GENDER AS PREDICTOR OF ENTREPRENEURIAL COMPETENCIES NEEDED BY UNIVERSITY UNDERGRADUATES IN CASSAVA FARMING IN DELTA STATE

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Abstract

This study identified the entrepreneurial competency improvements needed by university undergraduates for entry into cassava farming to support the sustainable development goal (SDG) of no poverty in Delta State, Nigeria. Anchored on Human Capital Theory, the study addressed two research questions and tested two hypotheses using a descriptive survey design. The population comprised 275 undergraduates studying Agricultural Education and Crop Science in the four state-owned universities in Delta State, with no sampling involved. Data were collected using a structured questionnaire, the "Entrepreneurial Competencies Needed in Cassava Farming Questionnaire (ECNCFQ)," which was validated by three experts and had a reliability coefficient of 0.855, indicating high reliability. Among the 250 completed questionnaires, responses were analyzed using frequency counts, percentages, mean, standard deviation, and Improvement Need Index (INI), while t-tests were applied to test the hypotheses at a 0.05 significance level. The findings highlighted those undergraduate required improvements in 15 planning areas and 11 innovation areas related to cassava farming. However, gender was determined as a non-significant predictor of the entrepreneurial competencies needed by university undergraduates in cassava farming in Delta State. The study concluded that enhancing these competencies is essential and recommended their integration into the Agricultural Education and Crop Science curricula in Delta State universities to better prepare students for entrepreneurial activities in cassava farming.

Keywords: agricultural education, cassava farming, entrepreneurial competencies, gender

Introduction

The Food and Agricultural Organization (FAO, 2018) reported that cassava is one of the fastest-expanding staple food crops in cassava-consuming countries and has continued to gain prominence among farmers while the industrial demand is also rising consistently. According to Owoseni *et al.* (2021), it provides the livelihood of up to 500 million farmers, countless processors, and traders around the world. Cassava production has consistently grown by more than 3% annually on a global scale (FAO, 2018). In 2018, the world produced over 278 million tonnes of cassava, with Africa producing about 170 million tonnes (or about 56% of the global output), and Nigeria produced roughly 60 million tonnes about the same time (FAOSTAT, 2019). Denton, *et al.* (2004) stated that Nigeria is the world's largest producer of cassava and about 90% of the products are consumed domestically, with insignificant amounts left for industrial use. Despite Nigeria being the largest producer of cassava, Poverty, Oxford and Human Development Initiative (2017), and FAO (2018) complained that the current food production is far from being able to meet the food needs of the geometrically growing population

in the sub-region. This implies that the performance yield has not been able to meet with demand for the product. This low yield may be linked to ineffective agronomic practices and inefficient management of production resources, which can be broadly termed as a lack of entrepreneurship competencies possessed by farmers, especially the youths who are the future farmers that will dominate the cassava production industry to ensure sustainability and curb the menace of poverty in Nigeria. This line of argument has been robustly debated by various researchers such as Tadele and Assefa (2012), and Fakayode, *et al.* (2008).

Nigeria has a population of close to 202 million, which is about half of the West African population, and is the most populated country in Africa (World Bank, 2020). The country is rich in human and material resources with a Gross Domestic Product of $375.745 billion in 2016 (World Bank, 2017). China, on the other hand, imports more than 80% of the total world's cassava products processed into pellets and starch (FAOSTAT, 2019). The current bilateral trade agreement between Nigeria and China could further energize Nigeria's export of cassava to China in large quantities, but this has not been achieved as the current production could not even meet the local demand for food and industrial use. This supply deficit should serve as motivation for cassava farmers to produce more and eliminate the menace of poverty in Nigeria, and they can only do so when they possess the requisite entrepreneurial skills needed in cassava farming. There is a need for undergraduates who are the future farmers of tomorrow to acquire the requisite entrepreneurial competencies needed in cassava production to eliminate poverty in Nigeria, particularly in Delta State.

