporating Innovations in Teaching Strategies

Innovations in agricultural education involve the integration of digital tools, experiential learning, and modern farming techniques. Key innovations assessment areas, therefore, are on **digital learning platforms looking at** online learning management systems, virtual simulations, and mobile applications facilitating agricultural education beyond traditional classrooms (Lambrecht et al., 2014). Lowenberg-DeBoer and Erickson, (2019) suggested looking at **precision agricultural technologies such as use of** drones, Geographic Information Systems (GIS), and remote sensing technologies enabling students to apply data-driven decision-making in farming. Ultimately, the **sustainable farming practices** creating innovations in organic farming, permaculture, and hydroponics are integrated into ~~curricula~~ programmes to promote environmentally friendly agricultural practices (Pretty, 2008).

Another innovation is on competitive strategy (Tidd & Bessant, 2018) of including assignments where students identify and analyse companies that have successfully differentiated themselves in the market, and then ask them to develop their own competitive strategies. A practical profit optimization (Yunus, 2007) examination of real-world scenarios where students can apply cost reduction, process improvements, and new revenue models is an innovative approach. Having simulations or internships with companies focusing on process innovation could be highly beneficial. Tilbury (2017) suggests tackling global challenges by encouraging students to design solutions for societal issues like sustainability or healthcare, integrating the concepts of green technologies and digital solutions into their projects. A fostering of economic growth through innovation scenario suggested by Rogers (2003) is another innovation by students working on business plans or case studies that show how innovation leads to job creation and economic growth, helping them connect theory with practical applications.

Incorporating Entrepreneurship in the Agricultural Education Programme

Experts and researchers have presented their ideas on how innovation - entrepreneurship-innovation can be incorporated as course/s and teaching strategies for real world situations: Rogers (2003) advocated for fostering economic growth by assigning students to create new business models or redesign existing ones that can enhance productivity or market efficiency, simulating the role of an entrepreneur in the economy. Promoting job creation according to Acs and Audretsch (2003) will engage students in creating business plans for small and medium enterprises (SMEs), emphasising strategies for sustainable job creation in the process. The wealth creation and distribution line of thought by Kirzner (1973) suggests assigning students



projects focused on identifying market gaps, then designing entrepreneurial ventures that solve these gaps while promoting equitable wealth distribution. Yunus (20027) believes in social entrepreneurship. This is focusing on socially conscious entrepreneurship through case studies on companies with a dual focus on profitability and addressing social or environmental issues. The global expansion thinking by Acs and Audretsch (2003) stated that having students research and present on strategies for businesses entering international markets can promote the skills needed for global entrepreneurship.

Despite the progress, *challenges identified in incorporating entrepreneurship in programmes* are limited funding, resistance to technology adoption, and inadequate infrastructure hindering the full potential of innovations and entrepreneurship (Agwaral, Samadhiya, Banais and Kumar (2024). The inadequate staffing and insufficient learning materials were highlighted by Shuwa, Ahmed and Gambo (2023). By focusing on real-world applications, students can engage directly with the principles of innovation and entrepreneurship, translating theory into practice. Adding internships, case studies, workshops, and project-based learning can give students a robust, hands-on education.

Assessment of Innovation-Entrepreneurship

Innovation-entrepreneurship in agricultural education can be examined on how it fosters self-reliance and agribusiness development among students. Key areas that can be assessed include **agribusiness training**. This entails looking at students' ability to do business planning, market analysis, and financial literacy are essential components of modern agricultural education (Sulewski & Kłoczko-Gajewska, 2014). The **hands-on learning activities of students in** on-campus farms, cooperatives, and field attachments in real-world entrepreneurial settings (Franz et al., 2014) may also be assessed. The collaboration between the **government and private sector** funding agripreneurship initiatives and providing mentorship programmes is an interesting area to look at (Daum, 2018). The real-world scenario of **accessing markets and finance, especially** microfinancing and digital marketplaces supporting young agricultural innovator-entrepreneurs in launching and scaling their businesses (World Bank, 2020) are ultimate assessment areas to delve into.

Some researchers have assessed innovation-entrepreneurship education. Melhorn, Miles, Bonney and Tewari (2017) looked at students' oral communication, motivation and the ability to recognize opportunities. Another study measured innovation-entrepreneurship foster self-



reliance and promote economic development and self-sufficiency (Shuwa, Ahmed and Gambo, 2023). Similarly, Okello, Mshinga, Saidi, Juma Maria, Egeru and Gogo (2024) assessed the teaching and innovation-entrepreneurial competencies of the instructors. Holanda (2021) studied how innovative-entrepreneurial skills contribute to scalable and negotiable businesses in rural areas. The link between innovation-entrepreneurship education and the career aspirations of students was investigated by Ifeanyi-Obi and Ewurum (2019).

10. Connecting Values Education and Entrepreneurship

Values education and entrepreneurship are closely linked in several ways, as both contribute to personal and societal development. The key connections are found in ethical decision-making (Rollin, 2018) when values education instils principles like integrity, responsibility, and fairness. Entrepreneurs who uphold these values build trust with customers, employees, and investors, leading to sustainable business practices, entrepreneurs' resilience and perseverance. Darnhofer (2014) suggest values education promotes resilience, patience, and perseverance and entrepreneurship requires overcoming failures and setbacks, making resilience a crucial trait. Social responsibility by Vanclay (2019) states values education emphasises giving back to society and considering the well-being of others. Entrepreneurs who embrace social responsibility create businesses that address social enterprises and eco-friendly businesses. The innovation and problem-solving (Morris, 2019) abilities are developed such as curiosity, creativity, and adaptability foster innovation. Entrepreneurs need these traits to further develop unique products and services. The leadership and teamwork (Leithwood, et al., 2006) abilities are developed as values education emphasises respect, collaboration, and leadership skills. Successful entrepreneurs lead teams, inspire employees, and build strong partnerships. The self-discipline and accountability for one's actions are developed (Kahan, 2012), much needed in managing finances, meeting deadlines, and maintaining professional ethics. The long-term vision and purpose (Yunus, 2007) creation are developed which go beyond financial success and positively impact society.

By connecting values education and innovations-entrepreneurship, agricultural educators can cultivate business leaders who are not only ethical, responsible, but also innovative and financially successful.



11. Conclusions and Recommendations

Conclusions

Values education is essential in shaping well-rounded agricultural professionals by fostering ethical decision-making, critical thinking, and social responsibility. Integrating values education and incorporating innovation and entrepreneurship equip students with both technical expertise and a strong moral foundation, enabling them to address agricultural and social challenges sustainably. Programmes like ENACTUS support this approach by mentoring students in ethical agribusiness practices (Omotosho, 2023).

Agricultural programmes are increasingly including innovations (within entrepreneurship) in their programme as a matter of necessity, because of decreased employment opportunities. Incorporating innovation and entrepreneurship into higher agricultural education presents several challenges, as highlighted in the UNESCO report (2018) providing a comprehensive overview of the challenges African universities face, which include institutional rigidity and limited resources, in terms of start-up capital and land.

Ultimately, the key is for businesses to view sustainability not as an obstacle but as an opportunity to innovate and differentiate them in the market. By integrating sustainability into the DNA of any entrepreneurship, companies can often find creative solutions that allow them to be both responsible stewards of the planet and profitable.

Despite challenges such as institutional resistance and limited resources, incorporating sustainability into agricultural business models (through entrepreneurship) presents opportunities for ethical and profitable solutions. Ultimately, agricultural educators and entrepreneurs play a key role in instilling integrity, environmental stewardship, and social responsibility, ensuring a more sustainable future for the agricultural industry.

Recommendations

Based on the points raised on integrating and assessing values education in the curriculum through the teaching strategies and assessments and incorporating innovations and entrepreneurship into agriculture teacher programme and assessing them, a number of recommendations could be made. First, higher education institutions should integrate structured ethics education into agricultural content, incorporating case studies, real-world dilemmas, and reflective practices. Teacher training programmes must equip educators with methodologies to seamlessly impart ethical principles alongside technical knowledge.



Another is agricultural education should adopt hands-on approaches like fieldwork, internships, and community projects that immerse students in ethical decision-making. Strengthening partnerships with agribusinesses, research institutions, and NGOs will provide mentorship, funding, and real-world exposure, fostering values-driven innovation and entrepreneurship. A key recommendation is for educational policymakers to advocate for curriculum reforms that merge values education with entrepreneurship and innovation. Universities should establish incubation centres and innovation hubs, offering financial support such as grants and seed funding to help students develop business ideas rooted in ethical and sustainable practices.

The monitoring of impact and promotion of lifelong learning should be built-in in as research areas. Also, the institutions should develop and implement tools to evaluate the effectiveness of values education, measuring students' ethical decision-making, sustainability practices, and impact on entrepreneurial success. Graduates should also be encouraged to engage in continuous learning through workshops, professional courses, and industry networking.

By implementing these recommendations, agricultural education institutions can cultivate a new generation of graduates who are not only technically skilled but also ethically grounded, innovative, and entrepreneurial. This holistic approach ensures the sustainability of agricultural practices while fostering economic growth and social responsibility in the sector.

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LEAD PAPER TWO



Meet PROF. JAMES O.S. BANJO

James Olanrewaju Sunday BANJO is an accomplished teacher of over 4 decades experience in the classroom. He is an experienced farmer, scholar, agricultural and public administrator, builder of entrepreneurs and agripreneurs, author, consultant, and Professor of Vocational Agricultural Education. He is a past head, department of Agricultural Science Education, Tai Solarin University of Education (TASUED), Ijebu-ode, Ogun state, Nigeria. His research interests include Cooperative Vocational Agricultural Education, Entrepreneurship, Livelihoods development and administration, Curriculum development and dynamics of pedagogy in Agriculture. He attended Government College Ibadan in the seventies and he is also an alumnus of Trans-World College, New-Jersey, Britain. He holds a bachelor's degree in Education and Agricultural Science from the University of Calabar and degree of Masters and Doctor of Philosophy (Ph.D) in Vocational Agriculture from the University of Nigeria, Nsukka.

He is a member of senate and also board of studies, Centre for Entrepreneurship and Vocational Studies (CENVOS) of TASUED. He is a decorated ambassador of Justice and Peace in Nigeria. He served the United Nations as the first consultant on Livelihoods Development and administration in Nigeria. His template facilitated the training and empowerment of over 10,000 refugee returnees and internally displaced persons of concern in the Northeast of Nigeria. He was Director, Institute of Vocational Training and Research in Agriculture (IVOTRA), TASUED. As the Director of IVOTRA, the center focused on training of out-of-school youth and retirees in various agricultural skills towards self-reliance and self-sufficiency. Prior to being a director, he was the Assistant Coordinator, Pre-Degree and Degree Foundation programme of TASUED and was also elected member of TASUED Trust foundation. The foundation sourced for funds and was able to contribute to the growth and development of the University in the area of structures and development of information communications technology (ICT) of the university. Professor James O. S. Banjo is widely traveled and has also attended and facilitated many seminars, workshops and symposia within and outside the country where he has presented scholarly papers. This includes the high-powered workshop on the Development and Administration of Small and Medium Scale Enterprises facilitated by CICED, India. Aside being a member of many professional organizations, he has over 90 publications in both local and international journals to his credit out of which are 15 high school books published by high profile publishing houses in Nigeria and also chapter contributions in 6 tertiary texts. He has supervised many undergraduate projects and over 30 masters' dissertations.



He has also supervised 10 Doctor of Philosophy (Ph.D) candidates. He is a visiting Professor and examiner to 7 universities in Nigeria as well as being a consultant to Justice Development and Peace Commission and United Nations. He is a member, Board of trustees, association of small-scale agro-producers in Nigeria (ASSAPIN) where he has been contributing immensely to the efforts of thinking positively for small scale farmers on food availability, affordability and security in Nigeria. James is a member of many academic and professional associations which include, Nigeria Conservation Foundation (NCF), Nigeria Educational Research Association (NERA); Nigeria Association of Teachers of Technology (NATT); Nigeria Vocational Association; League of Researchers of Nigeria (LORON); Farm Management Association of Nigeria; National Association of Rural Sociologists; Worldwide Organization of Organic Farmers (WOOF) and Children and Youth in Agriculture Programme (CYIAP). He is happily married to Margaret; a community development practitioner and the marriage is blessed with children. To the glory of God, James and Margaret are Jerusalem pilgrims and faithful Christians.





Fostering Sustainable Agripreneurship Amongst Youth Through Appropriate Classroom Engagements

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Introduction

In an era where global challenges such as food insecurity, climate change, and economic instability loom large, the agricultural sector stands at a pivotal crossroads (junction), calling for a critical decision that should lead to a major shift in our nation's path and future. The shift is nothing but the classroom engagements that leads to entry-level skill development among our youth. The need for innovative solutions and sustainable practices has never been more urgent, particularly as the world's population continues to grow. In this context, agripreneurship which is the fusion of agriculture and entrepreneurship emerges as a vital pathway for youth to engage with and transform the agricultural landscape. By harnessing the creativity, energy, and technological savvy of young individuals, we can cultivate a new generation of agripreneurs who are equipped to tackle these pressing issues.

Classroom engagements play a crucial role in nurturing this agripreneurial spirit among youth. Educational institutions serve as incubators for ideas, providing students with the knowledge, skills, and practical experiences necessary to thrive in the agricultural sector. Through innovative curricula that blend theoretical learning with hands-on activities, students can explore the multifaceted world of agripreneurship. This approach not only enhances their understanding of agricultural practices but also empowers them to develop entrepreneurial mindsets, fostering critical thinking, problem-solving, and collaboration.

Moreover, integrating agripreneurship into classroom settings encourages students to connect with their local communities, understand market dynamics, and appreciate the importance of sustainable practices. By engaging with real-world challenges and opportunities, youth can envision themselves as active contributors to the agricultural economy, driving change and innovation. As we embark on this journey to foster agripreneurship among young learners, it



is essential to recognize the transformative potential of education in shaping the future of agriculture and ensuring a resilient, food-secure world. Agriculture remains a cornerstone of economic growth, food security, and employment in many developing nations, including Nigeria. However, the sector faces increasing challenges, including low youth participation, outdated farming practices, and limited entrepreneurial innovation. To address these concerns, agripreneurship has emerged as a dynamic solution, integrating entrepreneurship with agriculture to create sustainable and profitable agribusiness ventures. Through effective agricultural education and appropriate classroom engagement, young individuals can develop the necessary skills, knowledge, and innovation required to thrive in modern agribusiness.

Concept of Agripreneurship

Agripreneurship is the fusion of agriculture and entrepreneurship, promoting innovation, risk-taking, and value creation in farming and agribusiness. Unlike traditional farming, agripreneurship emphasizes sustainability, market-oriented production, and efficient resource utilization. Key principles of agripreneurship include adopting modern agricultural techniques, integrating value-added processing, and leveraging digital technology to enhance productivity. In Nigeria, agripreneurship is gaining traction through initiatives like organic farming, agro-processing (e.g., cassava-to-garri production), and value chain enhancement (e.g., yam flour production). Government-driven programmes such as the Youth Entrepreneurship Support Programme (YES-P) aim to promote youth participation in agribusiness by providing financial support and business development training (Federal Ministry of Youth and Sports, 2023). Sustainable agripreneurship further extends this concept by incorporating environmentally responsible farming practices, financial viability, and long-term resilience against climate change. Beyond economic growth, it plays a crucial role in addressing social challenges such as food insecurity, poverty alleviation, and rural development.

