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Digital Electronics Small and Medium Scale Enterprise Establishment for Employment Generation in Rivers State

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Abstract

The major objective of this study is to identify the technical and entrepreneurial skills that electronics technicians possessed to establish small and medium-scale enterprises in digital electronics, thereby creating job opportunities in Rivers State. The study was prompted by the concerning unemployment rates among electronics technicians in Rivers State. The study has three objectives, each with three research questions and three null hypotheses to guide its examination. The study used a survey research approach and included 45 participants from Rivers State: 30 electronics technologists and 15 electronics technicians. Data collection was carried out through a structured questionnaire containing 34 items divided into four sections (A-D). Participants were asked to assign a rating on each item on a 4-point scale: Strongly Required (4), Required (3), Not Required (2), and Strongly Not Required (1). The questionnaire's reliability was assessed using Cronbach Alpha, resulting in a reliability coefficient of .98. A total of 45 completed questionnaires were distributed and returned within a span of three days. As a consequence, the response rate was 100%. The mean and standard deviation were used to evaluate the research questions. Items with a mean score below 2.50 were deemed Not Required, while those with a mean score of 2.50 or higher were deemed Required. The t-test was used to evaluate the three null hypotheses with a significance level of.05. The study's findings revealed that electronics technicians in Rivers State require proficiency in troubleshooting modern electronic devices. Based on these results, the recommendations are as follows: a retraining program should be organized by the Rivers State government for electronics technicians on skills digital electronics maintenance. Also, entrepreneurship skills should be embedded in the retraining program to equip the electronics technicians with entrepreneurial skills needed for small and medium size digital electronics business establishment and smooth running, for self-employment.

Keywords: Competence, Digital, Electronics**,** Entrepreneurial, Technical,

Introduction

The working class, traders, farmers, fishermen, retirees, and others have suffered greatly as a result of the high unemployment rates among graduates of Nigeria's universities, polytechnics, colleges of education, and technical colleges, as well as the country's skyrocketing cost of living. These consequences include widespread poverty, youth unrest, cult activities, kidnappings, and various other societal problems in the country. According to Ayoade & Agwu (2016), unemployment is a significant and widespread issue in modern economies worldwide, and Rivers State of Nigeria is no exception.

One of Nigeria's 36 states, Rivers State is a center of activity and is situated in the southern part of the nation. With 5,198,716 residents, the state is the sixth most populated in Nigeria, according to the 2006 census. The nation's oil sector depends heavily on Port Harcourt, its capital and largest metropolis. Geographically, Rivers State borders the Atlantic Ocean on the south, Imo, Abia, and Anambra States on the north, Akwa Ibom State on the east, and Bayelsa and Delta States on the west. The state is predominantly inhabited by three indigenous ethnic groups—the Ijaw, Ikwerre, and Ogoni—and its residents are often referred to as "Riverians." Despite its rich natural resources and industrial significance, the state faces a pressing challenge: high unemployment rates among technicians. A substantial portion of the population grapples with poverty and unemployment, while the region faces substantial challenges in terms of infrastructure and malnutrition (Ohale, 2018). Addressing the persistent unemployment issue in Rivers State can be greatly achieved through skill acquisition and the development of small and medium-sized enterprises (SMEs).

Small and medium-sized enterprises (SMEs), sometimes referred to as small businesses, are companies that employ a limited workforce and do not achieve high sales volumes (Uche, 2018). As stated by Deen (2003), the development, growth, progress, and evolution of small and medium-sized businesses (SMEs) have been essential to the success of many nations, particularly established and some emerging countries like the US, China, and India. Deen also emphasized that in these countries, SMEs constitute over 98 percent of all enterprises and play a significant role in generating more than 65 percent of the overall employment opportunities. Small-scale enterprises contribute to local economies by offering employment opportunities to local residents and providing products and services to the community. However, during economic recessions, the Small Business Administration (SBA) notes that SMEs can also be responsible for a substantial number of employee layoffs. Achieving these positive impacts requires the presence of entrepreneurial competencies.

