



**Research Article**

**DEVELOPMENT AND VALIDATION OF A SCIENCE EDUCATION PACKAGE FOR EMPOWERING THE RURAL WOMAN WITH ENTREPRENEURIAL SKILLS FOR PERSONAL AND NATIONAL DEVELOPMENT**

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**ABSTRACT**

Every nation of the world is endowed with one resource or the other, in terms of minerals, water and human resource. The contributions of human resources to national growth and development depends on the training received and this helps to put other resources into effective use. In Nigeria past neglect on woman education has led to several rural women not educated, women are said to be at a disadvantaged position. Access to education, school provisions and relations of contents to gainful employment are some of the factors militating against women empowerment (Okeke,2006; Ezeudo, 2008). Education to the Nigeria government is the key to national development; it Boosts nation's economy and self reliance. Actualization of these leads to transformed education but it is far from this because many of the citizens are illiterate especially women. Science Education is expected to produce informed citizens of good quality equipped with appropriate knowledge and high technical skills groomed with practical dexterity to use their hands, heads and hearts for self-reliance and National development. Science has been acknowledged all over the world as a tool for national development and it is a necessity in all areas of human endeavor. Current development in science has greatly affected the lives of every human being such that if the knowledge of science is ignored, it means that man lives in an empty and meaningless world therefore the rural woman should not be left out of science Knowledge. Science also has contributed to human lives in areas such as health, nutrition, agriculture, transportation, material and energy production and industrial development. It is in view of this that the authors chose to develop and validate a science education package for the rural woman to acquire science knowledge and skills for entrepreneurship to better their lives and for national development.

This paper examined entrepreneur skills in science that will be taught to rural women as a skill acquisition that are suitable for entrepreneurial Endeavors, it also looked at how the rural woman will have personal and national development through such skills, that is a process of providing individuals with the ability to recognize commercial opportunities, self-esteem, knowledge and skills to act on them.

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**INTRODUCTION**

Rural women are those that live in an area called village where they often have the same culture and most of them being farmers are illiterates. Rural women although are active agents of economic and social change, are financially ill-disposed and so cannot often boast of having landed properties, having good medical treatment or good nutrition and well being of the family.

Most of them lack adequate knowledge especially in science to transform their lives and that of their society. Although rural women produce agricultural products, they are still poor because most of the products belong to men and often their rich environments are under utilized to earn money. Unlimited access to credit, health care education, and gainful employment are some of the factors militating against rural women empowerment.

Empowerment is an authority or power given to someone to do something. It is the process of becoming stronger, more confident, especially in controlling one's life and claiming

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one's right. It is the process of self development by using the resources in their immediate environment to make life better. Empowerment of rural women with knowledge of skills in science education to change their income power cannot be over emphasized because according to Bokoyeibo (2018) rural women make a quarter of the world's population, and are key contributors to agricultural production and food security. To this researcher, rural women have not been seen with prior business or knowledge of entrepreneurship skill even though, they have succeeded in some micro businesses. He finally stressed that if a rural woman is empowered, her generation and family are empowered. This is because education especially in science is key to national development and also enhances independence, boosts a nation's economy especially in Nigeria where there are problems of unemployment and illiteracy in adult population e.g rural women. The word science originates from a Greek word 'scere' which means to know through exploration of ways to understand the world and making it a more comfortable place to live. Science has turned the whole world into a small global village. The authors of this paper intend to give a science education package for entrepreneurial skills development through hands-on activities on skills for micro business that will enhance their daily living. Entrepreneur originates from a French word 'entrepredre' which means 'to undertake'. To Ebele and Davou (2009) entrepreneurial skills are the acquisition of skills that would enable individuals to be self-employed and self-reliant, thereby creating jobs, wealth and rendering public services that are unique and essential and consequently contributing to national development. These skills include both the cognitive abilities needed to make informed judgment leading to creative and effective activity to meet challenges which are varied. It is therefore, a process of creating something different with value by devoting the necessary time, assuming the accompanying financial psychic, social risks and of personal satisfaction. It occurs when one develops a new approach to old one, or give the market a new product or services that are unique.

Entrepreneurial skills in Biology includes Horticulture, animal production, food and beverages production, fish farm, rabbitary, snail farming, mushroom, earthworm poultry etc. Entrepreneurial skills education is a functional education which involves active participation by rural women in order to create something different with value from their immediate environment for personal satisfaction and development.