The broader implications of sustainable agripreneurship extend to economic diversification and national resilience, critical priorities for a nation historically tethered to volatile oil revenues. Contributing 21% to GDP (NBS, 2024), agriculture offers a stable alternative if harnessed through sustainable entrepreneurial ventures. Such efforts not only create jobs—reducing the 33.3% youth unemployment rate—but also bolster food security by increasing local production, aligning with the National Agricultural Technology and Innovation Policy (NATIP, 2021–2025) goals of doubling productivity (Federal Ministry of Agriculture and Rural Development, 2021). Furthermore, sustainable agripreneurship fosters resilience against



environmental threats like desertification in the north and flooding in the south, ensuring agriculture remains viable amidst climate change.

By nurturing a generation of agripreneurs who innovate within ecological limits, Nigeria can address poverty, with 40% of its population below the poverty line (World Bank, 2024), and contribute to global sustainability goals (United Nations, 2023). Sustainable agripreneurship, thus, is not just an agricultural strategy—it's a blueprint for a resilient, inclusive, and prosperous Nigerian future.

Concept of Agricultural Education

Agricultural education is the systematic teaching and training related to agriculture, encompassing topics like farming, food production, natural resource management, and related sciences, aiming to equip individuals with knowledge and skills for careers in the agricultural sector.

Key Aspects of Agricultural Education:

Scope: It covers a broad range of topics, including plant and animal sciences, soil science, agricultural economics, food processing, and sustainable agriculture practices.

Learning Methods: Agricultural education utilizes various teaching methods, including theoretical instruction, hands-on training, real-world fieldwork, and supervised agricultural experiences (SAEs).

Career Focus: It prepares students for careers in farming, agricultural research, extension services, food processing, and related industries.

Agricultural education plays a crucial role in ensuring food security, promoting sustainable agricultural practices, and fostering innovation in the agricultural sector.

Components: Agricultural education programmes typically include formal classroom instruction, career experience programs, and leadership development.

Levels: Agricultural education can be found at various levels, including secondary schools, community colleges, and universities.

Supervised Agricultural Experience (SAE): SAEs are student-led, instructor-supervised, work-based learning experiences that result in measurable outcomes within a predefined set of Agriculture, Food and Natural Resources (AFNR) Technical Standards and Career Ready Practices aligned to a career plan of study.

Agricultural education plays a fundamental role in equipping students with the knowledge and skills needed for successful engagement in the agribusiness sector. In Nigeria, agricultural



education provides training in farming techniques, agribusiness management, and sustainable resource utilization. The primary objectives of agricultural education include:

1. Enhancing students' understanding of modern farming technologies and agribusiness models.
2. Developing entrepreneurial skills to enable self-employment in agriculture.
3. Encouraging sustainable agricultural practices to ensure food security and environmental conservation.
4. Bridging the gap between theoretical knowledge and practical applications in farming and agribusiness.
5. Addressing socio-economic challenges, such as unemployment, through skill-based agricultural training.

Concept of Classroom and Classroom engagements

A classroom is a room, typically in a school or educational institution, where teaching and learning activities take place, providing a space for students and teachers to interact and engage in education. One of the most effective strategies for fostering sustainable agripreneurship is through appropriate classroom engagement, which encompasses formal and informal learning environments, including school classrooms, laboratories, demonstration farms, agribusiness incubators, vocational training centers, and community-based agricultural programmes. Traditional agricultural education models have prioritized theoretical knowledge, often at the expense of practical and entrepreneurial skill development (Ajani et al., 2015). However, contemporary approaches, including experiential learning, problem-based instruction, vocational agriculture, and digital education, have shown remarkable success in preparing students for real-world agribusiness challenges (Kolb, 2014; Oloruntoba & Ajibefun, 2022).

Classroom engagement refers to the level of interest, motivation, and active participation students show in their learning experiences, encompassing emotional, behavioral, and cognitive involvement. Student engagement is the degree of attention, curiosity, interest, optimism, and passion students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education. Classroom engagement is multidimensional, It's not just about classroom participation; it encompasses all aspects of a student's learning experience, including emotional, behavioral, and cognitive involvement. More importantly, when students are engaged, they are more likely



to be motivated, active participants in the classroom, and achieve better academic outcomes.

Classroom engagement is beneficial to student as it impacts every aspect of a higher education organization's operations, from grades to relationships with teachers and even alumni relations later.

Types of engagement

Behavioral engagement: Refers to the visible actions that students take to participate in their learning process, which leads to higher academic performance.

Emotional engagement: Refers to the feelings and attitudes students have towards learning and the learning environment.

Cognitive engagement: Refers to the mental effort and focus students put into their learning.

How to encourage classroom engagement:

- Create a Positive Learning Environment:
- Establish a classroom where students feel safe, respected, and valued.
- Incorporate Active Learning Techniques: Use strategies that require students to actively participate in the learning process, such as group work, discussions, and problem-solving activities.
- Use Technology as a Tool for Engagement:
- Integrate technology into the classroom to make learning more interactive and engaging.
- Differentiate Instruction: Tailor instruction to meet the diverse needs and learning styles of all students.
- Encourage Active Participation and Collaboration: Create opportunities for students to share their ideas, work together, and learn from each other.
- Provide Timely and Constructive Feedback: Offer regular feedback that helps students understand their strengths and areas for improvement.
- Connect learning to the real world: Make the learning relevant to students' lives and experiences.
- Engage with your students' interests: Find out what interests your students and incorporate those interests into your lessons.



- Use mixed media: Incorporate a variety of media, such as videos, images, and audio, to keep students engaged.
- Get your students moving: Incorporate movement into your lessons, such as stand-up activities or games.
- Ask open-ended questions: Encourage students to think critically and express their ideas. Open-ended questions encourage detailed responses rather than simple "yes" or "no" answers, prompting reflection and exploration of thoughts and ideas. They often begin with words like "why," "how," "what," or "describe".
- Encourage students to share their work: Give students opportunities to present their work to the class or to a small group.
- Give and ask for feedback: Create a culture of feedback where students can learn from each other and from the teacher.

Statement of the Problem

Despite the potential of agricultural education in the development of entry level skills of graduates at various levels of agricultural education and training in Nigeria, there still exist numerous challenges such as unemployment, food insecurity, lack of raw materials for agro-industrial development, resulting from climate change, and economic instability, including inadequate funding, outdated curricula, a shortage of qualified teachers, and limited infrastructure in rural schools culminating to low youth participation, outdated farming practices, and limited entrepreneurial skill development (Banjo, 2024). Additionally, the lack of hands-on training and exposure to modern farming technologies further weakens the effectiveness of agricultural education (Azuka, 2017). The current trends of these diversified challenges are further fuelled by the inappropriate classroom engagements by the teacher of agriculture leading to deficit in knowledge, skills and attitudes of the students to address the challenges wholistically. Addressing these challenges through innovative educational reforms is critical for fostering sustainable agripneurship among youths by the integration of agricultural education with entrepreneurship as a means of fostering sustainable agripneurship among youths.

Agriculture remains a critical sector in many economies, particularly in developing regions such as sub-Saharan Africa and South Asia, where it provides employment, food security, and raw materials for agro-industrial development (FAO, 2021). However, despite its importance,



youth participation in agribusiness remains limited due to socio-economic, institutional, and perception-based barriers (Adekunle & Fatunbi, 2018). Many young individuals view agriculture as a labor-intensive and unprofitable venture, often opting for careers in industries perceived as more lucrative and less physically demanding (Mwaura, 2020). This growing disinterest poses a significant challenge to food security, rural development, and the sustainability of agribusiness enterprises.

To reverse this trend, agripreneurship a blend of agriculture and entrepreneurship has emerged as a promising solution to revitalize the sector and attract young people by integrating innovation, technology, and value addition (Bairwa et al., 2014). Sustainable agripreneurship, in particular, emphasizes environmentally responsible farming, financial viability, and long-term resilience (Pretty et al., 2018). With the global population projected to reach nearly 10 billion by 2050, there is a pressing need to develop sustainable food production systems and empower young people with the skills and resources necessary for agribusiness success (Godfray et al., 2010).

Vocational agriculture plays a pivotal role in bridging the gap between theoretical learning and practical application. It offers students hands-on training in farming, agribusiness management, agro-processing, and value addition, equipping them with skills essential for self-employment and enterprise creation. Countries that have integrated vocational agricultural training into their education systems have recorded higher youth engagement in agribusiness and improved employment outcomes (Asenso-Okyere & Davis, 2011). For instance, the Songhai Agricultural Center in Benin has successfully trained thousands of young agripreneurs, with over 70% establishing profitable agribusinesses after completing their programs (Zinnah & Steele, 2016). This paper critically examines the role of appropriate classroom engagement, including vocational agriculture, experiential learning, and digital agribusiness training, in fostering sustainable agripreneurship among youths. It explores the barriers to youth engagement, the impact of skill development programs, and policy interventions necessary to promote agripreneurship. By offering evidence-based insights and real-world case studies, this research contributes to the ongoing discourse on agricultural education reform and youth empowerment in agribusiness.

Youth Perceptions of Agribusiness

Perception plays a critical role in shaping youth engagement in agribusiness. Studies indicate that many young individuals perceive agriculture as an unattractive career option due to its



association with poverty, uncertainty, and hard labor. This perception is often fuelled by societal attitudes, lack of exposure to modern agricultural practices, and inadequate career guidance within educational institutions. Banjo et al. (2017) emphasizes the importance of reshaping these perceptions through comprehensive vocational training that highlights the profitability and sustainability of modern agribusiness practices. Their study on managerial skills in entrepreneurship among undergraduates in Oyo State, Nigeria, found that students exposed to agribusiness training exhibited a more positive outlook toward agriculture as a viable career path.

By integrating practical agriprenurship training in classrooms, educational institutions can bridge this gap and enhance youth employability in the sector. Banjo and Nosiru (2018) argue that vocational training significantly influences the post-school livelihoods of graduates, particularly in agribusiness. They emphasize that hands-on agricultural training helps develop the necessary entrepreneurial mindset for self-employment in the sector. To address these concerns, agriprenurship has emerged as a dynamic solution, integrating entrepreneurship with agriculture to create sustainable and profitable agribusiness ventures. By equipping young individuals with the necessary skills, knowledge, and innovation through effective agricultural education and appropriate classroom engagement, the agribusiness sector can be revitalized to attract more youth participation.

Contribution of Agriculture to Nigeria's GDP (2024)

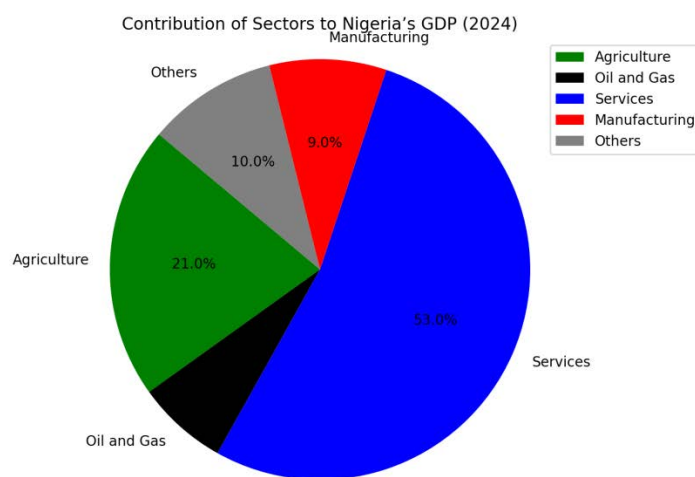


Fig 1: A pie chart showing agriculture's 21% contribution to Nigeria's GDP, with segments for other sectors (e.g., oil, services, manufacturing) based on NBS (2024) data. This visual emphasizes agriculture's economic significance.



Dwindling Nature of Nigerian Agriculture

Nigeria remains a key global producer of several staple crops, particularly cassava, yam, and sorghum. According to the Food and Agriculture Organization (FAO, 2023), Nigeria produced approximately 59.6 million metric tons of cassava, 47.5 million metric tons of yam, and 6.8 million metric tons of sorghum in 2022, making it the leading global producer of these crops. Additionally, rice production stood at 6.8 million metric tons, and maize production reached 10.1 million metric tons, placing Nigeria among the top 15 producers globally (World Bank, 2024). However, despite these impressive figures, Nigeria's agricultural production is declining relative to domestic demand and global competition. Food importation has surged, reflecting a growing reliance on foreign agricultural products. For instance, in the first quarter of 2024 alone, Nigeria's agricultural import bill rose by 30% to ₦920 billion (National Bureau of Statistics, NBS, 2024). This trend suggests that the domestic food supply is insufficient to meet the needs of Nigeria's rapidly growing population, which is projected to exceed 230 million by 2030 (United Nations, 2023).

One major indicator of Nigeria's dwindling agricultural production is the increasing food insecurity within the country. A joint report by Nigeria's Federal Ministry of Agriculture and the United Nations (2024) estimates that over 30 million Nigerians will face food insecurity in 2025, representing a 33% increase from the previous year. This sharp rise in food insecurity underscores the failure of domestic agricultural production to sustain food supply. Furthermore, food inflation has worsened due to the declining supply of agricultural products. According to the National Bureau of Statistics (NBS, 2024), Nigeria's food inflation reached 36.38% in June 2024, significantly increasing the cost of staple foods like rice, maize, and beans. The depreciation of the naira has further aggravated the situation, making imported food more expensive and inaccessible to many Nigerians (Central Bank of Nigeria, 2024).

Factors Contributing to the Decline in Agricultural Production

Several factors associated to deficit in agricultural education and training stemming from inappropriate classroom engagements have contributed to the dwindling nature of Nigeria's agricultural production. This include but not limited to the following;

1. Climate Change and Environmental Degradation
2. Flooding and Natural Disasters
3. Insecurity and Armed Conflicts
4. Economic Policies and Market Instability



1. Climate Change and Environmental Degradation

Climate change poses a significant threat to agricultural productivity in Nigeria. Rising temperatures, erratic rainfall, and desertification have negatively affected crop yields and livestock production (IPCC, 2023). According to Global Forest Watch (2024), Nigeria lost approximately 1.25 million hectares of tree cover between 2001 and 2022 due to deforestation, increasing the risks of soil degradation and desert encroachment. The continued degradation of arable land has reduced the productivity of farmers, particularly in northern Nigeria, where desertification is most severe (World Bank, 2024).

2. Flooding and Natural Disasters

Flooding has also been a major setback for Nigerian agriculture. The 2024 floods, which affected 29 states, were particularly devastating, destroying over 1.5 million hectares of farmland and displacing more than nine million people (National Emergency Management Agency, NEMA, 2024). The destruction of croplands has led to reduced harvests, exacerbating food shortages and increasing the need for food imports (United Nations Office for Disaster Risk Reduction, UNDRR, 2024).

3. Insecurity and Armed Conflicts

The growing insecurity in Nigeria has significantly hindered agricultural production. Farmers in the northern and central regions frequently face attacks from armed groups, including Boko Haram insurgents and armed herders (International Crisis Group, 2024). Many farmers have abandoned their fields, leading to a decline in cultivated land and lower food production. A report by Oxfam (2024) indicates that agricultural productivity in conflict-prone areas has dropped by nearly 40% in the past five years due to displacement and fear of attacks.

4. Economic Policies and Market Instability

Economic instability and government policies have also contributed to the decline of agricultural production. The removal of fuel subsidies in mid-2024 increased the cost of transportation and farm inputs, making agriculture more expensive and less profitable for smallholder farmers (Central Bank of Nigeria, 2024). Additionally, the weakening of the naira has incentivized informal cross-border exports of staple foods, such as maize and sorghum, further reducing local food availability (Reuters, 2024).