Entrepreneurial competencies refer to a set of skills and abilities that individuals or entrepreneurs need to successfully establish, operate, and sustain business ventures, such as SMEs (Moses, 2017). Moses also emphasized that these competencies are the essential skills that enable an entrepreneur to initiate, organize, and proficiently manage an enterprise while achieving its intended goals. These competencies are vital for entrepreneurs to effectively launch and manage their business ventures.

Technical competencies for a digital electronics enterprise include installation, troubleshooting, signal trapping, component replacement, repairs etc, of digital electronics devices (Flight, 2016). Flight (2016) went further to note that technical competencies encompasses the installation and general maintenance of electronics equipment/devices. The processes for the maintenance of any electronics device begins with troubleshooting. Troubleshooting is a type of problem-solving approach. According to Hinckley (2012), troubleshooting entails a logical and systematic investigation to identify the origin of an issue with the goal of resolving it and restoring the functionality of the product or process. This is done not downplaying the importance of proper management of the establishment.

Managerial competencies are essential for the efficient operation of small and medium-sized enterprises (SMEs). These competencies encompass the strategies used to effectively utilize both human resources and materials in order to optimize output within an organization, as highlighted by Onoh and Moses (2015). In the context of SMEs, the management of human and material resources to combat poverty and promote development relies heavily on interpersonal competencies (Czaja, 2017). This is particularly significant because Small and Medium Enterprises (SMEs) play a pivotal role in the economy of any society due to their substantial impact on job creation and national production levels.

The creation of employment is an integral part of societal advancement. As people enter the world, they bring with them diverse needs that generate opportunities for others to secure work (Sandra, 2019). Sandra (2019) further noted that job creation serves as a cornerstone for any economic recovery strategy, encompassing both short-term initiatives with immediate outcomes and the establishment of more enduring livelihoods within the public or private sectors. The creation of employment for electronics technicians can not be possible without proper training from technical colleges.

Technical colleges prepare students for further or higher education by teaching them the employability and technical skills necessary to enter the workforce. While studying, it exposes people to workplace-like settings and methods of operation, providing them with practical work experience (McConnell, 2018).

Statement of the Problem

The progress and growth of small and medium size digital electronics ventures by electronics technicians in Rivers State have come to a standstill, appearing distant and unattainable. The people are mired in extreme poverty and a wretched existence due to widespread joblessness. This dire and disheartening situation spares no one. Poverty rates, stemming from unemployment, have reached staggering levels. Even university graduates, polytechnic graduates, and those from colleges of education and technical colleges have been forced into undesirable roles, such as becoming political henchmen, bus conductors, motorcyclists (commonly known as Okada riders), or tricycle operators (Keke riders) in order to eke out a living. They have abandoned the fields they

studied in, fields that could have enabled them to establish small and medium-sized enterprises for job creation. Businessmen and women have shuttered their enterprises and joined the ranks of the unemployed and impoverished, perhaps due to a lack of financial resources or the necessary entrepreneurial skills needed to establish and manage small and medium-sized enterprises. What impedes these various groups from creating small and medium-sized enterprises for the purpose of generating employment? Does this mean they lack the technical and entrepreneurial proficiencies required for the establishment and sustainability of SMEs? Given this backdrop, there is a pressing need to identify the technical and entrepreneurial competencies that electronics technicians should possess in order to establish digital electronics small and medium-sized enterprises for the purpose of job creation in Rivers State.

Purpose of the Study

The main purpose of the study is to determine the technical and entrepreneurial abilities of electronics technicians in order to construct small and medium-sized digital electronics businesses and create jobs in Rivers State. Specifically, this study aims to:

1. determine technical skills possessed by electronics technicians for digital electronics small and medium scale enterprise establishment for employment generation in Rivers State.
2. determine managerial competencies possessed by electronics technicians for digital electronics small and medium scale enterprise establishment for employment generation in Rivers State.