Entrepreneurial competencies refer to the set of skills and behaviours needed to create, develop, manage and grow a business. It was described by Mitchelmore and Rowley (2013) as a specific set of quality attributes that characterize the competency of an entrepreneur to perform a job. It was also described by Al-Mamun, *et al.* (2016) as the capability to utilize resources to improve the performance of an enterprise. In the context of this study, it is the set of skills needed by university undergraduates in cassava farming to in Delta State. Entrepreneurship competencies are connected with behaviour and decision-making skills and have been confirmed to have an encouraging influence on the financial performance of a business (Nieuwoudt, *et al.*, 2017). According to McElwee (2008), it entails networking, innovation, risk-taking, teamwork, reflection, leadership, and business monitoring, which enables a farmer to ensure the growth and development of his business. Huck and McEwen cited in Pepple and Enuoh (2020) found that the most vital competency areas for entrepreneurs are planning, budgeting, and marketing. In this study, the entrepreneurial competency improvement needed in cassava farming for no poverty will be grouped into seven competency areas, which include planning and innovation. Planning is the ability to determine goals and priorities and to assess the actions, time, and resources needed to achieve those goals; Innovation competencies allow farmers to provide significant value to their business and help in creating and refining products, capabilities, processes, and strategies (Langemeier & Boehlie, 2018).

It is, therefore, necessary that all resources are put in place to ensure that there is improvement in the skills possessed by undergraduates since research has shown that cassava is an export crop

that can help to boost the country's economy and ensure job creation for her citizens. There is a need to investigate the level of possession of planning and innovation skills by university undergraduates in Delta State, and there is a need to also investigate how demographic variables like gender and location can influence the possession of these skills by the students, and how their capacities can be improved in performing the various entrepreneurial competencies in cassava farming. This necessitated this study which investigated gender and location as predictors of entrepreneurial competencies needed by university undergraduates in cassava farming in Delta State**.**

Research Questions

The following research questions were raised to guide the study.

1. What are the planning competencies needed by undergraduates in cassava farming to achieve the SDGs of no poverty in Delta State?
2. What are the innovation competencies needed by undergraduates in cassava farming to achieve the SDGs of no poverty in Delta State?

Research Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

Ho1: There is no significant difference between the mean responses of male and female undergraduates on the planning competencies needed in cassava farming for achieving the SDGs of no poverty in Delta State.

Ho2: There is no significant difference between the mean responses of male and female undergraduates on the innovation competencies needed in cassava farming for achieving the SDGs of no poverty in Delta State.

Methodology

This study utilized the descriptive survey design. The population of the study comprised all Agricultural Education and Crop Science undergraduates in the four (4) State-owned Universities in Delta State, namely, Delta State University, Abraka; University of Delta, Agbor; Dennis Osadebe University, Asaba; and University of Science and Technology, Ozoro. The population size was 275 undergraduates, made up of 115 from Delta State University, Abraka; 37 from University of Delta, Agbor; 85 from Dennis Osadebe University, Asaba; and 38 from University of Science and Technology, Ozoro (Head of Department Offices, Abraka, Agbor, Asaba and Ozoro, 2023). There was no sampling, as the whole population size of 275 university undergraduates in Delta State was used for the study. This was due to the suggestion made by Glen (2022), that the whole population should be used in the study when the population size is small. This study employed a descriptive survey design. The population consisted of all Agricultural Education and Crop Science undergraduates in the four State-owned universities in Delta State: Delta State University, Abraka; University of Delta, Agbor; Dennis Osadebe University, Asaba; and University of Science and Technology, Ozoro. The total population was 275 undergraduates with 115 from Delta State University, Abraka; 37 from the University of Delta, Agbor; 85 from Dennis Osadebe University, Asaba; and 38 from the University of Science

and Technology, Ozoro. Since the population size was small, the entire population of 275 undergraduates was used for the study, as recommended by Glen (2022).