Factors Influencing Youth Engagement in Agripreneurship

Several factors influence the willingness and ability of youths to engage in agribusiness. These include:

- i **Access to Finance:** Limited access to capital remains a significant barrier for young agripreneurs. Traditional financial institutions often perceive agricultural investments



as high-risk, making it difficult for young entrepreneurs to secure loans or credit facilities. Banjo et al. (2017) highlights that lack of access to startup capital is one of the most significant deterrents for students considering agribusiness. They recommend the introduction of student-friendly agribusiness credit schemes to encourage participation.

- ii **Education and Skill Development:** The mismatch between agricultural curricula and market demands has led to a skills gap that hinders effective participation in agribusiness. Banjo and Nosiru (2018) argue that practical, competency-based training can bridge this gap and enhance youth employability in the sector. Their study found that graduates who received hands-on agricultural education were more likely to establish agribusiness ventures within three years of graduation.
- iii **Market Access:** Challenges in accessing competitive markets affect the profitability of agribusiness ventures. Studies indicate that youth-led agribusinesses struggle with supply chain inefficiencies, pricing volatility, and inadequate marketing knowledge. Banjo et al. (2017) emphasizes the need for training programs that incorporate agribusiness marketing and digital sales strategies to improve market access for young entrepreneurs.
- iv **Technological Adoption:** The adoption of modern agricultural technologies, such as precision farming and agritech solutions, has been identified as a key driver of youth engagement in agripreneurship. Banjo and Nosiru (2018) advocate for the integration of digital agricultural technologies in vocational training programs, noting that exposure to technology-driven agribusiness models increases youth interest and participation in the sector.

Agricultural Education and Training including Classroom Engagements

Agricultural education in Nigeria plays a crucial role in preparing young people with essential skills in farming techniques, agribusiness, and resource management. This education not only boosts food production but also helps alleviate poverty and promotes development in rural areas. However, there are significant challenges to overcome, such as limited funding, outdated curricula, a shortage of qualified teachers, and inadequate infrastructure, especially in rural schools (Olorundare, & Kayode, 2014). Additionally, the lack of hands-on training and exposure to modern farming technologies makes it even harder for this education to be truly effective (Azuka, 2017).

Teachers and the classroom play a pivotal role in the training of students. While many teachers will not ask themselves about how far they have succeeded in teaching and learning, the



students are also complacent with the little they have received during classroom engagements. Majority of students in our Nigerian schools are often happy with weak teachers of agriculture that often begins and ends teaching and learning at theoretical level rather than involving them in practical engagements. The cumulative effects of poor engagements often lead to students who believe in reading agriculture to pass exams rather than practicability to prepare them for the world of work in related fields of agriculture.

Success in agriculture begins with the will of the teacher to properly educate and efficiently train the students for proper vocational developments. Agripreneurship development begins from the classroom with a good teacher that is able to utilize appropriate students-centered classroom engagements to provide appropriate knowledge, skills and right attitudes with desired learning experiences. One of the most effective ways to enhance the impact of agricultural education and foster sustainable agripreneurship is through appropriate classroom engagement. To an agriculture teacher, a classroom is not just a room; but a dynamic learning environment where students explore agriculture, food, and natural resources, developing skills in science, math, communication, and leadership. This approach encompasses formal and informal learning environments, including school classrooms, laboratories, demonstration farms, agribusiness incubators, vocational training centers, excursion sites and community-based agricultural programs. Traditional agricultural education models have largely focused on theoretical knowledge, often at the expense of practical and entrepreneurial skill development (Ajani et al., 2015 & Banjo, 2006). However, contemporary approaches such as experiential learning, problem-based instruction, cooperative vocational agriculture, and digital education have shown remarkable success in preparing students for real-world agribusiness challenges (Banjo, 2006, Kolb, 2014; Oloruntoba & Ajibefun, 2022).

All said and done, the way the teachers teach agriculture will determine students' interest in food production and agripreneurship. Appropriate agricultural education and training breeds future agripreneurs while inappropriate agricultural education and training breed graduates without appropriate entry level skills in the world of work. It survives to say teachers and inefficient classroom engagement is a leading cause to a decline in food production as majority of the youths hardly go into agricultural businesses.



The need for Paradigm Shifts in Agricultural Education to Boost Production rather than emphasis on Theory

In Nigeria and many African countries, agricultural education is heavily focused on theoretical knowledge, often neglecting the practical skills needed for modern farming (Eze & Okonkwo, 2023). Most agricultural science curricula emphasize textbook learning, outdated methodologies, and examinations, with limited field exposure for students. A study by the Nigerian Educational Research and Development Council (NERDC, 2024) found that 70% of agricultural education in Nigerian secondary schools is theoretical, with practical activities making up less than 30% of total instructional time. This discrepancy results in graduates who lack the hands-on experience necessary for effective agricultural production and agripreneurship development.

Furthermore, most universities and colleges offering agricultural programs have limited access to functional demonstration farms, agribusiness incubation centers, and mechanized farming tools (Ogunlade et al., 2024). Without adequate exposure to practical farming, students graduate with insufficient skills to contribute effectively to agricultural production.

The overemphasis on theory has contributed significantly to low productivity in the agricultural sector. Nigeria, despite its vast arable land and favorable climate, continues to experience low agricultural output. According to the Food and Agriculture Organization (FAO, 2024), Nigeria's agricultural productivity lags global standards, with yields for key crops such as maize, rice, and wheat being 30–40% lower than those of leading agricultural economies. This decline is attributed to the inability of farmers and graduates to adopt modern farming techniques, mechanization, and climate-smart agricultural practices (World Bank, 2024).

A 2024 survey by the National Bureau of Statistics (NBS) found that only 28% of Nigerian farmers have formal agricultural education, and among them, less than 10% engage in mechanized farming or precision agriculture techniques (NBS, 2024). The limited integration of practical learning in agricultural education means that graduates often lack the competence to improve farm productivity, access agricultural financing, or manage agribusiness enterprises effectively (Akinyemi & Yusuf, 2024). To bridge the skills gap and enhance agricultural production, a paradigm shift towards practical-oriented agricultural education is essential. This transformation requires several key changes:

1. Integration of Hands-On Learning and Field Training
2. Adoption of Smart Agricultural Technologies
3. Industry Collaboration and Work-Based Learning
4. Entrepreneurial and Business-Oriented Agricultural Training



5. Policy Reforms and Curriculum Overhaul
6. Cooperative Vocational Agricultural Education

1. Integration of Hands-On Learning and Field Training

Agricultural education should incorporate more experiential learning, including on-farm training, agribusiness incubation, and collaboration with commercial farms. Countries like Israel and the Netherlands have successfully implemented field-based learning models, where students spend a significant portion of their studies in real-world farming environments (FAO, 2024). A practical approach will allow students to develop competencies in mechanized farming, irrigation techniques, soil fertility management, and post-harvest processing, thereby improving overall agricultural productivity (Olaniyi & Adekunle, 2024).

2. Adoption of Smart Agricultural Technologies

With the rapid advancement of agricultural technologies, educational institutions must integrate precision agriculture, drone technology, greenhouse farming, and digital extension services into their curricula. Studies have shown that students exposed to agricultural technology during training are more likely to engage in modern farming and agribusiness ventures (Ogunbanjo & Oladipo, 2024). Countries like Kenya and Rwanda have established agricultural innovation hubs, where students learn how to use mobile apps for farm management, remote sensing for soil analysis, and automated irrigation systems (African Development Bank, 2024). Nigeria can adopt similar strategies to equip students with relevant technological skills.

3. Industry Collaboration and Work-Based Learning

A strong partnership between universities, research institutions, agribusiness firms, and commercial farms is crucial for developing industry-ready agricultural professionals. In developed economies, agricultural education integrates apprenticeships, internships, and mentorship programs that connect students with industry experts (FAO, 2024). For instance, in China, agricultural colleges have mandatory farm attachment programs, where students spend one year working on commercial farms before graduation (World Bank, 2024). Implementing similar work-integrated learning models in Nigeria will help bridge the gap between theory and practice.

4. Entrepreneurial and Business-Oriented Agricultural Training

Beyond farming skills, agricultural education should emphasize agribusiness development, financial management, and market linkages. Many young graduates lack the business acumen to turn their knowledge into profitable ventures, resulting in a low level of youth participation in agriculture (Ekundayo & Bello, 2024).



In Uganda, agricultural universities offer business incubation programs, where students receive funding, mentorship, and market access support to develop agribusiness start-ups (African Union, 2024). Establishing similar agripreneurship training centers in Nigeria can empower young graduates to create sustainable employment opportunities in agriculture.

5. Policy Reforms and Curriculum Overhaul

To implement these changes, Nigeria must review its agricultural education policies and redesign curricula to reflect modern agricultural trends. The Federal Ministry of Agriculture and Rural Development (FMARD), in collaboration with the Federal Ministry of Education, should mandate a minimum of 50% practical content in agricultural courses at all levels of education (FMARD, 2024). Additionally, funding for university-based research and extension services should be increased to enable institutions to develop innovative agricultural solutions tailored to local needs (World Bank, 2024). Vocational Agricultural Education as a Guide to the Teacher of Agriculture.

Cooperative Vocational Agricultural Education (CVAE)

Cooperative vocational agricultural education combines practical, hands-on training with agricultural knowledge, aiming to equip individuals with skills for farming and related businesses, while also fostering community development through cooperative models. While vocational agriculture involves practical involvement in farming activities, teaching students how to operate farms and manage agricultural businesses, agricultural education focuses on acquiring knowledge and skills in agricultural science, with the goal of improving productivity. Cooperative education approach emphasizes learning through collaboration and joint efforts, often involving community members and local organizations.

Therefore, cooperative vocational agricultural education combines the practical aspects of vocational agriculture with the knowledge and skills of agricultural education, while also incorporating the cooperative model of learning and community involvement. The key aspects and benefits include practical skills development where students gain hands-on experience in farming techniques, crop management, livestock care, and other agricultural practices. Students also gain knowledge as they learn about agricultural science, including plant and animal sciences, soil science, and sustainable resource management.

The CVAE curriculum often includes business management, marketing, and financial literacy to prepare students for running their own agricultural businesses. Cooperative models foster collaboration and community involvement, allowing students to learn from experienced farmers and participate in local agricultural initiatives. By equipping individuals with the skills



and knowledge needed for success in agriculture, cooperative vocational agricultural education can contribute to job creation and economic development in rural areas leading to improved agricultural practices and productivity can contribute to food security and sustainable food systems.

Rural Development is also an attribute of CVAE by empowering local farmers and promoting sustainable agricultural practices. Cooperative vocational agricultural education can contribute to the overall development of rural communities.

CVAE is not merely a teaching framework, it is a revolutionary playbook for Nigerian teachers to ignite agripreneurship among our youth, transforming agriculture from a struggling sector into a powerhouse of innovation and sustainability. In a nation where agriculture employs over 70% of the rural workforce yet contributes only 21% to GDP (National Bureau of Statistics, 2024), and where youth unemployment festers at 33.3% (NBS, 2023), the stakes are high. Traditional education has failed to bridge this gap, churning out graduates who shun farming for urban mirages. VAE, however, offers a bold antidote a set of principles that empower teachers to mold students into problem-solvers, innovators, and stewards of a sustainable future. Here's how these principles can guide us, backed by evidence and a vision for Nigeria's agricultural renaissance.

Learning by Doing: From theory to Action

The heart of agripreneurship development lies in its insistence on experiential learning students don't just memorize planting cycles; they dig into the soil, budget for seeds, and sell their harvest. This isn't optional it's essential. Research shows hands-on training boosts retention by 75% over lectures alone (Kolb, 2014), and in Nigeria, where 95% of farming is rain-fed and vulnerable (ISS African Futures, 2025), practical skills are survival skills. Imagine a classroom where students manage a small poultry unit, calculating feed costs and market prices. At Tai Solarin University of Education, our Centre for Vocational training and entrepreneurship project saw 300 students produce 2 tons of catfish in 2024, generating N4.8 million (TASUED, 2025). Teachers must embrace this principle, turning classrooms into living laboratories where youths master agriculture through action, not just notes, preparing them to lead a sector crying for productivity.

Problem-Solving: Building Resilience Through Real Challenges

Agriculture isn't a textbook exercise, it's a battlefield of soil erosion, erratic rains, and market fluctuations. VAE equips teachers to train students as warriors in this fight, tackling real-world problems with grit and ingenuity. In Kwara State, secondary students on school farms addressed yam spoilage by experimenting with low-cost storage, cutting losses by 30% (Kwara



State Ministry of Agriculture, 2023). This mirrors global successes like India's Agripreneurship Programme, where youths reduced post-harvest waste by 25% through practical training (Sharma & Singh, 2022). Teachers must guide students to wrestle with Nigeria's realities desertification in the north, flooding in the south fostering a resilience that turns obstacles into opportunities, a skillset vital for agripreneurship in a climate-stressed world.

Sustainability Focus: Balancing Profit with Planetary Health

Sustainability isn't a buzzword it's the backbone of Nigeria's agricultural future. VAE demands teachers instil eco-friendly practices crop rotation, organic farming, drip irrigation that ensure long-term viability. With soil degradation affecting 60% of farmland (World Bank, 2024) and food imports at \$5 billion annually, we can't afford waste. The Green Imperative Project (2024) shows climate-smart methods can lift yields by 20% (African Development Bank, 2024); teachers must bring this into classrooms. Picture students testing biofertilizers on a school plot, cutting chemical use while boosting output. This principle aligns with the UN's Zero Hunger goal (United Nations, 2023) and NATIP's productivity targets (FMARD, 2021), positioning youths as guardians of both profit and planet a dual legacy Nigeria desperately needs.

Entrepreneurial Mindset: Unleashing Innovation and Ambition

VAE isn't about farming as a chore it's about farming as a venture. Teachers must cultivate risk-taking and creativity, showing students how to turn yam into exportable flour or cassava into garri for global markets. In Lagos State University's Agripreneurship Club, students generated N5 million from cassava processing in 2024, employing 20 peers (LASU, 2024). This echoes the Tony Elumelu Foundation's success, supporting 1,000 agripreneurs by 2025 (TEF, 2025). Teachers can spark this mindset with business simulations or guest lectures from icons like Farmcrowdy's founders, shattering the stigma that agriculture is dead-end. In a nation where 63.9% of youths lack jobs (Bizcommunity, 2023), this principle turns classrooms into incubators of economic independence, aligning with NATIP's vision of doubling output through innovation. Onyeka Akumah is the Co-Founder and Chief Executive Officer of Farmcrowdy – a start-up he founded in September 2016 and is referred to as Nigeria's first Digital Agriculture platform.

Community-School Relationship Strategy

To successfully implement community-school agripreneurship, key stakeholders, including educational institutions, government agencies, local farmers, and agribusiness investors, must collaborate. A critical step is curriculum reform, where at least 50% of instructional time should



be allocated to practical farming and agribusiness activities (FMARD, 2024). Schools should establish demonstration farms, aquaculture projects, and processing units to provide hands-on learning experiences for students. Additionally, training modules should incorporate agro-processing, marketing, financial literacy, and ICT-based agriculture (Akinyemi & Yusuf, 2024). Government and private sector support are also vital; the government should provide grants, infrastructure, and policy support, while public-private partnerships (PPPs) can connect students with mentors, seed funding, and market opportunities (World Bank, 2024). Agricultural extension services should also engage schools to ensure continuous capacity building.

