

# INNOVATION AND SUSTAINABILITY OF SMALL AND MEDIUM SCALE ENTERPRISES IN ENUGU METROPOLIS

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## **Abstract**

*The study was on innovation and sustainability of SMEs in Enugu metropolis. Small and Medium Enterprises are the driving force of industrial development globally, especially in developing economies due to their numerous contributions in terms of employment generation, export promotion and use of local raw material among others. Innovation has greatly contributed to sustainability of the SMEs. The major objective of the study was to examine innovation and sustainability of SMEs, while the following specific objectives formulated were to: identify product innovation on the circular economy of small and medium enterprises in Enugu metropolis, ascertain technological innovation on management behavior on small and medium enterprises in Enugu metropolis. Methodology research design was used and population of the study was 300 made up of owners and workers and 35 SMEs. The entire population was used, so determination of sample size not necessary. The researcher found out that product innovation had significant positive effect on the circular economy of small and medium enterprises in Enugu metropolis, with the statistical evidence ( $\chi^2$  cal. Value 382.31 >  $\chi^2$  tab. value 9.49). The recommended that for SMEs to be sustainable it must have product innovation, especially adopting those methods that will not affect the environment negatively.*

***Keywords: Innovation, sustainability, SMES, product innovation, technological innovation***

## **Introduction**

Schumpeter (1934) believes that innovation is the use of an invention to create a new commercial product or service that is incidental to creating new demand and thus wealth. Innovation is the key to the growth of small and medium enterprises as it provides firms with a competitive advantage over other in the industry. Allocca and Kessler, (2006), posit that the history of industrial growth in developed and developing countries has shown that small and medium enterprises are the

driving force of industrial development due to their numerous contributions in terms of technological innovations, employment generation, export promotion and so on. Small and medium enterprises have become the focus of industrial policy in recent times as shown by the Central Bank of Nigeria (CBN, 1997). In the same light, they have become the pivot of economic growth and development in many nations. Fatai (2016), submits that in Nigeria, the small and medium enterprises sub-sector have been expanding, especially since the mid-1980s, following the introduction of the Structural Adjustment Programme (SAP) which led to rapid deindustrialization of the economy forcing many large scale enterprises to lay off a large portion of their work.

Carls and Vereeck, (2016), opine that sustainability emphasizes the satisfaction of people's basic need so that they may enjoy a better quality of life without compromising the quality of life of future generations. Carls and Vereeck, (2014), state that sustainability means making decisions that integrate and incorporate the main dimensions of sustainability and is important and urgent as the recognition of its value is fundamental to implementing sustainable practice that reduce the possible risks of the small and medium enterprises and increase their positive reputation, resulting in a positive relationship with stakeholders and an increase in customer loyalty and consequently, economic growth. Allocca and Kessler (2015), stated that a sustainable business is the one that operates in the interest of all current and future stakeholders in a manner that ensures the long-term health and survival of the business and its associated economic, social, and environmental systems. Dailey and Huang (2017), argue that small and medium enterprises should assess, monitor, and potentially develop strategies to accommodate widespread sustainability reporting and to proactively adapt to overall sustainability demands. They believed that by integrating

sustainability into core business practices, the firm goes beyond mere legal compliance to enhance relations with wider stakeholders across a range of social, economic and environmental concerns.

Hagedoom, (2014), posits that innovation is the best way for stimulating growth in a firm. Hagedoom states that the most innovative firms realize higher turnover of products and services within a period of time. He also added that in order for firms to grow they have to adopt an innovative approach that enable them gain a competitive edge in the prevailing business environment. Freeman (2016), submits that to choose to be non-innovative is to choose death to an organization. Allocca and Kessler, (2016), emphasised that the firm's innovative performance depends on the opportunities provided by their external environment. This showed that small and medium enterprises become very competitive in an emerging market when they give importance to innovative activities that build their reputation in the market environment.