A structured questionnaire, titled "Entrepreneurial Competencies Needed in Cassava Farming Questionnaire (ECNCFQ)," was designed and used to collect data. The questionnaire consisted of three parts. Part 1 gathered respondents' bio-data, including sex and location. Part 2, divided into Sections A and B, included 29 items: 18 items on competencies needed in planning (Section A) and 11 items on competencies needed in cassava marketing innovation (Section B). The Competency Improvement Needs assessment technique was used, where students rated their needs and performance levels on a Likert scale. Need ratings ranged from 5 (Very High Need) to 1 (Very Lowly Needed), and performance ratings ranged from 5 (Very Highly Performed) to 1 (Very Lowly Performed). Part 3 contained 12 items on strategies for improving undergraduates' entrepreneurial competencies in cassava farming, rated on a 4-point scale (Strongly Agree, Agree, Disagree, Strongly Disagree). The questionnaire was face-validated by three experts and the reliability was established using the split-half method. Utilizing Spearman correlation statistics, a reliability coefficient of 0.855 was obtained, indicating the instrument's suitability for the study. Data was analyzed using frequency counts, percentage, mean and t-test at 0.05 level of significance.

Results

Table 1: *Biodata of University Undergraduates Studying Agricultural Education and Crop Science in Delta State (n = 250)*

Variables	Frequency (F)	Percentages (%)
Sex		
Male	113	45.2
Female	137	54.8
Total	**250**	**100**
Location		
Rural	87	34.8
Urban	163	65.2
Total	**250**	**100**

Table 1 shows the biodata of university undergraduates studying Agricultural Education and Crop Science in Delta State. The result shows that out of the 250 undergraduates who responded to the questionnaire, 54.8% are females, and the remaining 45.2% are males. Responses on their location revealed that 65.2% live in urban areas, while the other 34.8% live in rural areas.

Research Question 1: What are the planning competencies needed by undergraduates in cassava farming to achieve the SDGs of no poverty in Delta State?

Table 2: *Perceived Performance Gap Analysis of the Mean ($\bar{x}$) Responses of University Undergraduates on the Planning Competencies Needed in Cassava Farming (n = 250)*

S/N	Planning Competencies	$\bar{x}_n$	$\bar{x}_p$	PG ($\bar{x}_n - \bar{x}_p$)	Remark
1.	Developing cassava production programme for a planting season	4.78	2.92	1.86	CIN
2.	Outlining specific objectives of the business	4.52	2.88	1.64	CIN
3.	Reviewing objectives periodically to come up with some specific objectives	4.61	3.12	1.49	CIN
4.	Drawing up a budget for the production of the business	4.84	2.55	2.29	CIN
5.	Identifying sources of funding for the business	4.50	3.06	1.44	CIN
6.	Identifying relevant equipment for the production	4.51	3.12	1.39	CIN
7.	Identifying relevant personnel to run the business	3.94	3.01	0.93	CIN
8.	Identifying the cost of input	3.93	2.94	0.99	CIN
9.	Taking the total cost for operating the business	4.02	3.18	0.84	CIN
10.	Identifying different records to be kept such as records of sales, equipment	4.58	2.84	1.74	CIN
11.	Identifying a suitable location for cultivation	4.47	2.98	1.49	CIN
12.	Predicting the required inputs over a production period	4.73	3.02	1.71	CIN
13.	Predicting income from production over a production period	4.54	2.96	1.58	CIN
14.	Predicting production costs over a production period	4.48	3.06	1.42	CIN
15.	Identifying production targets in the short and long term	4.45	2.98	1.47	CIN
16.	Making arrangements for regular supplies	3.45	3.89	-0.44	INN
17.	Choosing the best production facilities	3.64	3.95	-0.31	INN
18.	Predicting targeted customers or markets for cassava	3.53	3.97	-0.44	INN

Key: $\bar{x}_n$ = Mean of Need Scale; $\bar{x}_p$ = Mean of Performance Scale; PG = Performance Gap; CIN = Competency Improvement Needed; INN = Improvement Not Needed

Table 2 presents the results on the planning competencies needed by undergraduates in cassava farming to achieve the SDGs of no poverty in Delta State. The need scale had mean scores ranging from 3.45 to 4.84, the performance scale had mean scores ranging from 2.55 to 3.97, and the performance gap showed INI of 0.84 to 2.29 for 15 items, which shows that undergraduates have high improvement needs for all the planning competencies needed in cassava farming. The performance gaps for the final three items, which are Item 16, 17, and 18, were -0.31 and -0.44,

indicating that undergraduates do not need improvement in those areas. However, the items with the highest INI were item 4 (drawing up a budget for the production of the business, 2.29), 1 (developing cassava production programme for a planting season, 1.86), 10 (identifying different records to be kept such as records of sales, equipment, 1.74), and 12 (predicting the required inputs over a production period, 1.71).