Another critical strategy is the establishment of agribusiness incubation centers in schools. By partnering with local cooperatives and research institutions, schools can create hubs that offer training in areas like poultry farming, hydroponics, and food processing (FAO, 2024). Such initiatives have proven successful in countries like Uganda, where youth-led agribusiness start-ups increased by 30% within five years (African Union, 2024). Furthermore, encouraging the adoption of modern agricultural technologies, such as drones for farm monitoring and mobile apps for market access, is crucial. In Rwanda, the "Smart Agriculture Schools" initiative resulted in a 25% reduction in post-harvest losses (AfDB, 2024), demonstrating the potential impact of technology-driven agripreneurship.

Vocational Agricultural Education (VAE) thrives on connections to local farmers, cooperatives, and businesses. Teachers must forge these links, bringing mentors into lessons and students into fields. The Fadama GUYS program trained 455 youths by 2024, leveraging farmer partnerships to boost maize yields (World Bank, 2024). At TASUED, our beekeeping unit collaborates with local apiaries, enhancing pollination and student learning (TASUED, 2025). This principle root education in relevance; students learn market demands from traders, sustainable practices from elders, and technology from agribusinesses. It's an ecosystem approach, amplifying classroom impact and ensuring youths don't just study agriculture they live it, ready to transform rural Nigeria.

The Teachers Role: Architect of a Youth-Driven Sector

Teachers wielding these principles aren't just instructors they're architects of Nigeria's future. By blending action, problem-solving, sustainability, entrepreneurship, and community ties, they can reshape how youths see agriculture from a backbreaking burden to a vibrant, sustainable career. The evidence is undeniable: where VAE is applied, results follow 1,500 youths trained by YADIS since 2022 (AGRA, 2022), millions in revenue from student projects, and a 40% rise in youth interest (NBS, 2024). As Nigeria grapples with food insecurity for 33



million (Humanitarian Action, 2024) and oil dependency, this approach aligns with our need for a productive, youth-driven sector. Teachers must lead this charge, armed with VAE's playbook, to cultivate agripreneurs who don't just farm they innovate, sustain, and prosper.

Principles for effective classroom engagements to foster agripreneurship skills development

The principles of agripreneurship in agricultural programmes are hinged on the principles of cooperative vocational agricultural education. The principles imply breaking down the barriers between classroom and industry, which will contribute to increase the relevance and flexibility of successful production skills in agricultural occupation. From the efforts of Prosser and Quigley (1949) in vocational education, Banjo (2006) developed the principles of cooperative vocational agricultural education which is a synonym to agripreneurship as follows:

- Agricultural education will be efficient in proportion as the environment in which the learner is trained is a replica of the environment in which he must subsequently work.
- Effective agricultural training can only be given where the training jobs are carried out in the same way, with the same operations, the same tools and the same machines as in the agricultural occupation itself.
- Agricultural education will be effective in proportion as it trains the individual directly and specifically in the thinking habits and the manipulative habits required in the occupation itself.
- Agricultural education will be effective in proportion as it enables each individual to capitalize his or her interests, aptitude and intrinsic intelligence to the highest possible degree.
- Effective agricultural education for any occupation or job can only be given to the selected group of individuals who need it, want it, and are able to profit by it. Agricultural training will be effective in proportion as the specific training experiences for forming right habits of doing are those of the finished skills necessary for gainful employment. Agricultural education will be effective in proportion, as the instructor has had a successful experience in the application of skills and knowledge to the operations and processes, he undertakes to teach.
- For every agricultural occupation, there is a minimum of productive ability which an individual must possess in order to secure or retain employment in that occupation. If the education is not carried to that point with that individual, it is neither personally or socially effective.



- Agricultural education must recognize conditions as they are and must train individuals to meet the demand of the market even though it may be true that more efficient ways of conducting the occupation may be known and that better working conditions are highly desirable.
- The effective establishment of process habits in any learner will be secured in proportion as the training is given on actual jobs and not on exercise or pseudo jobs
- The only reliable source of content for specific training in agricultural occupation is in the experience of masters of the occupation.
- For every agricultural occupation, there is a body of content which is peculiar to the occupation and which practically has no functioning value in any other occupation.
- Agricultural education will render efficient social service in proportion as it meets the specific training needs of any group at the time, they need it and in such a way that they can most effectively profit by the instruction.
- Agricultural education will be socially efficient in proportion as in its methods of instruction and its personal relations with learners it takes into consideration the particular characteristics of any particular group, which it serves
- The administration of agricultural education will be efficient in proportions as it is elastic and fluid rather than rigid and standardized.
- While every reasonable effort should be made to reduce per-capita cost, there is a minimum below which effective agricultural education cannot be given, if the course does not permit of this minimum of per capita cost, vocational education should not be attempted as a vocation.

Students for cooperative agricultural occupational education are to be recruited based on their interest. In consonance to this, Okorie in Banjo (2006) affirms that agricultural occupation should be meant for those who want it, need it and ready to profit by it. Banjo (2006) therefore advised that the teacher coordinator when recruiting students for cooperative agricultural education programme should find those students who can profit from what he believes his instruction has to offer.



Anticipated dividends of agripreneurship among youth

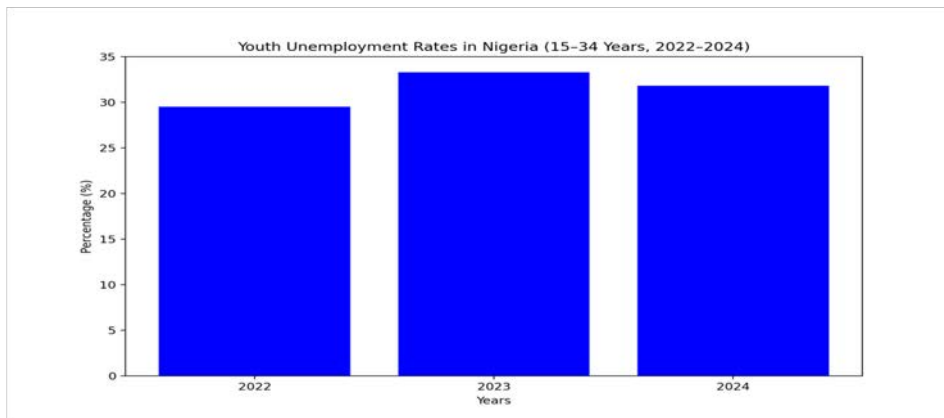


Fig 2: A bar graph illustrating youth unemployment rates (15–34 years) from 2022 to 2024, sourced from NBS (2023, 2024), showing a peak

Agricultural Employment Share in Nigeria (2013–2022)

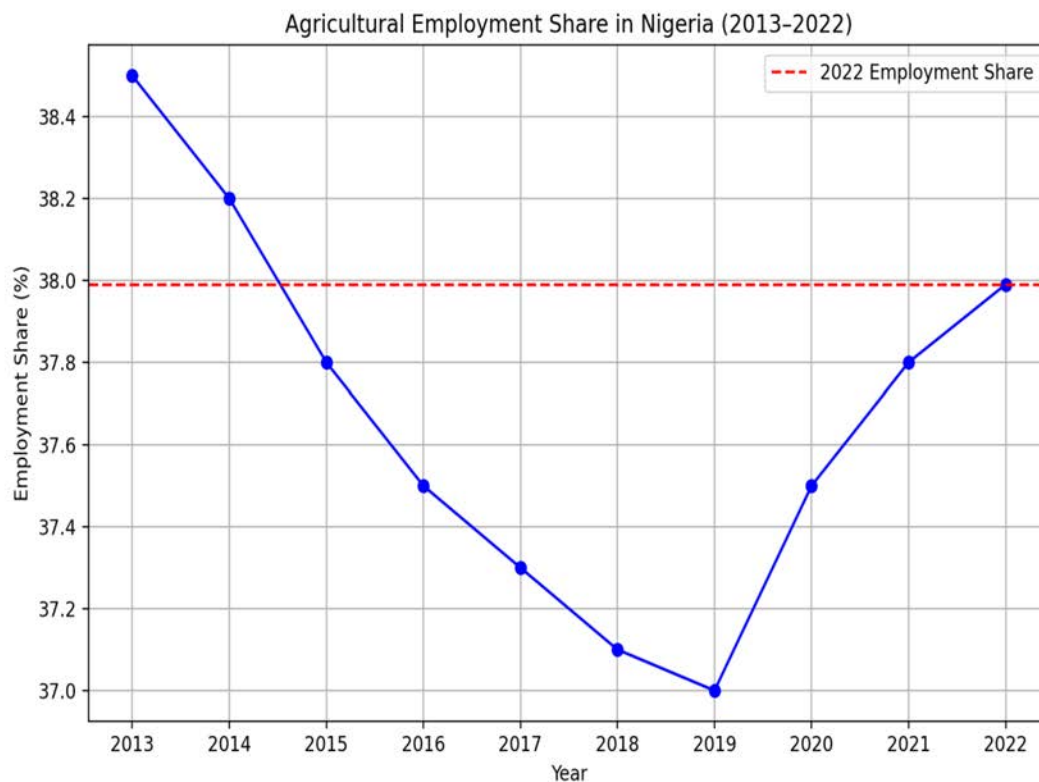


Fig 3: A line graph showing the agricultural sector's employment share. It shows a slight decline in the employment share over the years, with a notable value of 37.99% in 2022, highlighted by a dashed red line, sourced from World Bank (2024), highlighting the need for education to retain youth interest



Conclusion

Agripreneurship among youth is a vital component for fostering economic growth, enhancing food security, and promoting sustainable agricultural practices in Nigeria. Effective classroom engagement in agricultural education can play a significant role in equipping young people with the necessary skills, knowledge, and entrepreneurial mindset to thrive in the agricultural sector. However, to realize the full potential of agripreneurship, it is essential to address the existing challenges in agricultural education and create an environment that encourages innovation, practical learning, and collaboration.

Recommendations for Effective and Efficient Agripreneurship Among Youth

1. Curriculum Enhancement

Revise and update the agricultural education curriculum to include modern agribusiness practices, sustainable farming techniques, and the use of technology in agriculture. Ensure that the curriculum is relevant to current market demands and local agricultural contexts.

2. Practical Learning Opportunities

Incorporate hands-on learning experiences through school farms, internships, and partnerships with local agricultural businesses. This will allow students to apply theoretical knowledge in real-world settings and gain practical skills.

3. Entrepreneurship Training

Integrate entrepreneurship education into the agricultural curriculum. Teach students about business planning, financial management, marketing strategies, and the importance of innovation in agribusiness.

5. Use of Technology

Leverage technology in teaching and learning processes. Introduce students to digital tools and platforms that can enhance agricultural productivity, such as precision farming, mobile applications for market access, and data management systems.

5. Collaboration with Industry

Foster partnerships between educational institutions and agricultural industries. Engage industry professionals as guest lecturers, mentors, or internship providers to bridge the gap between education and practical application.

6. Access to Funding and Resources

Create programs that provide access to funding, grants, and resources for young agripreneurs. This could include microfinance initiatives, scholarships for agricultural studies, and support for startup agribusinesses.

7. Promotion of Agripreneurship Competitions

Organize agripreneurship competitions and innovation challenges to encourage creativity and problem-solving among students. These competitions can help identify and support promising agribusiness ideas.

8. Awareness Campaigns



Conduct awareness campaigns to promote the value of agripreneurship among youth and communities. Highlight success stories of young agripreneurs to inspire and motivate others to pursue careers in agriculture.

9. Mentorship Programs

Establish mentorship programs that connect students with experienced agripreneurs and agricultural professionals. Mentorship can provide guidance, support, and networking opportunities for aspiring young farmers and agribusiness owners.

10. Focus on Sustainability

Emphasize sustainable agricultural practices in the curriculum and classroom activities. Teach students about environmental stewardship, resource management, and the importance of biodiversity in agriculture.

11. *Government Support and Policy Framework*:

- Advocate for supportive government policies that promote agripreneurship among youth. This includes creating an enabling environment for agribusiness, providing incentives for young farmers, and investing in agricultural education.

Final Thoughts

By implementing these recommendations, educational institutions can play a pivotal role in nurturing a new generation of agripreneurs who are well-equipped to tackle the challenges of the agricultural sector. This will not only contribute to individual economic empowerment but also enhance the overall development of Nigeria's agricultural landscape, ensuring food security and sustainable livelihoods for future

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BOOK OF ABSTRACTS

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Innovations in Sustainable Agriculture and Environmental Conservation: A Paradigm Shift Towards Eco-Friendly Farming Practices

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Abstract

The world is facing unprecedented environmental challenges, including climate change, deforestation, and water pollution, which threaten the sustainability of agricultural systems. In response, innovations in sustainable agriculture and environmental conservation have emerged as a critical paradigm shift towards eco-friendly farming practices. This paper examined the current state of knowledge on innovations in sustainable agriculture. It also discussed the role of environmental conservation in promoting sustainable agriculture, including the use of conservation agriculture, crop rotation, and cover cropping. The review revealed that innovations in sustainable agriculture and environmental conservation can improve crop yields, reduce greenhouse gas emissions, and promote biodiversity. However, the paper revealed several challenges and limitations to the adoption of these innovations, comprising lack of access to credit, limited technical expertise, and inadequate policy support. To address these challenges, the paper proposed a framework for promoting innovations in sustainable agriculture and environmental conservation, which include capacity building, policy support, and market incentives.

Keywords: Innovations, Sustainable Agriculture, Environmental Conservation, Eco-friendly Farming



Innovations in Sustainable Agriculture and Environmental Conservation: Pathways to A Resilient Future

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Abstract

The dual crises of climate change and environmental degradation have placed immense pressure on agricultural systems worldwide. The urgency to innovate within sustainable agriculture and ecological conservation is more critical now than ever. This paper explored transformative practices, technologies, and policies integrating ecological balance with agricultural productivity. The paper emphasized innovations in precision farming, regenerative agriculture, biotechnology, agroforestry, vertical farming, integrated pest management (IPM), soil microbial technology, aquaponics and hydroponics, renewable energy integration, and digital agriculture platforms. The paper also highlights collaborative frameworks and policy mechanisms that promote global scalability and adaptation. The paper recommended that a sustainable path should be charted by leveraging these innovations to ensure food security and ecosystem health for future generations.

Keywords: Innovations, Sustainable Agriculture, Environmental Conservation, Resilient Future



Integration of Artificial Intelligence in the Curriculum of Agricultural Education for Productivity

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Abstract

This study investigated the integration of artificial intelligence (AI) in the curriculum of agricultural education for productivity. Four research questions were developed and answered by the study while four null hypotheses were formulated and tested. Descriptive survey research design was adopted for the study. The population for the study was 51 people which was also the sample for the study. A 38-item structured questionnaire was developed for data collection and was validated by seven experts. Cronbach alpha method was used to determine the reliability coefficient of the items. The researchers administered and collected copies of the questionnaire with the help of five research assistants. The data collected was analyzed using mean to answer the research questions and independent t-test to test the null hypotheses at 0.05 level of significant. The findings of the study revealed that all the 38 items were required for integration into the curriculum of agricultural education. The study also found that there was no significant difference in the mean responses of female and male agricultural lecturers on each item of the content to be integrated into the curriculum of agricultural education. The study recommended among others that the curriculum should include foundational courses in AI, machine learning, and data analytics tailored specifically to agricultural applications.