To develop entrepreneurial skills in the rural women is to be able to look inwards and turn potentials into reality (Adegboye, 2009). In this case, when rural women acquire knowledge in Biology concepts and come up with initiation to produce things that can earn or generate money and improve personal life and community by stimulating investments and innovation it is termed development. It also will encourage effective use of resources from their local environment to avoid wastes. These entrepreneurial skills will be acquired through training and knowledge gained to be transformed to skills that will fight poverty and increase economy of the nation and so bringing about development which is positive change by turning the nation from much of a buyer to more of a seller.

#### **Statement of the problem**

This study makes science education more practical, personal and natural in a bid to make it relevant to the rural women.

Past neglect has left most rural women in Nigeria illiterate, poor and lack social amenities. Rural women lack adequate science knowledge for self and nation's development (Bokoyeibo 2018). A true democratic culture cannot be attained with a preponderance of illiteracy especially with the rural women who make up about 33% of Nigeria population.

The question that comes to mind is can the rural women financial status be changed by entrepreneurial skills acquisition through science education package (for training)? This study sets out to develop and validate a science package which will provide entrepreneurial skills for rural women's personal and National development.

#### **Purpose**

The purpose for this study is to develop and validate a science education package for acquisition of entrepreneurial skills for personal and National development.

#### **The objectives are to**

1. Establish the trends in rural women entrepreneurial skills demonstration
2. Empower rural women with entrepreneurial skills
3. Use these skills to produce materials or produce that will generate money
4. Perform some hand-on activities that will lead to fish farm, poultry, earthworm horticulture and beverages
5. Improve standard of living inform of personal satisfaction and National development.
6. Research Questions (*As a heading*)

#### **The following research questions guided the study**

1. What are the trends in rural women entrepreneurial skills in fish farming, poultry farm, earthworm horticulture and beverages for nutrition
2. What types of entrepreneurial skills are present in rural women?
3. What are the contributions/effects of entrepreneurial skills to rural women development?
4. What role will the acquired entrepreneurial skills play in the nation's development?

## **METHODOLOGY**

The study adopted a combination of Survey and experimental designs. The survey method, used the oral interview to ascertain the type of entrepreneurial skills possessed by the rural women and their competence. A quasi-experiment was adopted specifically the one group pretest post-test design which had experimental and control group each. The experimented group was taught the science education package and also undertook the performance on how to execute fish farming, poultry farms, earthworm, beverage production and horticulture, while the control group was not taught the package but was examined on how to perform these activities.

The population of the study was comprised of all rural women in Plateau, Nigeria and in figure were 47,009 adult females living in 15,638 households. The sample of the study was 145, 45 were for survey while 100 was for experimental study.

Simple random sampling of hat and draw was used to select 3 villages out of 139 villages. Cluster sampling was used for selecting the households in 16 square blocks giving rise to 600 sampling units. A table of random number was used to select 150 blocks and every household that fell within those blocks

were used for the study. All the women in these blocks formed the sample and they were 100 in number.

The instrument was called rural women performance of entrepreneurial skills on some Biology concepts (RWPESSBC). This instrument was made up of 5 essay questions requiring the rural women to demonstrate how fish farm, poultry farm, earthworm, horticulture and beverage are made. These questions were developed from the activities on entrepreneurial skills that were carried out. This instrument was validated by 2 experts from science education department and Adult education unit of foundation department. Face and content validity was ensured by the experts.

The reliability was determined by usage of Test-retest. A single test was administered for the experiment to the same group twice in close succession of 84 hours which was later correlated and the correlation coefficient of 0.82 was determined

The researchers visited villages to collect the data. Oral interview was carried out for base line data. The control group did not receive treatment but were taught with lecture method while the experimental group was trained through instructions for 4 weeks on the various farm production processes. On fish, poultry, earthworm, horticulture and beverage productions. The differences due to application of the experimental treatment were then determined by comparing. The statistics used were mean scores, and standard deviations

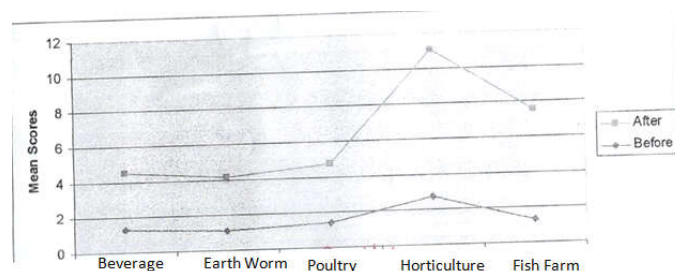
## RESULTS AND DISCUSSIONS

The data to answer the research questions 1-4 are presented on tables 1&2 and on figures 1 and 2.

**Table 1** Trends in the skills of Rural Women in beverage, earth worm farming, fish farming, horticulture, poultry farming.