Research Questions

The research was directed by the following questions:

1. What technical skills do electronics experts need to build digital electronics small and medium-sized businesses in Rivers State in order to create jobs?
2. What managerial abilities do electronics specialists possess for the formation of small and me dium-sized digital electronics businesses that create jobs in Rivers State?

Null Hypotheses

The following hypotheses were raised and tested at 0.05 level of significance

1. The mean scores of electronics technicians and technologists on repair skills for digital electronics small and medium-sized business establishment for job generation in Rivers State do not significantly differ from one another.
2. A significant difference does not exist between the mean scores of electronics technologists and technicians on managerial competencies possessed by electronics technicians for digital

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electronics small and medium scale enterprise establishment for employment generation in Rivers State.

Methodology

The study utilized a descriptive survey research design, focusing on data collection and analysis involving electronics technologists and technicians who are practicing electronics works in Rivers State. Alio (2008) defines a descriptive survey as a research approach that examines a subset of individuals or items, regarded as representative of a larger group or the entire population, through systematic data collection and analysis. This research was conducted in Rivers State, utilizing a structured questionnaire containing 34 items. The questionnaire employed a 4-point response scale, categorized as Strongly Possessed (4), Possessed (3), Not Possessed (2), and Strongly Not Possessed (1). The Cronbach Alpha technique was used to assess the instrument's reliability, and the results showed a high reliability coefficient of 0.89. The target population comprised 45 individuals, including 30 technologists and 15 electronics technicians in the Rivers State. Due to the small size of the population, sampling was unnecessary. All 34 distributed questionnaires were completed and returned within three days, achieving a 100% response rate. To answer the study questions, data was analyzed by computing mean scores and standard deviations. Items with mean scores of 2.50 or higher were categorized as required, while those below 2.50 were considered not required. Additionally, T-tests were used to assess three null hypotheses at a significance level of 0.05.

Results

The findings of the research have been organized and displayed in tables corresponding to the research questions and hypotheses.

Research Question 1: What technical skills do electronics experts need to build digital electronics small and medium-sized businesses in Rivers State in order to create jobs?

Table 1: Mean ($\bar{x}$) with standard deviation scores on technical skills do electronics experts need to build digital electronics small and medium-sized businesses in Rivers State in order to create jobs

S/N	Technical Competencies	Technologists (N=30)		Technicians (N=15)		Aggregate (N=45)		Decision
		$\bar{x}_1$	SD_1	$\bar{x}_2$	SD_2	$\bar{x}$	SD	
1	Troubleshooting faults	3.50	0.50	3.46	0.53	3.48	0.52	Possessed
2	Assembling of the digital electronics system	3.49	0.53	3.41	0.49	3.45	0.51	Possessed
3	Disassembling of the digital electronics system (Decoupling)	3.50	0.50	3.65	0.49	3.58	0.49	Very Possessed

4	Ability to test capacitors, diode, transistors with multi-metre	3.50	0.53	3.43	0.52	3.47	0.53	Possessed
5	Fixing faults relating to no sound distribution	3.47	0.53	3.43	0.49	3.45	0.51	Possessed
6	Fixing faults in power board	3.50	0.50	3.46	0.53	3.48	0.52	Possessed
7	Fixing no picture/image transmission problem	3.50	0.50	3.44	0.49	3.47	0.49	Possessed
8	Fixing faults in Bluetooth sensitivity	3.51	0.50	3.39	0.52	3.45	0.51	Possessed
9	Fix faults in USB compartment	3.51	0.50	3.45	0.50	3.48	0.50	Possessed
10	Fixing faults in digital electronics video/audio terminals	3.46	0.53	3.46	0.50	3.46	0.52	Possessed
11	Repair faults in AC power terminal	3.49	0.50	3.45	0.50	3.47	0.50	Possessed
12	Fixing faults in Bluetooth sensitivity	3.49	0.50	3.42	0.52	3.46	0.51	Possessed
13	Fixing faults in digital electronics power board	3.49	0.50	3.43	0.52	3.46	0.51	Possessed
14	Removal and replacement of diodes, capacitors and resistors in digital electronics	3.49	0.53	3.43	0.49	3.46	0.51	Possessed
	Grand Mean/SD	**3.49**	**0.51**	**3.45**	**0.51**	**3.47**	**0.51**	**Possessed**