Keywords:



Precision Agriculture in Nigeria: A SWOT Analysis

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Abstract

Precision agriculture (PA) is a modern farming approach that uses information technology to optimise resource allocation and enhance crop productivity. The adoption of PA in Nigeria has been limited due to various challenges, yet the strengths and opportunities are still unknown. This study analysed the strengths, weaknesses, opportunities, and threats (SWOT) of PA in Nigeria and provide recommendations for its development and implementation. The study uses document and thematic analysis method to identify and categorise the SWOT factors of PA in Nigeria. The study finds that PA has several strengths, such as increasing crop yields, reducing input costs, improving environmental quality, and enhancing food security. Nevertheless, PA also faces several weaknesses, such as high costs, lack of awareness, limited access, inadequate infrastructure, lack of government support, and resistance to change. The study also identifies several opportunities for PA development and adoption in Nigeria, such as growing demand for food, availability of technology and data, potential for innovation and collaboration, and favourable policies and regulations. Notwithstanding, PA also encounters several threats, such as competition from other countries, security and privacy issues, ethical and social concerns, and climate change effects. The study concludes that PA has great potential to improve the performance and sustainability of the agricultural sector in Nigeria if the challenges are addressed and the opportunities are exploited. Based on the SWOT analysis, the study provides recommendations for different stakeholders involved in PA in Nigeria, such as farmers, extension agents, policy makers, researchers, and service providers.

Keywords: Precision Agriculture, SWOT Analysis, Narrative Analysis, Nigeria.



Developing the Future Workforce through Problem-Based Learning and Entrepreneurship Education in Nigerian Tertiary Institutions

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Abstract

This study examined how Nigerian tertiary institutions can develop the future workforce through the application of problem-based learning and entrepreneurship education (EE) in their respective institutions. The study adopted qualitative interviews with 31 experienced higher education academics, executives of employment and work placement agencies in Nigeria. The respondents highlighted the substantial benefits of adopting entrepreneurial pedagogies and problem-based learning. The findings revealed that entrepreneurship education and problem-based learning could be powerful teaching approaches that can be used to enhance students' interests in transitioning from school to the world of work. It concludes that increasing students' knowledge and cognitive learning, innovation in teaching pedagogy, change of thinking, change of attitudes of teachers and learners, social learning and change of action can enhance higher education graduates' interests and competencies in entering the workforce.

Keywords: Entrepreneurship, Education, Problem-Based Learning, Workforce Tertiary Institution.



Agricultural Development in Nigeria: A Legal Perspective

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Abstract

Agriculture plays a crucial role in the Nigerian economy, employing a significant portion of the population and contributing to food security, poverty reduction, and economic development. Recognizing the importance of the agricultural sector, Nigeria has implemented various policies and regulations to support and regulate agricultural activities in the country. This article provides an in-depth overview of agricultural policies and regulations in Nigeria, highlighting their objectives and key initiatives. Through a doctrinal research method, the paper reviewed the legal framework on agricultural development and takes on the challenges that impede a beneficial agricultural scheme in Nigeria. It attempts an analysis of the failure of a proper connection with the opportunities of the African Continental Free Trade Agreement and how it may affect the economy of Nigeria. The paper attempts a comparative analysis on the model of laws in select jurisdictions that support the agricultural sector and makes recommendations for a viable model in Nigeria. The paper concluded that a functional policy/legal framework is essential for a viable agricultural sector. It was recommended that the Nigerian legal system should be strengthened to facilitate stakeholder activities in the agricultural value chain.

Keywords: Agriculture, Agricultural Development, Food Security, Legal Perspectives.



Challenges to Indigenous Climate Change Adaptation Practices by Farm Households in Udi Local Government Area, Enugu State

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Abstract

The paper determined the indigenous climate change adaptation practices and challenges among farm households in Udi Local Government Area, Enugu State, Nigeria. The study utilized descriptive survey research design and two research questions guided the study. Questionnaire was used to collect information from 387 sampled farmers from the study area. The instrument was validated by three experts from the department of Agricultural Education. Reliability was determined using Cronbach alpha which yielded the co-efficient of 0.77. Data obtained were analyzed using mean and standard deviation. The study found out among others that traditional weather forecasting, use of mulching materials, use of mixed cropping amongst others are indigenous climate change adaptation practices utilized by farm household and lack of sufficient information available about indigenous climate adaptation practices and challenges includes; lack of awareness from community members, non-acceptance of indigenous climate change adaptation practices among others. The paper recommended, amongst others, that teachers and educational institutions should integrate indigenous climate change adaptation practices into school curricula to equip students with practical knowledge on climate resilience; ensuring future generations are well-prepared to tackle climate challenges.

Keywords: Climate Change, Indigenous Adaptation, Practices, Farm Households.



Analysis of Mass Media Utilization Among Maize Farmers in Funakaye Local Government Area, Gombe State

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Abstract

The study examined the analysis of mass media utilization among maize farmers in funakaye local government area of Gombe state. The objectives of the study were to identify the socio-economic characteristics of the farmers in the study area, identify the sources of agricultural information use by the farmers, determine the advantage associated with use of mass media perceived by farmers, determine the constrain associated with the use of mass media by farmers. One hundred and twenty (120) maize farmers were randomly selected for the study. Data were collected using structural questionnaire, internet, etc., and analyzed using descriptive statistics (frequency, percentage). The finding of the study showed that 32% of the respondents were age between 31-40 years. 33.4% were married, 39.1% of the respondents have western education and 62.5% were male, 37.5% of them practices agriculture on 1-1½ hectare which show they are small scale farmers. The result shows that 37.5% of them received their agricultural information from the mass media through radio and television, 8.3% received their information through extension agencies, 41.6% of the respondent mass media influence their traditional farming through control of disease and pest increase in yield and 15% also gain through availability of fertilizer. 26.7% lack information needed from mass media this is as a result of inefficient use of mass media by the extension agent, 23.3% of the respondent have high network problems in the study area. The major constrain face by the farmers in the study area are inadequate information from mass media, poor network, unstable power supply. Government and private sector, Extension agents, researchers and others in the agricultural sector should make efforts in disseminating more agricultural information to farmers through mass media.

Keywords: Utilization, Mass Media, Maize, Farmers. Mass Media Utilization.



Effect of Different Growing Media on the Growth and Yield Performance of Two Varieties of Okra Grown in Bags

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Abstract

This study examined the effects of different growing media on the growth and yield of two okra varieties. White Velvet and Ex-Borno were cultivated in bags using three different media combinations: (1) topsoil + poultry manure + river sand, (2) rice husk + poultry manure + river sand, and (3) rice husk + poultry manure. A 2 × 3 factorial experiment was conducted in a Completely Randomized Design (CRD) with three replicates. Various growth and yield parameters were assessed. The results indicated that the topsoil + poultry manure + river sand mixture consistently promoted the best growth and yield in both okra varieties. This medium produced significantly ($p < 0.05$) superior morphological traits compared to the other two combinations. Plants grown in this medium exhibited the greatest plant height (18.53 cm), stem girth (10.65 cm), and stem diameter (1.70 cm), which are essential for photosynthesis and nutrient transport. Among the varieties, White Velvet showed superior vegetative growth and seed yield, whereas Ex-Borno produced larger and heavier fruits. The rice husk + poultry manure medium resulted in the lowest yields due to its limited nutrient retention. The study highlights the critical role of growing medium composition in okra production, with the topsoil-based mix being the most effective. Based on these findings, White Velvet is recommended for farmers aiming for higher vegetative growth and seed yield, while Ex-Borno is more suitable for markets that prioritize fruit size and weight. This research underscores the potential of bag-based cultivation and offers practical strategies for enhancing okra productivity through optimized growing media.

Keywords: Okra, Varieties, Poultry Manure, Media and Yields.



Branding Awareness and Challenges in Agribusiness: An Exploratory Analysis Among Agricultural Education Students at University of Nigeria Nsukka

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Abstract

As competition increases in the Agribusiness sector, strong branding has become crucial for success in every agribusiness entrepreneur's business. However, many small-scale agribusiness entrepreneurs remain unaware of the importance and benefits of business branding, thereby limiting their business growth. Agricultural Education students in Nigeria - the Future of Agribusiness - are expected to develop branding competence. Unfortunately, they may still face the same branding challenges as current small-scale agribusiness owners. Adopting a descriptive survey approach, this study explores branding awareness, perception, and challenges among Agricultural Education students at University of Nigeria Nsukka. Data were collected using a structured questionnaire administered to over 40 students via online and physical form distribution. The study employed descriptive statistics to analyze branding awareness levels and thematic analysis to categorize common branding challenges faced by students. Preliminary findings indicate that while students recognize the importance of branding, their practical knowledge is limited, and they face challenges such as limited financial resources, lack of branding education, difficulty leveraging digital branding tools and techniques, and limited access to branding mentorship. This study highlights the need to integrate branding education into Agricultural Education programs, organize practical branding workshops, provide open access to resources, tools, techniques, and strategic mentorship programs between students and agribusiness professionals to enhance branding knowledge, skills, and experience. By implementing these strategies, future agribusiness professionals will be better equipped to create strong brands and successfully position their businesses for visibility, growth, and profitability in Nigeria's agribusiness sector and beyond.

Keywords: Branding Awareness, Agricultural Education, Agribusiness Challenges, Agricultural Entrepreneurship, Agribusiness Training.



Effects of Concentration Rates of Moringa Leaf Extract on Velvet bean Caterpillar in Groundnut Plant Under Sack Technology in University of Nigeria Nsukka

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Abstract

This study determined the effect of different concentration rates of moringa leaf extract on velvet bean caterpillars in groundnut plants under sack technology in University of Nigeria Nsukka. Three specific objectives and three research questions were adopted to guide the study. The study adopted experimental research design and was carried out at the Agricultural Farm of the Department of Agricultural Education, Faculty Of Vocational and Technical Education, University of Nigeria Nsukka, Enugu State. The population for the study was 96 stands of groundnut plants planted using sack technology. There was no sampling because the entire population was used for the study. The treatment consists of different concentrations of moringa leaf extract (MLE) at the rate of 1L of MLE (200ml), 1L of MLE (150ml) and 1L of MLE (100ml). They were laid in completely Randomized Design with three replications to form 24 bags. The number of affected leaves were counted at 3, 5, and 7 weeks using the counting method and the data collected were recorded in the observation schedule using a book, pencil and pen. Statistical Package for Social Science (SPSS) was used for the data analysis. These findings showed that bags treated with 100ml of MLE have the lesser infestation of velvet bean caterpillar when compared with control. The study showed that (200ml) of MLE and (150ml) of MLE were the best treatment when compared with (100ml) of MLE treatment and control. The researcher concluded that bio pesticides are very effective in the prevention of pests. It was recommended that 200ml of MLE and 150ml of MLE should be used in Nsukka to control the infestation of velvet bean caterpillars of groundnut plants.

Keywords: Moringa Olifera, Extract, Groundnut, Concentration Rates.



Smart Cultural Practices Needed by Farmers in Managing Edaphic Factors for Sustainable Crop Production in Enugu State

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Abstract

The study was carried out to determine the smart cultural practices needed by farmers in managing edaphic factors for sustainable crop production in Enugu State. Four research questions guided the study. Descriptive survey research design was adopted for the study and the study was carried out in Enugu Ezike Agricultural Zone of Enugu state. Enugu Ezike Agricultural Zone was chosen because of the consistent farming practices in the area. The population for the study was 214 farmers consisting of 103 males and 111 females who have their farms scattered within the three local governments area that made up Enugu Ezike Agricultural Zone. The entire population was not studied due to the fact the population is quite much, however, a random sampling technique was used to select a sample of 122 farmers comprising 57 male farmers and 65 female farmers. A questionnaire consisting of 23 items was developed from literature and used as the instrument for data collection. The scale for the questionnaire will be: Highly needed (HN)-4, moderately needed (MN)-3, slightly needed (SN)-2 and not needed (NN)-1. The questionnaire was face validated by three experts from agricultural education department and from crop science department all from University of Nigeria, Nsukka. Cronbach alpha was used to determine internal consistency of the questionnaire which yielded 0.83 coefficients. The questionnaire was administered to 122 respondents (57 male farmers and 65 female farmers) and collected with the help of two research assistants. Mean statistics was used to answer the research questions while t-test statistics was used to test the hypothesis at 0.05 level of probability. The bench mark of 2.50 was used to determine the level of acceptance or otherwise rejection. Any item with a mean score of 2.5 or above was regarded as agree; while any item with mean score below the beach mark was taken as disagree. From the findings of the study, it was recommended among others that farmers should imbibe the smart practices such as crop rotation, mulching, strip cultivation among others. It was therefore concluded that smart cultural practices should be adopted by farmers to improve edaphic factors for sustainable crop production.

Keywords: Smart, Cultural practices, Farmers, Edaphic factors, Sustainable, Crop production.



Gender Issues in Agricultural Education and Entrepreneurship

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Abstract

Women are essential to the advancement of agriculture, yet they continue to face significant gender disparities in education, resources, and entrepreneurial opportunities. This paper delves into the roles women play in agricultural education and entrepreneurship, emphasizing their contributions to innovation, food security, and potential for economic development. Despite their substantial contributions to agricultural productivity and business, women encounter systemic barriers such as limited access to education, funding, technology, and land ownership, hindering full participation in the sector. The study adopts a qualitative approach, relying on secondary data to identify key barriers and opportunities for advancing gender equality in agricultural settings. The study suggests that targeted interventions like mentorship programs, inclusive policies, and gender-sensitive education can empower women in agriculture, enabling them to build resilient agribusinesses and contribute to sustainable food systems. Successful examples of women-led agribusinesses highlight the importance of training, funding, access to technology, and strong market linkages in fostering entrepreneurial success. Addressing gender gaps through tailored policies, multi-stakeholder partnerships, and capacity-building initiatives can unlock the full potential of the agricultural sector, fostering innovation, sustainability, and economic growth. This research offers valuable insights for policymakers, educators, and stakeholders aiming to create an inclusive and equitable agricultural environment that promotes equal opportunities for women. By fostering gender equality, the agricultural sector can drive transformative change and ensure long-term economic resilience, ultimately benefiting society as a whole. Through this research, we aim to inspire meaningful change and advocate for policies that strengthen women's roles in agricultural education and entrepreneurship.

Keywords: Women In Agriculture, Entrepreneurship, Gender Equality, Food Security, Mentorship, Empowerment.



Innovative Teaching Methods for Sustaining Pupils Interest in Agriculture in Primary Schools in Nsukka LGA, Enugu State

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Abstract

The current methods of teaching Agricultural Science to the Primary School pupils have not adequately motivated and sustained their interest in the subject, hence most of the pupils do not continue with Agriculture and related subjects when they go to the higher levels of education. Probably, some negative attitudes like effect of using agricultural activities to punish pupils while they are in primary school may have thwarted their interest in studying agriculture at secondary and university level. This is because for someone to acquire skills, he /she must have conviction that either intrinsically or extrinsically motivation for the future outcomes. This paper therefore examined the innovative teaching methods for sustaining primary school children interest in agriculture science. The paper focused on different types of innovative teaching methods, characteristics and application of different types of innovative teaching methods, challenges that may hinder the adoption of the innovative teaching methods among primary school pupils and possible solution to the challenges that may hinder adoption of innovative teaching methods. The paper noted that applying innovative teaching method will spur the pupil interest towards agricultural science in primary school and subsequently motivate their interest in higher institution. The paper concluded that the need for innovative teaching methods cannot be overemphasized since it has a way of stimulating pupil's interest into learning process. The paper recommended among others that friendly and playful innovative teaching methods should be adopted to in primary schools since that will help and boost their interest in learning.

Keywords: Innovative Teaching Methods, Agriculture, Interest, Primary School Children.