Variables	Beverages		Fish farming		Poultry farming		Horticulture		Earth worm	
	B	A	B	A	B	A	B	A	B	A
Maximum Scores attainable	6	6	6	6	6	6	20	20	17	17
Maximum Scores attained	4	6	2	6	3	6	0	15	3	13
Minimum Scores attainable	0	0	0	0	0	0	0	0	0	0
Minimum Scores attained	0	1	0	1	0	1	1	3	0	1
Mean Score	1.29	3.23	1.13	3.0	1.44	3.30	2.73	8.32	1.28	6.29
Mode	0	3	1	3	2	3	3	8	1	3
Standard Deviation	1.45	1.50	0.7	1.3	1.12	1.43	1.93	3.73	0.97	2.96

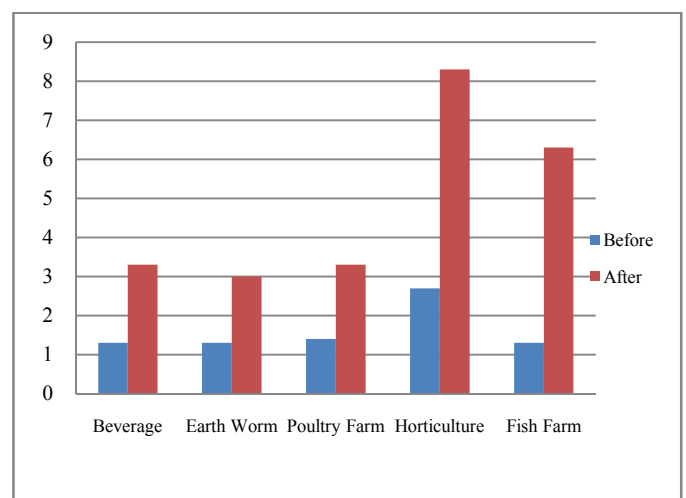
Key B = Before treatment  
A = After treatment



**Figure 1** A line graph showing the trends of Mean change in Entrepreneurial Skills of the Rural Women in Beverage Production, Earth Worm, Poultry Farming, Horticulture and Fish Farm. ( For research Question One).

**Table 2** Effects of the Science Education Package on the Entrepreneurial Skills of the Rural Women in Beverage Production, Earth Worm Production, Poultry Farm, Horticulture and Fish Farm

Variables	Beverages		Fish farming		Poultry farming		Horticulture		Earth worm	
	B	A	B	A	B	A	B	A	B	A
Maximum Scores attainable	6	6	6	6	6	6	20	20	17	17
Maximum Scores attained	4	6	2	6	3	6	0	15	3	13
Minimum Scores attainable	0	0	0	0	0	0	0	0	0	0
Minimum Scores attained	1	1	1	1	0	0	0	2	0	1
Mean Score	1.3	3.3	1.3	3.0	1.4	3.3	2.7	8.3	1.3	6.3
Mode	0	3	1	3	2	3	3	8	1	3
Standard Deviation	1.4	1.5	0.7	1.3	1.1	1.4	1.9	3.7	1.9	2.9



**Figure 2** Bar Chart showing the effects of the Science Education Package on the Entrepreneurial Skills of the Rural Women in Beverage Production, Earth Worm Production, Poultry Farm, Horticulture and Fish Farm. (To answer research question three).

From the analyses, it showed that

1. Rural women possess some skills before treatment
2. There were positive changes in the skills of rural women in all the farm production
3. The entrepreneurial skills acquired were relevant for rural women self development through money generation and this helped improve Nigerian economy

The results revealed that the most developed entrepreneurial skills were those on the horticulture where plants, ornamental and fruits, vegetables were cultivated for sale. And also the skills were not so complex, more so that rural women are mostly farmers. This finding is in agreement with Kurawa (2016) and Bokoyeibo (2018) who are in agreement that exposure of rural women to skills development can improve their performance, well being and economic status. It was also found out that rural women were motivated to perform on tasks as they observe others do it, they repeated the acts others were engaged in as they never wanted to be left behind. Table 2 shows the effects of the science education package on entrepreneurial skills the rural women in a positive manner.

## CONCLUSION AND RECOMMENDATION

The study revealed that rural women can be Trained on entrepreneurial skills to better their lives and that of the nation. It was also discovered that science education is necessary for rural women daily activities because rural women need to be educated in all spheres of life.

This means that science education helps to develop a total person, build their skills and capacities.

### *The researchers therefore recommend that*

1. This type of entrepreneurial skills training should be extended to other areas of the women interests.
2. Science education knowledge to be encouraged for rural women to increase their living standard and the nation's economy.
3. Women education centers to adopt the use of this developed science education package.

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