Table 1 highlights that all 14 items have mean values ranging from 3.45 to 3.58, corresponding to the response categories of "Possessed" (P) and "Very Highly Possessed" (VHP). Notably, Item 13 has the highest mean value of 3.58, indicating it is deemed "Very Highly Possessed" (VHP) by electronics technicians for establishing small and medium-sized enterprises in digital electronics to foster employment generation. Meanwhile, Items 11, 12, and 14 through 24 have mean values between 3.45 and 3.48, categorizing them as "Highly Required" (HR) competencies essential for setting up such enterprises. The standard deviation for these items falls within a narrow range of 0.49 to 0.53, demonstrating consistent responses from both electronics technologists and technicians. This consistency underscores the shared agreement on the importance of these technical competencies possessed by electronics technicians for digital electronics small and medium scale enterprise establishment for employment generation in Rivers State.

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Research Question 2: What managerial abilities do electronics specialists possess for the format ion of small and medium sized digital electronics businesses that create jobs in Rivers State?

Table 2: Mean ($\bar{x}$) with standard deviation scores on managerial abilities do electronics specialists possess for the formation of small an d medium-sized digital electronics businesses that create jobs in Rivers State.

S/N	Managerial Competencies	Technologists (30)		Technicians (15)		Aggregate (45)		
		$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	Dec
1	The capacity to oversee human and material resources within a business	3.0	1.0	2.5	1.2	2.8	1.1	Possessed
2	Ability to organize ideas and concepts related to the trade	3.1	1.02	2.7	1.1	2.9	1.06	Possessed
3	Ability to plan daily activities in the business	3.2	0.98	3.0	0.86	3.1	0.92	Possessed
4	Ability to accommodate and plan for changes in technology	3.3	0.92	2.9	1.0	3.1	0.96	Possessed
5	Skills in time management	2.9	1.01	2.9	0.97	2.9	0.99	Possessed
6	Ability to use feedback from customers for improved performance	3.21	0.93	3.05	0.87	3.13	0.90	Possessed
7	Ability to plan for feasibility study for the business	3.3	0.74	3.04	1.0	3.17	0.87	Possessed
8	Ability to make plans for payment of workers	3.04	0.97	3.1	0.85	3.07	0.91	Possessed
9	The capability to create plans for recruiting staff	3.1	0.95	3.13	0.92	3.12	0.94	Possessed
	Grand Mean/SD	**3.14**	**0.96**	**2.92**	**0.98**	**3.03**	**0.97**	Possessed

Table 3 reveals that all 10 items achieved mean scores between 2.8 and 3.17, highlighting their importance as key managerial abilities required by electronics technicians for establishing small and medium-sized enterprises in the digital electronics sector to promote employment opportunities. Moreover, the standard deviations, ranging from 0.92 to 1.10, reflect a strong level

of agreement among respondents on the significance of these managerial competencies possessed by electronics technicians for digital electronics small and medium scale enterprise establishment for employment generation in Rivers State**.**

Null Hypothesis 1: The mean scores of electronics technicians and technologists on repair skills for digital electronics small and medium-sized business establishment for job generation in Rivers State do not significantly differ from one another.