Utilization of Indigenous Knowledge System in Teaching and Learning of Agriculture in Secondary Schools for Sustainable Agriculture and Environmental Conservation

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Abstract

This study investigated the utilization of indigenous knowledge system in teaching and learning of agriculture in the secondary schools for sustainable agriculture and environmental conservation. Specifically, the study determined the indigenous knowledge practices utilized in teaching and learning livestock production, crop production, soil conservation as well as the factors that limit the effective utilization of indigenous knowledge system and the effective strategies for utilization of indigenous knowledge system in teaching and learning of agriculture. The study adopted a survey research design and was carried out in Orumba North local government Area of Anambra State. The population for the study was 60 Teachers of Agriculture in Secondary schools. The structured questionnaire used for data collection was face validated by three experts from the Department of Agricultural Education, University of Nigeria Nsukka and a reliability coefficient of 0.79 was obtained through Cronbach alpha method. It was found that the indigenous knowledge practices utilized by teachers in teaching and learning of agriculture included addition of ashes to the soil, planting of cover crops, use of neem leaves for treating poultry diseases, use of scare crows to control rodent attack, heaping of soil and trash around the crops while weeding, among others. Based on the findings, it was recommended among others that teachers should be trained and re-equipped with relevant indigenous knowledge to improve teaching and learning of agriculture.

Keywords: Utilization, Indigenous Knowledge, Teaching and Learning, Agriculture, Secondary School.



Effect of Pig and Poultry Manure on the Growth and Yield of Tomato in Nsukka, Enugu State

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Abstract

The study determined the effects of pig and poultry manure on the growth and yield of tomato in Nsukka, Enugu State. Six research questions guided the study. The study adopted experimental research design and was carried out in the research farm of Agricultural Education Department, Faculty of Vocational and Technical Education, University of Nigeria, Nsukka. The plants population for the study was 120 while a sample of 60 plants were selected using random sampling technique for the study. The treatments consisted of the application of pig manure and poultry manure which were laid in a Randomized Complete Block design and replicated 3 times to form 6 beds. The growth parameters were collected using counting method and measuring tape at 4th, 6th, and 8th weeks after planting, while the fruit were collected and weighed with a weighing balance after 8th weeks of planting and recorded in the observation schedule. Mean was used for the analysis. The findings showed that plot treated with poultry manure had the higher growth and yield than pig manure and combined application of pig and poultry manure there was a positive effect of poultry manure on the number of leaves, branches, vine length of leaves and fruit of tomato. The study revealed that poultry manure was the better treatment when compared with pig manure. The application of poultry manure had the highest growth parameters. It is recommended that the application of poultry manure and pig manure should be adopted in Nsukka for cucumber production.

Keywords: Tomato, Poultry Manure, Pig Manure.



A Review of Innovations in Youth Engagement and Empowerment in Agribusiness Development in Zango Kataf, Kaduna State

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Abstract

Innovations in youth engagement and empowerment in agribusiness development simply means novel strategies and approaches designed to involve and empower young people in the agricultural sector. This paper addressed the challenges faced by the aging agricultural workforce and to leverage the potential of youth in driving modernization, sustainability, and technological integration in agriculture. A critical issue arises from the increasing age of the agricultural workforce, underscoring the urgent need to involve younger generations. Youth engagement holds promise for innovation, technological integration and sustainable practices that can revolutionize traditional farming. The critical role of youth in driving agricultural transformation and economic growth, emphasizing the need for tailored approaches to address local challenges and opportunities. Studies indicated various strategies that promotes youth involvement in agribusiness, which include education and training programs, access to resources, mentorship and support networks, the use of technology and innovation and that it increases involvement of young people in farming activities like ginger cultivation and processing from 60% to 86.7% of youths in Zango Kataf. However, barriers such as lack access to extension services, limited access to land, funding, alongside broader challenges like climate change and insecurity which limits their participation. Study reviewed that challenges faced by aging workforce can be overcome by fostering public-private partnerships, use of innovations and technology, social media training and mobile application and creating targeted interventions to sustain youth engagement in agribusiness. To achieve sustainable agricultural development, there is need to improve the general outlook of agriculture through innovations and youth engagement.

Keywords: Agribusiness, Innovation, Youths engagement, Kaduna, Zango Kataf.



Essential Entrepreneurial Skills for Effective Business Development and Management in Duck Farming Enterprises in Enugu State

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Abstract

This study determined essential entrepreneurial skills for effective business development in duck farming enterprises in Enugu State. Descriptive survey research design was adopted for the study. Three research questions and three null hypotheses guided the study. The population for the study was 205 made up of 30 lecturers, 110 extension officers and 105 registered duck farmers in Enugu State. The entire lecturers participated because their population was manageable while purposive sampling techniques was used to select 52 extension officers and 48 duck farmers, giving a total sample size of 130. The instrument for data collection was 55-item structured questionnaire developed from literature and was face validated by three experts. Reliability of the instrument was established using Cronbach Alpha, which yielded 0.88 index value. Mean and standard deviation was used to analyze data for answering the research questions while ANOVA statistic was used to test the null hypotheses at 0.05 level of significance at appropriate degree of freedom. The findings of the study revealed that 20 items were identified as entrepreneurial skills required by duck farmers, 20 items on level of entrepreneurial skills acquisition among duck farmers, 15 items on perceived impact of entrepreneurial skills on profitability and sustainability of duck farming for effective business development. It was recommended among others that the identified entrepreneurial skills for effective business development in duck farming should be used by extension officers in training and retraining packages for duck farmers.

Keywords: Duck, Entrepreneurial, Poultry Farmers, Business Development.



Assessing The Anti-Nutritional Composition of Okra at Different Stages of Maturity to Enhance Farmers Profitability in Nsukka Local Government Area of Enugu State

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Abstract

This study assessed the anti-nutritional composition of okra at different stages of maturity to enhance farmers' profitability. Specifically, the study identified and quantified the anti-nutritional compounds present in okra, evaluate how these compounds change across different maturity stages, and determine the stage at which anti-nutritional factors are minimized. To achieve these objectives, an experimental research design was used. The study was carried out at Agricultural Education farm site, University of Nigeria Nsukka. The population for the study was 100 okra stands, purposive sampling technique was used to pick 80 healthy okra planted at the rate of two seedlings per hole. The phyto-chemical analysis was carried out in the Crop Science Laboratory, University of Nigeria, Nsukka for data collection, mean was used to answer the research question. Fresh okra pods were harvested at three distinct maturity stages - early (young pods), mid-maturity, and late maturity. It was found out that there were five major anti-nutrients available in okra such as tannin, phytate, oxalate, alkaloid and saponin. These anti-nutritional compositions were found in the three developmental or maturity stages during harvest of okra saponin begin highest 2.31 at the sixth stage of development (8-10cm) followed by oxalate 2.30, alkaloid 2.26, while tannin and phytate contained 0.36 each. The results also indicated that anti-nutritional factor varied significantly with maturity. It was also observed that, tannins and saponins, which can affect protein digestibility, were more pronounced in mid-mature and late-mature pods. The findings indicate that anti-nutritional compounds vary significantly with maturity, with higher concentrations in immature pods that gradually decline as the fruit matures. The study concludes that identifying the stage with the lowest anti-nutritional content can help farmers harvest at an optimal time, ensuring better market value and nutritional benefits for consumers. These findings provide critical insights for farmers, enabling them to make informed decisions about the ideal harvesting time to improve consumer acceptability and market value. The study recommended that farmers should target the optimal maturity stage to enhance profitability while delivering high-quality product with reduced anti-nutritional content.

Keywords: Anti-nutritional Composition, Okra, Maturity, Farmers, Profitability.



Perception of the Influence of Cooperative Society on Farmers' Income and Productivity in Nsukka Local Government Area

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Abstract

This research evaluated the perception of the influence of cooperative society on farmers' income and productivity in Nsukka Local Government Area, Enugu State. Four research questions guided the study. The study adopted descriptive survey research design. The population of the study was 1800 registered farmers in Nsukka Local Government Area, Enugu State. The sample size for the study was 143 farmers in Nsukka, determined through Taro Yamani model. The respondents were selected through simple random sampling technique. The instrument used for data collection for the study was a well-structured questionnaire. The instrument was face-validated by three experts in Agricultural Education Department, University of Nigeria, Nsukka. The reliability of the instrument was determined using Cronbach Alpha method, which yielded a coefficient value of 0.75, showing that the instrument was reliable. In-person questionnaire distribution using research assistants was employed to administer the instrument on the respondents. Mean score and standard deviation were used to answer the research questions. The findings of the study revealed, among others, that agricultural cooperatives have the potential to enhance farmers' access to essential farm inputs, positively influences income levels by providing better access to credit, markets, and collective bargaining for higher prices, improve farm productivity, fosters knowledge sharing in improved farm management practices and generally offer better experience for improving economic outcomes than non-members. The study concluded by exploring, then exposing the vital roles agricultural cooperatives play in enhancing farmers' income and productivity in Nsukka LGA. Based on the conclusion of the study, it was recommended, among others, that agricultural cooperatives should strengthen their support systems by improving access to high-quality inputs, farm equipment, and storage facilities for members.

Keywords: Cooperative societies, Farmer's income, Productivity, Income, Agriculture.



Gender in Agricultural Education and Entrepreneurship: Bridging Gaps for Sustainable Development

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Abstract

Women play a pivotal role in agricultural education and entrepreneurship, yet they face significant structural and socio-cultural barriers that limit their full participation and impact in the sector. This paper examines the intersection of gender, education, and entrepreneurship in agriculture, highlighting the challenges women encounter, the policies aimed at addressing gender disparities, and the innovations promoting inclusivity. Drawing from empirical studies and global best practices, the paper explores how targeted educational interventions and entrepreneurial opportunities can empower women in agriculture, enhance food security, and drive economic growth. The study recommends strategic policy reforms, enhanced access to finance, and technology-driven solutions to bridge gender gaps in agricultural education and entrepreneurship. By fostering inclusivity and innovation, agricultural systems can be transformed to cultivate future generations of female agripreneurs, contributing to sustainable development in Nigeria and beyond.

Keywords:



Agricultural Entrepreneurship Skills as a Panacea for Enhancing Graduates Self-reliance for National Economic Growth and Sustainable Development in Nigeria

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Abstract

Agriculture has been the backbone of the Nigerian economy and has continued to play a pivotal role in national economic development despite the country's heavy reliance on the oil sector, providing the citizenry with basic needs of life such as food, clothing, and shelter. Sustainable development in the agriculture sector is essential for attaining sustainability in national economic growth and development. Skills development in agricultural education especially in entrepreneurship is essential for graduates' self-reliance and employability. This paper reviewed the role of agricultural entrepreneurship skills development in enhancing graduates' self-reliance and national economic growth. Systematic literature review was conducted using different search engines such as google scholar, PubMed, Research Gate, Springer, and ScienceDirect. Keywords such as agricultural entrepreneurship, agricultural entrepreneurship skills, skills for enhancing graduate's self-reliance, national and economic development, sustainable economic development were used to search for published articles for the review. The review is presented under the following sub-headings: the role of Agricultural Entrepreneurship Skills in enhancing self-reliance, factors militating against entrepreneurship skills development, and the strategies for promoting agricultural entrepreneurship skills development. The review reveals that agricultural entrepreneurship skills promote entrepreneurship intentions among agricultural education graduates. This paper concludes that Agricultural Entrepreneurship Skills is critical to rescue Nigeria from unemployment, worsening socio-economic crisis and underdevelopment. It was recommended that entrepreneurship skills development should be integrated in the curriculum of agricultural education at all levels.

Keywords: Entrepreneurship Skills, Sustainable Development, Skill Acquisition, Self-Reliance; Unemployment.



Impact of Digital Technology on Instructional Resources in Teaching and Learning of Agricultural Science in Secondary Schools in Kogi State

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Abstract

The impact of digital instructional materials, in teaching and learning is very important in the field of academic. The teaching of agricultural science in secondary schools in Nigeria needs to be properly handled. Digital technologies brought change to the scope of education and led education systems worldwide to adopt strategies for ICT integration. Therefore, the purpose of this study is to identify the impact of digital Technology or instructional resources in teaching and learning of Agricultural Science in Secondary schools in Kogi State. For the purpose of the study data was collected from 50 Secondary School in Ankpa Local Government of Kogi State. The agricultural Science Teachers and students in the sample schools were administered constructed questionnaire. Data collected were analyzed using mean to answer the research questions. Results of the study indicated that adequate supply of Digital instructional resources have significant impact on student's performance in agricultural science. The results also revealed that schools with adequate teacher's quality and Digital instructional resources showed superiority than schools that lacks resources. The study recommended that the government should provide the necessary Digital technology to replace the analogue instructional materials for teaching and learning in all the schools in the studied areas.

Keywords:



Role of Business Education in Bridging the Digital Divide in Agricultural Education and Entrepreneurship in Enugu State

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Abstract

This study investigated the role of Business Education in bridging the digital divide in Agricultural Education and entrepreneurship in Enugu State. Three research questions were developed and answered in line with purpose of the study. The study adopted a descriptive survey research design. The population for the study was 500. A sample of 300 was used for the study through stratified random sampling technique. A structured questionnaire was generated from the literature reviewed and developed for the study. The questionnaire was validated by three experts, two from the Department of Business Education and one from Agricultural Education, University of Nigeria Nsukka. The instrument's reliability was established using Cronbach Alpha, yielding a coefficient of 0.88 internal consistency. The questionnaire was distributed to the respondents with the help of two research assistants. Data collected was analyzed using mean and standard deviation to answer the research question while the hypotheses were tested using t-tests and ANOVA. The findings of this study revealed that digital tools significantly enhance agricultural education by improving access to online learning resources, precision farming techniques, and agribusiness opportunities. However, key barriers to technology adoption includes inadequate digital tools, infrastructure, and the high cost of digital literacy, poor internet infrastructure, and the high cost of digital tools. The study concluded that Business Education is essential in equipping individuals with the necessary digital competencies to bridge gap between agricultural education and entrepreneurship.

Keywords; Business Education, Digital Divide, Agricultural Education, Entrepreneurship, Digital Literacy.



Innovative Technologies for TVET - Private Sector Engagements to Promote Graduate Employability in Enugu State

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Abstract

This study explored innovative technologies for enhancing Technical and Vocational Education and Training (TVET) - private sector engagement to promote graduate employability in Enugu State, Nigeria. Specifically, it identified innovative technologies for TVET-private sector engagement, assessed their extent of adoption, examined challenges hindering effective TVET private sector engagement, and proposed strategies to address these challenges. The study adopted a survey design with a population of 153 academic staff. A 40-item structured questionnaire, validated by three TVET experts and with a reliability coefficient of 0.81, was used for data collection. Data were analyzed using mean and standard deviation, while hypotheses were tested with T-test. Findings revealed that innovative technologies such as artificial intelligence (AI), virtual reality (VR), augmented reality (AR), and e-learning platforms are critical for enhancing TVET-private sector engagement and graduate employability. However, the adoption of AI is slightly high while VR and AR is adoption remains low. Findings on the challenges revealed inadequate infrastructure, insufficient funding, lack of technical expertise, and poor alignment between TVET curricula and industry needs as key challenges. The study proposed while fostering stronger partnerships with private, strategies such as increasing investment in technology infrastructure, and revising TVET curricula to align with industry demands should be implemented. The study concluded that integrating innovative technologies into TVET programs is essential for improving TVET-private sector engagement and graduate employability. It recommended collaboration among government agencies, TVET institutions, and private sector organizations to create conducive environment for technology adoption, ensuring graduates possess skills relevant to the labor market.

Keywords: Innovative Technologies, TVET, Private Sector Engagement, Graduate Employability, Artificial Intelligence (AI), Virtual Reality (VR).