### **Statement of the problem**

Small and Medium scale enterprises have continued to play positive significant roles in the global economies, especially those of the developing countries like Nigeria. This is very visible in the area of employment creation, improved standard of life, and use of local raw materials among others. Innovation is a tool that has continued to enhance sustainability of SMEs through creation of new products and services that ensures continued customer patronage. The key reason for innovativeness is the desire of firms to obtain increased business performance and increase competitive edge. However, most small and medium enterprises in Nigeria are not innovative and this negatively affects their sustainability. Most manufacturing sectors have not fully integrated innovation to enhance their competitiveness for sustainability.

Despite, the positive significant roles played by the SMEs in the economy sustainability is one of the greatest challenges it faces as most of them go aground soon after they were established. Some of these challenges faced by the small and medium enterprises are relatively slow to adopt sustainability practices due to lack of external stakeholder pressure, weak corporate governance, lack of managerial competence of the owner and managers, lack of training and retraining, lack of research and development, lack of product differentiation, poor customers' satisfaction, lack of succession planning, poor business partnership/alliance and poor organizational structures.

Nigerian's industrial structure continues to display insufficient linkages between the various categories of firms', especially small and medium enterprises where most innovation takes place. Most local firms have not been able to develop technological competences to acquire and apply knowledge from foreign firms. Small and medium enterprises barriers to innovation include lack in capital investment, organizational innovation, education and training systems, encumber regulations and deficiencies in know-how and skills acquisition. Other constraints include managerial capabilities, lack of process innovation, difficulty in utilizing technology innovation which results in low productivity or lack of sustainability.

### **Objectives of the study**

The broad objective of the study is to examine innovation and sustainability of small and medium enterprises in Enugu metropolis, while the following specific objectives were formulated to:

1. Identify product innovation on the circular economy of small and medium enterprises in Enugu metropolis.
2. Ascertain technological innovation on management behavior on small and medium enterprises in Enugu metropolis.

## **Research Questions**

The following research questions were formulated:

1. What is the effect of product innovation on the circular economy of small and medium enterprises in Enugu metropolis?
2. What is effect of technological innovation on the management behaviour of small and medium enterprises in Enugu metropolis?

## **Statement of Hypotheses**

The following statements of hypotheses were formulated to answer the research questions:

1. Product innovation has no significant positive effect on the circular economy of small and medium enterprises in Enugu metropolis.
2. Technological innovation has no significant positive effect on the management behaviour of small and medium enterprises in Enugu metropolis.

## **Review of Related literature**

### **Conceptual Review**

#### **Innovation:**

Schumpeter (1934), posits in his classical interpretation that technical change is “a historic and irreversible change in the method of production of things” and “creative destruction”.

When this definition is analyzed technical change in practice can be implemented in forms related to:

- the implementation of goods (products/services) that are new to consumers, or higher quality

than their previous counterparts;

- the application of process that are new to specific industries and economic activities in which they are used;

- the entering of new markets;

- the use of new sources of raw materials;

- the implementation of new forms of competition that lead to structural changes in the industries of their application.

Organization for Economic Cooperation and Development (OECD), (2005 :46), in the latest revision of her manuals is the Oslo Manual proposed that innovation is

*“the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations”*

OECD, (1981), in her earlier definition describes innovation as: “... all those scientific, technical, commercial and financial steps necessary for the successful development and marketing of new or improved manufactured products, the commercial use of new or improved processes or equipment or the introduction of a new approach to a Social service. R&D is only one of these steps.”

Godin, (2008), presents 12 concepts of innovation which can be described as follows:

**A: innovation as process of doing of something new:**

- innovation as imitation;

- innovation as invention;

- innovation as discovery;

**B: innovation as human abilities to creative activity:**

- innovation as imagination;

- innovation as ingenuity;

- innovation as creativity;

**C: innovation as change in all spheres of life:**

- innovation as cultural change;

- innovation as social change;

- innovation as organizational change;

- innovation as political change;

- innovation as technological change;

**D: innovation as commercialization of new product**

**Sustainability:** Brundtland, (1987), the Brundtland Commission put forth a “global agenda for change” with the purpose of “furthering the common understanding and common spirit of responsibility so clearly needed in a divided world. The report enumerated the following description of sustainable development:

1. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of “needs,” in particular, the essential needs of the world’s poor, to which overriding priority should be given; and ° the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs.
2. Thus the goals of economic and social development must be defined in terms of sustainability in all countries—developed or developing, market-oriented or centrally planned. Interpretations will vary, but they must share certain general features and must flow from a consensus on the basic concept of sustainable development and on a broad strategic framework for achieving it.