Research Question 2: What are the innovation competencies needed by undergraduates in cassava farming to achieve the SDGs of no poverty in Delta State?

Table 3: *Perceived Performance Gap Analysis of the Mean ($\bar{x}$) Responses of University Undergraduates on the Innovation Competencies Needed in Cassava Farming (n = 250)*

S/N	Innovation Competencies	$\bar{x}_n$	$\bar{x}_p$	PG ($\bar{x}_n - \bar{x}_p$)	Remark
1.	Invent a new cassava production method	4.83	2.04	2.79	CIN
2.	Utilize new knowledge acquisition modes	4.73	2.51	2.22	CIN
3.	Adoption of better problem-solving strategies	4.60	2.43	2.17	CIN
4.	Integration of knowledge from various sources	4.68	2.48	2.20	CIN
5.	Knowledge extension through elaborate creative practices	4.65	2.43	2.22	CIN
6.	Development of better farm tools to make work easier	4.58	2.01	2.57	CIN
7.	Inventing better market strategies for products	4.56	2.52	2.04	CIN
8.	Creating better ways of improving production quantity	4.75	2.50	2.25	CIN
9.	Using imagination to manipulate production efficiency	4.82	2.52	2.30	CIN
10.	Inventing better storage facilities for cassava	4.61	2.02	2.59	CIN
11.	Inventing better ways of processing cassava	4.72	1.99	2.73	CIN

The result from Table 3 shows the innovation competencies needed by undergraduates in cassava farming to achieve the SDGs of no poverty in Delta State. The mean scores ranged from 4.56 to 4.83 on the need scale, that of the performance scale ranged from 1.99 to 2.52, while that of the performance gap showed INI of 2.04 to 2.79 for all items, which implies that university undergraduates have high improvement needs for all the innovation competencies needed in cassava farming to achieve the SDGs of no poverty in Delta State. Thus, items 1 (inventing new cassava production method, 2.79), 11 (inventing better ways of processing cassava, 2.73), and 10 (inventing better storage facilities for cassava, 2.59) recorded the highest INI.

Hypothesis One: There is no significant difference between the mean responses of male and female undergraduates on the planning competencies needed in cassava farming for achieving the SDGs of no poverty in Delta State.

Table 4: *t-test Analysis of the Mean Need Ratings of Male and Female University Undergraduates on the Planning Competencies in Cassava Farming*

Gender	N	$\bar{x}$	SD	df	t	p	Decision
Male	113	4.81	0.40	248	-1.36	0.18	Not Significant
Female	137	4.87	0.34				

The result in Table 4 showed a t-value of -1.36 and a p-value of 0.18 at 0.05 alpha levels. Since the p-value was greater than the alpha value, the null hypothesis was accepted, showing that there was no significant difference between the mean responses of male and female undergraduates on the planning competencies needed in cassava farming for achieving the SDGs of no poverty in Delta State.

Hypothesis Two: There is no significant difference between the mean responses of male and female undergraduates on the innovation competencies needed in cassava farming for achieving the SDGs of no poverty in Delta State.

Table 5: *Summary of t-test Analysis of the Mean ($\overline{x}$) Need Ratings of Male and Female University Undergraduates on the Innovation Competencies in Cassava Farming*

Sex	N	$\bar{x}$	SD	df	t	p	Decision
Male	113	4.86	0.35	248	1.16	0.25	Not Significant
Female	137	4.80	0.40				

The t-test analysis of the result in Table 5 revealed a t-value of 1.16 and a p-value of 0.25 at the 0.05 alpha levels. As a result, the null hypothesis was accepted because the p-value was higher than 0.05. This implies that there was no significant difference between the mean responses of male and female undergraduates on the innovation competencies needed in cassava farming for achieving the SDGs of no poverty in Delta State.