Effects of Organic and Inorganic Manure on Growth and Yield of Carrot in Nsukka Local Government Area, Enugu State

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Abstract

The study determined effects of organic and inorganic manure on growth and yield parameters of carrot in Nsukka local government area. Study adopted true experimental (complete randomized) design. Three research questions guided the study. Population of study was 80 carrot seeds purchased from market garden Enugu. Purposive sampling technique was used to select 40 healthy carrot seedlings, made up of 10 seedlings in each of the treatment and control group. The Instrument for data collection was template while the materials were measuring tape and weighing scale. The template was validated by three experts. Data was collected by researchers and assistants through counting of leaves, and branches; measuring leaves and branches at intervals of 2, 4, 6, and 8 weeks; and weighing of the harvested products at the end of experiment. Data collected were recorded in the template and analyzed using mean. The results revealed that combined organic and inorganic manure performed highest in height with mean of 3.43, 16.27 and 30.13, also in number of leaves 3, 6, and 8.8 respectively, followed by organic manure with means 4.2, 15.34 and 27.9, number of leaves 2.9, 5.8, and 8.6 respectively; then inorganic 2.39, 9.94 and 24.21, number of leaves 2, 5.2 and 6.8 respectively. Root weight and length have not obtained as the plants have not matured. It is recommended that farmers should use poultry manure (organic) in cultivating carrot instead of inorganic fertilizers (NPK) to reduce cost and for optimum yield.

Keywords: Organic Manure, Inorganic Manure, Growth, Yield, Carrot Production.



Digital and Smart Technologies in Agricultural Education, Production, and Precision Farming

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Abstract

Agriculture in Nigeria is undergoing a transformative shift with the integration of digital and smart technologies. These technologies are enhancing agricultural education, increasing productivity, and driving efficiency in precision farming. This paper explores the role of digital tools such as Artificial Intelligence (AI), Internet of Things (IoT), Geographic Information Systems (GIS), and automation in modernizing agricultural practices. It also highlights the impact of e-learning platforms in agricultural education, enabling farmers and students to access knowledge remotely. The study draws on Nigerian authors' perspectives, examining local case studies and challenges such as poor digital infrastructure and adoption barriers. The paper argues that leveraging digital solutions can enhance food security, reduce production costs, and promote sustainable agricultural practices in Nigeria. Policy recommendations for the adoption of digital and smart technologies in agriculture are provided to ensure Nigeria's agricultural sector remains competitive in the global economy.

Keywords: Digital Technologies, Smart Farming, Precision Agriculture, Agricultural Education, Nigeria.



Cultivating Future Generation through Innovations in Sustainable Agriculture and Environment

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Abstract

The study was designed to enhance the future generation through innovations in sustainable agriculture and environment. Descriptive survey research design was adopted for the study and the study was carried out in Nsukka Agricultural zone which comprises of Nsukka LGA, Udenu LGA and Igbo Eze South LGA of Enugu State. Three specific research questions with three corresponding hypotheses guided the study. The population for the study was 45 respondents made up 35 agricultural education lecturers and 10 extension agents in the study zone. The instrument for data collection was structured questionnaire titled, "Cultivating Future Generation through Innovation in Sustainable Agriculture and Environment" (CFGTISAE). The research instrument was face validated by three experts, two from Department of agricultural education and one from Department of Agricultural Economics in Faculty of Vocational and Technical Education and Faculty of Agriculture, University of Nigeria, Nsukka respectively. Cronbach alpha was used to determine internal consistency of the questionnaire which yielded 0.83 coefficients. Data collection was done by the researchers with two research assistants. Mean statistics was used to answer the research questions while t-test statistics was used to test the null hypotheses at 0.05 level of probability. Real limit of numbers was applied in decision making for the research questions. The results show that a lot of innovations are required for sustainable agriculture and environment in enhancing the future generation. The study also highlighting the effects of sustainable agriculture and environment in enhancing future generation among others. It was therefore recommended among others that farmers should be educated on certain innovations in agriculture and environment needed for future generation and there is also need to foster environmental management practices that will promote its sustainability towards agricultural improvement.

Keywords: Cultivating, Future generation, Innovations, Sustainable, Agriculture.



Innovative Pedagogical Strategies for Teaching Sustainable Agribusiness Models in Agricultural Education Institutions in Enugu State

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Abstract

This study determined the innovative pedagogical strategies for teaching sustainable agribusiness models in Agricultural Education Institutions in Enugu State. The study was guided by 4 research purposes and answered four related research questions. A descriptive survey research design was employed, involving lecturers and technical staff from selected Agricultural Education Institutions. Data was collected using structured questionnaires. The structured questionnaire was validated by three experts in agricultural education while the reliability coefficient was determined using Cronbach alpha reliability test. The data generated was analyzed using descriptive and inferential statistics. Findings revealed innovative pedagogical strategies for teaching agribusiness models to include experiential learning approaches, internships among others, while the role of university – industry partnership in promoting sustainable agribusiness education was identified to include help universities to design demand-driven curricula, promote acquisition of practical and emerging skills in climate-smart agriculture, regenerative farming, and agrivalue chains and provide students with hands-on experience through internships, apprenticeships, and on-the-job training in sustainable agribusinesses among others. The challenges faced by agricultural education institutions in teaching sustainable agribusiness models include limited resources and inadequate training for educators, while the strategies that could overcome the challenges faced by agricultural education institutions in teaching sustainable agribusiness models include strengthening industry partnerships, adopting experiential learning, and developing a curriculum that integrates emerging technologies in agricultural education. The study recommends integrating interactive and technology-driven teaching methods to enhance industry partnership in agricultural education delivery.

Keywords: Innovative Pedagogy, Teaching Strategies, Agribusiness Education, Agricultural Education Institutions.



Psychological Empowerment as Correlates of Job Satisfaction, Behaviour and Performance of Accounting Personnel in Agricultural and other Ministries in Enugu State, Nigeria

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Abstract

The study determined psychological empowerment as correlates of job satisfaction, behaviour, and performance of accounting personnel in Government Ministries in Enugu State, Nigeria. The study adopted a correlative research design and was carried out on all the accounting personnel in government ministries in Enugu State of Nigeria. The population for the study comprised of 566 accounting personnel in the 25 government ministries, and the Accountant General Office. The entire population was used for the study since the population was manageable. A researcher developed instrument, titled “Psychological Empowerment as correlates of job satisfaction, behavior and performance questionnaire” (PECJSBPQ) was used for data collection. The questionnaire was validated by five research experts. The reliability of the instrument was established by administering 30 copies of the questionnaire to 30 accounting personnel in government ministries in Imo State. Cronbach Alpha was used for estimating the reliability of the instrument, and the reliability coefficient of .917 for psychological empowerment of employees, .886 for employee job satisfaction, .843 for employee job behaviour, .863 for employee job performance, with an overall coefficient of .880. The data collected was analyzed using Pearson correlation product moment correlation to answer the research questions, while Linear and multiple regression analysis were used to test the null hypothesis at 0.05 level of significance. The study revealed a significant correlation between psychological empowerment and job satisfaction, job behavior and good job performance. Based on the findings it was recommended that accounting personnel in government ministries in Enugu State should be empowered psychologically by providing conducive work environment for her accounting personnel.

Keywords: Psycholological Empowerment, Job Satisfaction, behaviour, Performance Correlation, Accounting Personnel, Government ministry.



Harnessing Innovative Strategies for Youth Engagement in Agripreneurship Development: Empowering the Next Generation

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Abstract

The study, "Innovative Strategies for Youth Engagement in Agripreneurship Development: Empowering the Next Generation," explored youth participation in agripreneurship in Lagos State, Nigeria, focusing on five wards of the Oto-Awori Local Development Council Area. Targeting fresh graduates, the research aimed to identify dynamics influencing their involvement in agricultural entrepreneurship. A survey design was employed, using purposive sampling to select 100 participants—graduates from the past two years—across the five wards. Data was collected via a structured questionnaire, "ENGYEIS" (Engagement of Graduates in Youth Initiatives in Agribusiness Survey), and analyzed with statistical software, utilizing descriptive statistics like mean and standard deviation to address three research questions. The instrument was validated by two experts from the Tai Solarin University of Education. Findings revealed a low level of youth participation in agripreneurship, with respondents disagreeing on five items assessing current engagement levels (grand mean of 2.77). Conversely, they agreed that innovative strategies could significantly enhance participation, with a grand mean of 3.57 across five related statements. Barriers to accessing agripreneurship opportunities were also acknowledged, with a grand mean of 3.13 for five corresponding statements. The results underscored significant gaps in awareness and resource accessibility, while identifying promising interventions to boost engagement. The study concluded that youth involvement in agripreneurship remains limited due to these barriers, yet innovative strategies offer potential solutions. Researchers recommended that policymakers, educational institutions, and organizations prioritize and implement such strategies to empower youth in agripreneurship, fostering sustainable development and economic growth for the next generation in Lagos State.

Keywords: Youth Engagement, Agripreneurship, Participation, Innovation, Empowerment.



Adoption of Sack Farming Model for Enhancing the Teaching and Learning of Agricultural Science in Urban Secondary Schools in Abia State

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Abstract

Agricultural education in Urban Secondary Schools in Nigeria faces challenges due to limited access to farmland and practical resources, which hinder students' hands-on learning experiences. Notably, sack farming is an innovative, cost-effective and space-efficient agricultural model that holds significant potential for enhancing the teaching and learning of Agricultural Science in urban secondary schools. However, its adoption among Agricultural Science teachers in Urban Secondary Schools in Abia state remains unclear in literature. Thus, this study examined the awareness level, extent of adoption and enablers for adopting sack farming as a viable model for enhancing teaching and learning by Agricultural Science teachers in secondary schools in urban regions of Abia State. A survey research design was employed. Twenty-six (26) Agricultural Science teachers were randomly selected from both public and private Secondary Schools in Aba and Umuahia. Data were collected using a structured questionnaire and analysed using descriptive statistics such as mean and standard deviations. Findings revealed that awareness of sack farming among teachers was high. However, it was observed that the actual adoption of sack farming in teaching and learning was very low. Also, several strategies for adoption were identified by the study, including teacher training workshops, school demonstration sack farms and integration into the Agricultural Science curriculum, among others. The study concludes that while sack farming is widely known, its application in secondary school teaching remains minimal. To enhance adoption, it is recommended that educational stakeholders should organise hands-on training for teachers and incorporate sack farming into practical Agricultural Science lessons.

Keywords: Sack Farming, Agricultural Science, Teaching Strategies, Urban Schools, Abia State.



Exploring the Role of Innovative Drought Control Measures in Improving Crop Yield and Farmers Livelihood in Benue State, Nigeria

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Abstract

Benue State has been experiencing prolonged drought, leading to crop failures, increased farming costs, water shortages, and reduced local food production. This study investigated the role of innovative drought control measures in improving crop yield and farmers' livelihoods in the state. Three research questions and hypotheses guided the study. The study population included 1,150,000 registered crop farmers, with a sample size of 400 (250 male and 150 female farmers) selected from the three geopolitical zones of Benue State using the Taro-Yamane formula and a multistage stratified sampling technique. Nine local government areas were purposively chosen for data collection. A structured 54-item questionnaire titled Role of Innovative Drought Control Questionnaire (RIDCQ) was developed and validated by experts. The instrument's reliability was confirmed using the Cronbach alpha method, yielding a coefficient of 0.868. Data analysis involved mean scores to answer research questions and independent t-tests to test hypotheses at a 0.05 significance level. Findings revealed low adoption of innovative drought control measures and a significant impact of drought on crop yield and farmers' livelihoods. The study recommended that agricultural extension services and stakeholders train farmers on innovative drought control methods to enhance crop production and improve livelihoods in Benue State.

Keywords: Drought, Innovative Control Measures Crop Yield, Farmers Livelihood.



Effect of Flip Classroom and Project Instructional Delivery Method on Students' Academic Achievement in Electric Fish Production in Universities in South East Nigeria

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Abstract

This paper examined the effectiveness of flip classroom and project method instructional delivery on students' academic achievement in Electric fish production in Universities in South East Nigeria. Quasi experimental factorial design was adopted. Five objectives were formulated. Five research questions and five hypotheses were tested. The population was 919 students from five federal, five state and nine private universities in South East Nigeria. The sample for the study was 87 which comprises of 33 males and 54 females. Simple random sampling technique was used to select University of Nigeria, Nsukka (30) and Federal University of Technology, Owerri (57) from 5 federal universities. Electric fish production cognitive achievement test (EFPCAT); Electric fish production Psychomotor Achievement Test (EFPPAT), and Electric fish production Interest Inventory (EFPII) were used to collect data and tested at 0.05 level of significance. Kuder Richardson formula 20(K-R 20) was used to find the internal consistency of EFPCAT at 0.791, Pearson Product Moment Correlation Coefficient (PPMCC) was used to find the coefficient of stability of the EFPCAT at 0.766 and Cronbach Alpha method was used to determine the internal consistency of EFPPAT and EFPII which yielded 0.824 for FPPAT and 0.716 for FPII. The data obtained were analysed using mean, standard deviation and analysis of covariance (ANCOVA). The result indicated significant difference between the academic achievements of students taught using flip classroom method and those taught using project methods. Flip classroom method was recommended to Agricultural teachers among others.

Keywords: Electric Fish Production, Academic Achievement, Flip Classroom and Project Instructional Delivery Method.



Proximate Composition and Anti-nutrients profile of *Pleurotus tuber-regium* Biodegraded Harvest Paddy Waste for Livestock feeds

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Abstract

This study evaluated the feed value and Anti-nutrients profile of *Pleurotus tuber-regium* (PTR) biodegraded harvest paddy waste (HPW). The experiment was conducted at Nutrition laboratory Department of Animal Production and Livestock Management, Michael Okpara University of Agriculture Umudike, Abia State. The design of experiment was completely randomized design (CRD) with five treatments each replicated three times. The treatments were non-biodegraded, 21days, 28day, 35 days and 42days biodegraded labeled T1, T2, T3, T4 and T5. The harvest paddy waste materials and *Pleurotus tuber-regium* was washed were prepared by washing, shredded and treated. The shredded *Pleurotus tuber-regium* was soaked in water at room temperature for two hours before incubating it in a white bucket for three days to develop spores. *P. tuber-regium* was used to inoculate harvest paddy waste at regulated days (0, 21, 28, 35 & 42) for biodegraded effect paddy waste. Each of samples was analysed at the end of the biodegraded period for proximate composition and anti-nutrients using standard prescribed procedures. The data generated were subjected to ANOVA and means separated using Duccan Multiple Range. The proximate composition and anti-nutrient parameters examined had significant ($P= 0.005$) difference among the treatments. In conclusion, biodegraded harvest paddy waste at 28 and 35days showed greater nutrients content. At 42 days there no changes in content of most nutrients and anti-nutrients tested but quantity of protein was decreasing. It was recommended that harvest paddy waste should be biodegraded for at least 32 days.

Keywords: Biodegraded, Harvest Paddy Waste, *Pleurotus Tuber-Regium*. Nutrient.



Policy and Regulatory Framework for Enhancing Agro-Industrial Waste Management Practices in Calabar Metropolitan Area of Cross River State

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Abstract

The study explored Government policy and regulatory framework for enhancing agro-industrial waste management practices in Calabar Metropolitan Area of Cross River State. Five specific purposes, five research questions and five null hypotheses guided the study. The study adopted descriptive survey research design. The population for the study was 100 comprising of 40 staff of Calabar Urban Development Authority (CUDA) and 60 Residents of Calabar Metropolis. The population is small, the entire population was therefore incorporated into the study; there was no sampling. The study used a structured questionnaire with 44 items rated on a four-point scale. The instrument was face validated by experts from the Department of Agricultural Education, University of Nigeria, Nsukka. Mean and standard deviation were used to answer the research questions while t-test was used to test the hypotheses at 0.05 level of significance. Findings revealed eleven (11) types of agro-industrial waste, nine (9) items on the effect of agro-industrial waste agreed by the respondents, seven (7) items on waste management practices adopted was agreed by the respondents, eleven (11) items were agreed as the challenges of effective waste management and seven (7) items strategies for enhancing agro-industrial waste management were identified. The study therefore, recommends that public enlightenment and education should be regularly carried out by National Orientation Agency and other stakeholders on better management of agro-industrial wastes.