3. Development involves a progressive transformation of economy and society. Brundtland (1987).

U.S. Census Bureau. (2007), opines that the hallmark for Business Sustainability firms is to invent, produce and report measurable results in well-defined sustainable development areas, aligning this in an economically sound and profitable way. The value proposition of business is broadened to include all three dimensions of the “triple bottom line” (people, planet, profit).

Bové & Bonini,( 2014); Kron, Kruschwitz, Haanaes, Reeves & Goh, (2013); UN Global Compact & Accenture, (2013 & 2010); Haanaes, Reeves, von Strengvelken, Audretsch, Kron, & Kruschwitz, (2012); Haanaes, Arthur, Balagopal, Teck Kock, Reeves, Velken, Hopkins & Kruschwitz, (2011 ), submitted that the role of business in making our world a more sustainable place is at the center of the study of sustainability management. They asserted that if the studies monitoring the acceptance and integration of sustainability by big companies were followed, there is a strong consensus emerging that sustainability is having and will continue to have a significant material impact on company strategies and operations.

Bakker, 2012; UNEP, 2012; WWF, 2012; Gilding, 2011), assert that poverty has not been eradicated, inequity is growing, hunger and malnutrition still kills a child every 6 seconds, 1.8 billion people don't have access to clean drinking water and sanitation, 2.3 billion people don't have access to electricity and a 4 degree warming scenario is now being accepted by international organizations like the World Bank and the IEA, while the international climate negotiations have failed to produce any consensus on effective global strategies to keep global warming at least below 2 degrees.

**Small and Medium enterprises.**



Enudu, (2019), posits that there is no general acceptable definition of SMEs among scholars, governments, students and economists. That the definition varies from country to country, even within a country different definitions apply to different sectors of the economy, such as in Japan in which manufacturing, commerce and service sectors have different definitions. Enudu, (2019) states that different people employed different criteria such as total asset size, relative size of a firm in an industry, number of employees, sales volume, ownership structure, or a combination of the above features, to define SMEs.

Adenewo,(1988 in Enudu, 2019), submits that SMEs is any organization of production whose main objective is to produce goods, or provide services in order to meet and satisfy human wants in not large or medium scale, on a continuous basis for the primary aim of earning profit as reward for the risk of undertaking the venture

Owualah, (1999), posits that small and medium scale enterprises, are businesses with total investment (including land and working capital not exceeding N5000 and/or whose annual turnover did not exceed N5 million. Owualah opines that since 1993, that the Central Bank of Nigeria (CBN) has redefined them as firms whose total cost excluding cost of land but including working capital is above N1million, but not exceeding N10 million.

Small and Medium scale Enterprises for the purpose of revised Guidelines for the Small and Medium Enterprises Equity Investment Scheme (SMEEIS) is defined as any enterprise with a maximum asset base of N500 million (excluding land and working capital), and with no lower or upper limit of staff (Zenith Economic Quarterly, 2005). This definition is subject to review by CBN from time to time based on inflation.

Small and Medium Scale Enterprises can be characterized as follows:

- ✓ The number of employees is between (11 to 100) workers.
- ✓ Low capital investment and annual business turnover
- ✓ Small in size within the same industry.
- ✓ Management is independent
- ✓ Small and medium scale enterprises are generally labour intensive

James et al., (2018; Pinkovetskaia, Nikitina, & Gromova, 2018), stated that SMEs are business enterprises owned by an individual to create values, which include economic, social, and environmental values and this was corroborated by (Fatoki, 2018), that these values enhance the economic growth of the nation, decrease poverty, and reduce unemployment. Jacinto & Du Miranda & Miranda, (2018), asserted that small and medium enterprises are the pillars of economic development and the empowerment of communities and Bello, Jubril, and Ahmed (2018), mentioned that small and medium enterprises create activities and engagement for institutions such as finance, marketing, and supply chain by way of their business transactions.