Discussion

The findings have shown that undergraduates needed improvement in 15 competencies to enable them to plan for cassava farming to achieve the sustainable development of no poverty in Delta State. They include the ability to draw up a budget for the production of the business, develop a cassava production programme for a planting season, identify different records to be kept such as records of sales, and equipment, predict the required inputs over a production period, outline specific objectives of the business, predict income from production over a production period, among others. These planning competencies are in line with those identified by Okere and Onyechi (2010), which include the ability to identify the source of funding, and appropriate market, employ suitable sales representatives, identify reliable sources of supply for raw materials, and plan for contingencies, among others. They also conform to those identified by Akinbola and Ikuemonisan (2021), and Oladoyin *et al.* (2022) which include the ability to develop a production programme, predict the required inputs over a production period, estimate

and predict income from production over a production period, estimate and predict production costs over a production period, among others.

The remaining three items, which are the ability to choose the best production facilities, make arrangements for regular supplies, and predict targeted customers or markets for cassava, had negative INI, implying that undergraduates do not need improvement in those competencies. It therefore implies that undergraduates can effectively choose the best production facilities, make arrangements for regular supplies, and predict targeted customers or markets for cassava. Furthermore, there was no significant difference between the mean responses of male and female undergraduates on the planning competencies needed in cassava farming for achieving the SDGs of no poverty in Delta State. This simply shows that university undergraduates' need for planning competencies in cassava farming is independent of their gender. Results from this study revealed that undergraduates needed improvement in all the innovation competencies in cassava farming in Delta State. They include the ability to invent new cassava production methods, better ways of processing cassava, better storage facilities for cassava, the use of imagination to manipulate production efficiency, and others. The needed innovation competencies agree with those highlighted by Lindow et al. (2023) which included the ability to develop the necessary innovative competencies in the areas of facilitating and utilizing new knowledge acquisition modes, adoption of problem-solving strategies, integration of knowledge from various sources, utilization of self-directed learning, and knowledge extension through elaborate creative expression.

The findings from this study are also in line with Mbarga Evouna *et al*. (2024) who asserted that the innovation competencies needed in cassava farming involve the ability to think creatively that is, using imagination to manipulate instruments or variables, formulate models, discover possibilities, and construct objects and images that never existed before to promote cassava production. However, there was no significant difference between the mean responses of male and female undergraduates on the innovation competencies needed in cassava farming in Delta State. This simply shows that the innovation competencies needed in cassava farming is not influenced by the gender of undergraduates.

Conclusion

The findings of this study indicate that university undergraduates in Delta State require significant improvement in entrepreneurial competencies related to planning and innovation for successful entry into cassava farming. The study identified specific areas where these competencies are lacking and proposed strategies for enhancing them. Implementing these strategies can help better prepare undergraduates for entrepreneurial activities in cassava farming, ultimately contributing to poverty reduction in Delta State.

Recommendations

Based on the findings of the study it was recommended that:

1. Universities in Delta State should implement specific training programs focusing on the identified entrepreneurial competencies in planning and innovation for cassava farming. The focus should be on areas with the highest improvement needs, such as budgeting, production planning, and the development of innovative cassava farming methods.
2. Given that there was no significant difference between male and female undergraduates in terms of competency needs, it is recommended that training programs be designed to be gender-inclusive, ensuring that both male and female students are equally equipped with the necessary competencies in cassava farming.
3. Since geographic location (rural vs. urban) could affect the accessibility and applicability of entrepreneurial skills, the state-owned universities in Delta State should provide tailored support for students from rural areas to ensure they receive the same opportunities and resources as their urban counterparts in acquiring competencies in cassava farming.
4. To address the improvement needs in both planning and innovation competencies, practical workshops, and field experiences should be integrated into the Agricultural Education and Crop Science programs. This will help students apply their entrepreneurial knowledge directly to cassava farming activities, ensuring they gain the hands-on experience necessary to excel in the field.
5. Based on the identified needs for improvement in competencies, universities should prioritize the provision of practical tools, training manuals, and other resources that directly support the development of the specific entrepreneurial competencies needed in cassava farming.

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