Keywords:



Effects of Virtual Classrooms on Interest and Academic Achievement among University Students of Agricultural Education in North-Central Nigeria

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Abstract

The study explored the effects of virtual classrooms on academic achievement among university students of Agricultural Education in North-Central Nigeria (NCN). Multimethod (survey & quasi-experimental) research design was adopted for the study. Four research questions and two hypotheses guided the study. The population for the study consisted of 172 respondents from Agricultural Education of three universities in NCN. Purposive sampling was used in selecting the three universities in NCN. Two sets of instruments were used for data collection including fisheries interest inventory (FII) and Cognitive achievement test on fishery (CATF). The FII contains 17 structured questionnaire items while the CATF contains 50 multiple choice questions (MCQ). The FII and CATF were subjected to face and content validation by three experts. The reliability of the instruments was determined using Cronbach alpha test for internal consistency for FII with index value of 0.84 while Kuder-Richardson formula 20 (KR-20) technique was used for CATF which revealed an index of 0.79 coefficients. Mean was used to answer the research questions while analysis of covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. Findings revealed that: There was significant difference ($p > 0.05$) in the mean students' interest on fisheries between zoom and more effect in google classroom. Furthermore, google classroom showed more effect on students' achievement in fisheries than zoom. The study recommended that virtual classrooms should be included in the curriculum of Agricultural Education by National Universities Commission (NUC) to help with instructional delivery.

Keywords: Virtual Classroom, Academic Achievement, University Students, Agricultural Education.



Effects of Botanical Extracts on Maize Pest Control in Nsukka Agro-Ecological Zone, Enugu State

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Abstract

The increasing demand for maize in Nigeria, coupled with pest-induced yield losses, threatens food security and economic stability. Climate change, poor agronomic practices, and resistant pest species further exacerbate this challenge. This study evaluates the comparative effectiveness of ginger and onion extracts as biopesticides on maize growth performance in the Nsukka agro-ecological zone, Enugu State. Specifically, it investigates their impact on controlling major pests (stem borer) and enhancing maize yield. The study adopted an experimental design using a split-plot in a randomized complete block design with three replications. The population comprised maize plants grown from one cup (approximately 250 ml) of dent maize variety, procured from the Department of Crop Science, University of Nigeria, Nsukka. A total of 200 seeds were randomly selected and planted. The experiment consisted of three treatments, each replicated three times, totaling 180 maize plants (20 stands per plot). A total of 135 stands were studied, with 15 stands per plot. Data were analyzed using mean and standard deviation, while ANOVA and Duncan's multiple range test ($P \leq 0.05$) were used to test hypotheses 1 and 2, and a t-test was applied to hypothesis 3 at a 0.05 level of significance using SPSS software. Findings revealed that ginger extract spray significantly improved maize growth, with higher plant height and leaf number, while the control group had the least growth. Based on these findings, farmers are encouraged to use botanical extracts as sustainable pest control alternatives to improve maize productivity.

Keywords: Botanical Extracts, Pest Control, Ginger Extract, Onion Extract, Stem Borer, Biopesticides, Growth Performance.



Perceived Potentials of Agricultural Entrepreneurship in Prompting Sustainable Livelihoods among Agricultural Education Graduates in Enugu State, Nigeria

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Abstract

This study determined the perceived potential of agricultural entrepreneurship in fostering sustainable livelihoods among Agricultural Education graduates in Enugu State, Nigeria. The study was guided by four specific purposes and four related research questions. The survey research design was adopted for the study. The population for the study consisted of 150 Agricultural Education Graduates. The intact population was used for the study. The instrument for data collection was a structured questionnaire. The instrument was validated by three experts in agricultural education while the reliability coefficient was determined using the Cronbach reliability test which yielded a reliability coefficient of 0.79. The instrument was administered through direct contact. The mean and standard deviation were used to answer the research question. The findings reveal a strong perception of agricultural entrepreneurship as a promising avenue for enhancing income generation, skills development, and economic resilience. Five factors that influence agricultural entrepreneurship intentions among agricultural education graduates, five challenges faced by graduates in starting up agricultural business, and six roles of agricultural education in developing entrepreneurship intentions among agricultural education graduates were identified. Based on the findings, it was concluded that agricultural entrepreneurship has great potentials in fostering sustainable livelihoods among Agricultural Education graduates in Enugu State if the challenges and obstacles to entrepreneurship development are addressed. It was recommended that agricultural education institutions should integrate entrepreneurship education in the curriculum, while relevant government agencies and stakeholders should provide facilities and enabling environment for graduates to invest in agribusinesses.

Keywords: Agricultural Entrepreneurship, Sustainable Livelihoods, Agricultural Education Graduates.



Analysis of Technological Trends in Agricultural Production

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Abstract

As the world's population is expected to reach about 9.7 billion by 2050, agriculture is facing an increase in demand for food productivity, efficiency, and sustainability to ensure food security. In Nigeria, a serious challenge for the agricultural production and food systems Such as insecurity, pest and diseases, low fertility status of the soil, resource scarcity, climate change may be easier to overcome with the application of innovative technological trends in agricultural production. This paper reviewed agriculture and food systems in order to find innovative approaches at improving food production and utilisation to enhance food security. The paper also studied emerging technological trend to find out its impact on agricultural production. The paper discovered that recent advances in technology have transformed the agricultural sector, enabling farmers to increase efficiency, productivity, and sustainability. These trends indicate that precision agriculture uses advanced technologies such as drones, satellite imaging, and sensors to optimize crop yields and reduce waste. Similarly, the Internet of Things (IoT) and artificial intelligence (AI) are being used to monitor and control agricultural systems, enabling real-time decision-making and improving resource allocation. The agricultural sector is undergoing a significant transformation, driven by advances in technology, changing consumer preferences, and environmental concerns. This paper provided current technological trends in agricultural production, exploring their benefits, challenges, and future prospects. The study concluded that, the technological trends in agricultural production such as precision agriculture, automated irrigation, block chain technology, digital farming, drone and satellite imaging, artificial intelligent and machine learning, data analytics via the Internet of Things (IoT) offer significant potential to increase yield, optimize resource usage, promote sustainability, reducing waste, and increasing efficiency.

Keywords: Technology, Precision Agriculture, Irrigation, Internet of Things, Artificial Intelligent, Block Chain.



Urban Agricultural Practices in Nsukka Metropolis: Constraints and Enhancement Measures

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Abstract

This paper determined the constraints and enhancement measures for the practice of urban agriculture in Nsukka metropolis. The study adopted descriptive survey research design. Two research questions guided the study. The population for the study was 1807, comprising of 1800 registered farmers and 7 extension agents in Nsukka metropolis. Purposive sampling method was used to select 137 registered farmers and extension agents in Nsukka metropolis for the research. A structured questionnaire was used as an instrument for data collection. The instrument was validated by three experts in Agricultural Education. The reliability of the instrument was determined using Cronbach Alpha which yielded coefficient of 0.76. Mean score and standard deviation were used to answer the research questions. The findings revealed that, poor access to water, land and farming inputs, inadequate storage skills, inadequate integration of modern technology and innovation, limited financial capacity, among others are the constraints to urban agricultural practices in Nsukka metropolis; while the measures for enhancing urban agricultural practices in Nsukka metropolis includes access to land space, finance, water, provision of better infrastructure, among others. The paper recommended that, financial institutions and the relevant government agencies should provide accessible credit facilities at low-interest rates, grants, and promote cooperative savings schemes for urban farmers among others. The study also highlighted that urban farmers lack adequate knowledge of modern agricultural practices. To bridge this gap, agricultural extension services should be strengthened to provide farmers with regular training on best farming practices, pest control, organic farming, and post-harvest handling.

Keywords: Urban Agriculture Practices, Challenges Of Urban Agriculture, Enhancement Measures.



Economic Assessment of Yam Consumption Pattern Among Rural Households in Umuahia North Agricultural Zone of Abia State, Nigeria

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Abstract

The study analyzed the consumption pattern of yam among rural households in Umuahia North Agricultural Zone of Abia State, Nigeria. Specifically, the study described the socio-economic characteristics of the household heads; ascertained the food forms of yam consumed; assessed the frequency of consumption of yam; ascertained the preference patterns of yam food forms and determined the monthly expenditure on yam among rural households in the study area. Multi-stage random sampling procedure was adopted to select 130 respondents used for the study. Data for the study were collected using a questionnaire validated by three experts. The reliability of the questionnaire was established using Cronbach Alpha reliability procedure which yielded a coefficient of 0.82. Data were analyzed with the use of descriptive statistics such as frequencies, mean scores, Standard deviations and regression analysis. The general findings of the study showed that most of the respondents were males with the age range of 30-49 years and a mean household size of 6 persons. The results suggest moderate illiteracy level among the respondents. Most of the respondents consumed yam boiled, 2-3 times/week. Boiled yam is the most preferred with 50.88%. The monthly expenditure of yam food form showed that the monthly expenditure on yam was between ₦61,000-₦80,000. It was therefore recommended that the rural dwellers should expand their farming hectarage and improve on their yam cultivation as all the food forms of yam are important food among rural households in the study area.

Keywords: Yam, Consumption Pattern, Food Forms, Rural Household.



Entrepreneurial Competencies: Empowering the Youth for Sustainable Farm Enterprises in South-Eastern Nigeria

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Abstract

Entrepreneurship has gained significant attention in education, yet its impact remains limited, as seen in the high unemployment rate among graduates. Many Nigerian youths lack the innovative skills and business acumen needed to establish sustainable farm enterprises. This study examined the essential capabilities required to promote small farm enterprises among the youth, particularly secondary school graduates. A mixed-method research design, incorporating a questionnaire survey and Focus Group Discussion (FGD), was employed. The study involved 137 participants, including 117 Agricultural Science Teachers from 59 public secondary schools in Nsukka and 20 Agricultural Extension Agents. Data were collected through structured questionnaires and FGDs with two groups of five participants each. Descriptive and inferential statistical tools were used for data analysis. Findings indicate that technical expertise, managerial proficiency, and problem-solving skills are crucial for enabling secondary school graduates to identify, plan, and manage small farm enterprises effectively. The FGD reinforced these findings, highlighting the need for diverse teaching methods to enhance practical skills. The study concludes that upgrading agricultural knowledge and entrepreneurial capacity is essential for youth empowerment to sustain our economy. It recommends involving students in school farm planning, fostering public-private partnerships for capacity building, and adopting participatory learning techniques to strengthen hands-on training in agricultural education.

Keywords: Agribusiness Education, Youth Empowerment, Sustainable Farming, Practical Skills Development, Vocational Training, Innovative Agriculture.



A Review of Innovation Needs in Organic Food Production and Processing for Sustainable Rural Livelihoods in Nigeria

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Abstract

Organic food production holds significant potential for enhancing sustainable rural livelihoods in Nigeria, yet the sector remains underexploited and underdeveloped due to persistent innovation gaps. This paper reviewed the essential innovation needs in organic food production and processing that can drive sustainable rural livelihoods in Nigeria. The paper adopts a comprehensive and systematic review of recent literature and empirical studies to examine current practices, innovation needs in organic food production, identify barriers to innovation adoption, and assesses the roles of technology, institutions, knowledge systems, and policy frameworks in promoting organic food production in Nigeria. The reviewed revealed innovation needs in organic food production to include technological, institutional, social and cultural innovations among others. From the findings in the review, it was concluded that introducing and adopting specific innovations in organic food production and processing is essential for promoting sustainable rural livelihoods. It was recommended that relevant government agencies and nongovernment organizations should put in place policy and regulatory framework to promote organic food production and processing, grant greater access to finance and needed resources, infrastructure and market Access, as well as break socio-cultural and behavioral barriers to the practice of organic food production.

Keywords: Innovations, Innovation Needs, Organic Food Production And Processing, Rural Households, Sustainable Rural Livelihoods.



Financial Risks Management Strategies for Profitable Poultry Farming in Kwara State

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Abstract

The study investigated the financial risks management strategies for profitable poultry farming in Kwara State. The study has two research questions and corresponding hypotheses. A survey research design was adopted for this study. The state is made up of sixteen (16) Local Government Areas (LGAs) which are grouped into four (4) agricultural zones (A, B, C, and D) by the state's Agricultural Development Project (ADP). The population for the study was 215 farmers. There was no sampling for the study. A structured questionnaire was used for the study. The name of the instrument is financial risks management strategies (FRMS). The instrument was subjected to face validation by three experts. The Cronbach Alpha (α) K-R₂₀ method was used to test the reliability of the instrument. A reliability index of 0.87 was obtained. Two hundred and fifteen (215) copies of the questionnaire were administered to the respondents by the researcher with the aid of four research assistants (ADP extension agents). The data generated were analyzed using descriptive statistics such as mean and standard deviation while the t-test was used to test the null hypothesis at a 0.05 level of significance. The findings of the study revealed the failure to meet cash flow needs in a timely manner has a high financial risk. In addition, the study revealed improving access to credit by borrowing from friends and relatives as a financial risks management strategy. The study recommends ensuring proper record keeping, tracking incomes and expenditures for adequate planning for profitable commercial poultry farming.

Keywords: Financial Risks, Risks Management Strategies, Poultry Farming, Kwara State.



Effects Of Different Types of Manure on Growth Performance of Turmeric in Nsukka Local Government Area

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Abstract

The study was carried out to determine the effects of different types of manure on growth performance of turmeric in Nsukka. The study adopted experimental research design, using randomized complete block design with three replications. The population for the study was 324 stands of turmeric crop. The sample for the study was 179 stands of turmeric crop. Three blocks labelled A, B and C were used for this study. The three blocks represented the three replicates. Each of the blocks was sub-divided into six plots representing the six treatment units. Random sampling technique was used to assign each of the six plots to T₀, T₁, T₂, T₃, T₄ and T₅ representing control, poultry manure, cattle manure, goat manure, pig manure and inorganic fertilizer respectively. The instrument for data collection was observation template. Data on plant height, length of leaves was collected using measuring tape while data on number of leaves, number of ratoons was collected using counting method. Data collected for the study were organized and analysed based on research questions using Statistical Packages for Social Science (SPSS) version 23. Research questions were analysed using mean while Analysis of variance (ANOVA) was performed on the data collected to test the null hypothesis at 0.05 level of significance. Difference between means were compared using least significant difference (LSD, $p \leq 0.5$). The finding of the study revealed that poultry manure applied at 12 tonnes/ha had the highest mean plant height (44.35cm), number of leaves (8.30), number ratoons (6.27). The plots that received pig manure treatments at 12t/ha produced the highest mean length of leaves (24.74cm) while control treatments group 0t/ha was the least in all the growth parameters measured. Significant difference was observed among the turmeric treated with different types of manure in terms of growth performance. The study concluded that poultry and pig manure treatment perform better in growth performance of turmeric in the study area when compared to other treatments. The study recommended among others that poultry and pig manure at 12 tonnes/ha should be used for production of turmeric in the area.

Keywords: Turmeric, Manure, Growth.