### **Product Innovation**

Coad and Rao, (2018), assert that product innovation is the introduction of new product/service. Mile, (2015), posits that product innovation is the introduction of new functions, enhanced performance, or the addition of new features into the existing products. Mile believed that SMEs face unrelenting pressure from powerful customer to lower prices and accept shrinking margins on sales. He submits that companies must offer customer's new products/services to allow for a more efficient and effective use of products that they currently sell.

Demirbs and Hussain, (2017), opine that new product design plays pivotal role in defining the physical form of the product to satisfy customer's needs. The design component entails engineering design such as mechanical, electrical, software and industrial design such as aesthetics, ergo metrics and user interfaces. Fatoki, and Garwe,(2017), submitted that innovation development forms its basis on conducting customer surveys and trying to identify particular customer needs for products which are largely nonexistent. The idea behind product development involves the notion of slowly developing new products when the firm's traditional market is about to become saturated.

### **Technological Innovation:**

Bouhsina (1998), states that technology is a body of knowledge which might be seen as a building block for technological innovation, serving as corner stone to research, design, development, manufacturing and marketing. That technological innovation is a part of the total innovation discipline, which focuses specifically on technology and how to use it successfully in products, services and processes.

Becchetti and Trovato (2015), proposed that technological innovation is a key factor in a firm's competitiveness. That it is unavoidable for firms which want to develop and maintain a competitive advantage and gain entry into new markets.

Harrison and Watson (2017), believed that SMEs are generally more flexible and adapt themselves easily, and are better placed to develop and implement new ideas. Rutan, (2017), submits that technological changes increase profit of organization. That technology is important to support and promote SMEs development as it is responsive to local economies and results in distinctive products and services.

### **Circular economic:**

Circular economic is a new approach to sustainability. Its potential is in part due to its applicability to a wide range of organizations. Circular economy is the opposite of a linear economy, which is characteristic of most contemporary production processes, where natural resources are converted into products, via production, which then turn to wastes. This means natural capital is used, and never restored. Circular economy strategies aim to have no net effect on the environment, restoring damaging resource acquisition, while reducing the waste generated in production (Gast, Gundolf, and Cesinger 2017; Murray, Skene, and Haynes 2017; Geissdoerfer et al. 2017). A key premise of this approach is that overall systems (and strategies) are optimized, rather than individual components. This is achieved via design to re-design thinking, and other novel innovation techniques.

MacArthur, ( 2013), states that circular economy strategies have grown from work by industrial ecologists in the 1990s and that the aim was to create a system with (near) complete internal cycling of materials. The 4R framework of reduce, reuse, remanufacture and recycle is often used as a hierarchy of preferred options for managing materials. Reduce involves increasing efficiency by consuming fewer natural resources and materials during both the production and use phases. Reuse involves ensuring that old products that are still able to function are still used. While remanufacture takes old and often worn-out products and through processing, and ensures that they retain their original function. Lastly, recycling involves further processing of materials to obtain the same or lower quality (Kirchherr et al. 2017). Kirchherr and his group believed that these types of strategies can help to create new industries, new jobs as well as the creation of more sustainable economies.

## **Management Behaviour**

Eccles, Ioannoui & Serafeim, (2014), suggested that primarily defensive policies, codes and guidelines to protect against diverse risks to an integration of triple-bottom line objectives into policies, structures, management compensation and board management to ultimately integrating relevant societal stakeholders into decision-making processes on all levels of the organization are imperative to business sustainability.

Mahajan, and Bose, (2018), opine that top management commitment is, in fact, the most important enabler for formulation and execution of sustainable business strategies. If top bosses of the company do not have a genuine intention to look at sustainability integration, the middle and lower levels of management cannot do much. They can make plans, but those plans must be in line with the overall strategy of the company- which is the domain of top management.

Mahajan and Bose, (2018), believed that business leaders have to be convinced with the business case for sustainability and they must set such a vision for the organization, define goals that are measurable and chalk out guidelines that are precise for lower levels of management to commit to sustainability initiatives.