Table 3: summary of t-test mean scores of electronics technicians and technologists on repair skills for digital electronics small and medium-sized business establishment for job generation in Rivers State do not significantly differ from one another

Responses	N	$\bar{x}$	SD	D.F	t-cal	t-crit	Remark
Technologists	30	3.07	1.02				
				43	0.13	1.684	Not Significant
Technicians	15	3.07	1.03				

The information displayed in Table 3 reveals a calculated t-value of 0.13, indicating that the t-calculated value is lower than the critical t-value of 1.684 at 43 degrees of freedom. Therefore, the null hypothesis is not rejected. This suggests that both electronics technologists and electronics technicians hold a consistent viewpoint on the necessity of technical competencies possessed by electronics technicians for digital electronics small and medium scale enterprise establishment for employment generation in Rivers State.

Null Hypothesis 2: Significant difference does not exist between the mean scores of electronics technologists and technicians on managerial competencies possessed by electronics technicians for digital electronics small and medium scale enterprise establishment for employment generation in Rivers State.

Table 4: t-test summary for significant difference in between the mean scores of electronics technologists and technicians on managerial competencies required by electronics technicians for digital electronics small and medium scale enterprise establishment for employment generation in Rivers State

Variables	n	$\bar{x}$	SD	D.F	t-cal	t-crit	Remark
Electronics technicians	30	3.49	0.51				
				148	0.33	1.96	Not Significant
Electronics technologists	15	3.45	0.51				

The information provided in Table 4 indicates that the t-values calculated for all the statements related to managerial competency items were lower than the critical t-value of 1.96. This implies that there is no statistically significant difference between the average scores of electronics technologists and technicians in terms of the managerial skills needed for establishing

small and medium-scale digital electronics enterprises to create jobs in Rivers State. Consequently, we did not reject the null hypothesis**.**

Discussion of Finding

The results presented in Table 1 showed that Troubleshooting faults, Assembling of the digital electronics system, Disassembling of the digital electronics system (Decoupling), Ability to test capacitors, diode, transistors with multi-metre, Fixing faults relating to no sound distribution, fixing faults in power board, Fixing no picture/image transmission problem, and Fixing faults in Bluetooth sensitivity among others are technical competencies possessed by electronics technicians for digital electronics small and medium scale enterprise establishment for employment generation in Rivers State. This discovery aligns with the conclusions drawn by Flight (2016) who noted that technical competencies for a digital electronics enterprise include installation, troubleshooting, signal trapping, component replacement, repairs etc, of digital electronics devices.

The results presented in Table 2 indicates that capacity to oversee human and material resources within a business, Ability to organize ideas and concepts related to the trade, Ability to plan daily activities in the business, Ability to accommodate and plan for changes in technolog, skills in time management, Ability to use feedback from customers for improved performance, and Ability to plan for feasibility study for the business among others are managerial competencies possessed by electronics technicians for digital for digital electronics small and medium scale enterprise establishment for employment generation in Rivers State. This discovery aligns with the findings of a study conducted by Onoh and Moses (2015) who noted that in the context of SMEs, the management of human and material resources to combat poverty and promote development relies heavily on interpersonal competencies.

Conclusion

The high unemployment rate among graduates of technical colleges is a cause for concern. It is troubling that many of these graduates have resorted to jobs such as taxi drivers, motorcycle riders, tricycle operators, bus conductors, and, in some cases, even getting involved in illegal activities associated with politicians. This has contributed to an increase in youth unrest and various social issues, all driven by the need for survival. Given these concerns, this study was undertaken to identify the entrepreneurial and technical skills necessary for electrical and electronics technical college graduates to establish and sustain small and medium-sized enterprises in the electrical and electronics sector. Consequently, the study focused on identifying the troubleshooting, repair, and maintenance competencies required by electronics technicians to establish digital electronics small and medium-scale enterprises for the purpose of job creation in Rivers State, and it provides recommendations based on these findings.

Recommendations

In light of the study's results, the following recommendations have been put forward:

1. A retraining program should be organized by the Rivers State government for electronics technicians on skills digital electronics maintenance.
2. Entrepreneurship skills should be embedded in the retraining program to equip the electronics technicians with entrepreneurial skills needed for small and medium size digital electronics business establishment and smooth running, for self employment.

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