### **Theoretical framework:**

#### **Upper Echelons Theory**

Hooi et al., (2016) considered upper echelons theory and resource-based view theory, evidence for the research according to Hambrick and Mason (1984) the theory of upper echelons suggested that the managers' situation partly influence the organisation results, strategic decisions as well as level of performance. Surprisingly, senior executive experience, core values, personality traits structure their interpretation of the positions they face, and in turn influence their choices (Hambrick, 2007). Upper echelons theory still remain crucial since upper executives progresses to play major roles in promoting organisational effectiveness (David, et

al., 2012; Hambrick, 2007). Hooi, Ahmad, Amran, and Rahman, ( 2016) concluded that the constructive tendencies intertwined within entrepreneurs are intended to perfect key task through delivering sustainable innovation entrepreneurship. Proposing that as related channel for predicting and explaining why certain enterprises can gain competitive edge and obtain superior profits (Hooi, et al., (2016). Nor-Aishah, Ahmad and Thurasamy, (2020) recognised the contribution of upper echelon theory (UET), believing on Hambrick and Mason (1984) ideologies have argued that, top management homogeneity are testable background qualities like the senior executives age, operational tracks, certain professional experiences, educational status and economic class affects uncountable organisational outcomes which involves firms“ competitive behaviour, diversification level, innovation, strategic business change and efficiency. The upper echelon theory (UET) continue to be valuable and appropriate until today because the enterprise top managerial officials play significant roles in evaluating organisational efficiency (Hambrick, 2007; Bonelli, 2014; Nor-Aishah, Ahmad & Thurasamy, 2020). The upper echelon tasks have a positive effect on organisational sustainability and, as such, contribute to the future sustainable growth of small and medium-sized enterprises (Tacheva, Simpson & Ivanov, 2020).

## **Methodology**

### **Research Design**

The researchers adopted the survey research design for the study and it leaned heavily on opinion of respondents.

### **Area of the Study**

Enugu city is the capital of Enugu state of Nigeria. It is located within the south-east of Nigeria, and was once the capital of eastern Nigeria. Enugu state has boundaries with Ebonyi, Imo, Abia, Anambra, Benue and Kogi state. The state is predominately civil servants, but there are traders and a lot of industrialists and so many SMEs in this state. The study was carried out in selected 35 SMEs spread across Enugu metropolis with a population of 300 including owners and workers.

### **Source of Data**

The sources of data were primary and secondary sources.

### **Primary Sources**

Primary data were first hand information collected by the researcher, usually; the data are assembled by the person who observed the phenomenon. This was achieved through the use of structured questionnaire.

### **Secondary Sources**

Secondary data refers to already published information. Secondary sources of information are those data which contained accounts of events or phenomena by other people who did not participate or witness the events. The secondary data used to conduct this study were sourced from textbooks, journals articles, and online materials.

### **Population of the Study**

This refers to the entire number of the members or elements in which the researcher is interested in. However, the population used in this research work was derived from the population of the

entrepreneurs/CEOs and workers of the SMEs. The entrepreneurs/CEOs and staff of the selected SMEs were the population of this study.

**Table 3.4.1: Population of the Study**

S/NO	SMEs	NUMBER OF EMPLOYEES
1.	Entrepreneurs	35
2.	worker	265
<b>Total</b>		<b>300</b>

Sources: field survey 2022

Thus, the three hundred (300) owners/employees of the above selected SMEs in Enugu metropolis constituted the population of the study.

### **Method of Data Analysis**

The data collected were analysed using tables and simple percentages, while hypotheses were tested using chi-square test statistic.

The chi-square ( $\chi^2$ ) test statistics states as follow:

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where:

$\chi^2$  = chi – square

$\sum$  = summation of all items in items



O = observed frequency

E = expected frequency

### **Degree of Freedom**

$$DF = (R-1) (C-1)$$

Where:

R = Number of Rows

C = Number of Columns

1 = Constant

### **Decision Rule**

Accept  $H_0$ : if the calculated value is less than the critical or table value. Otherwise reject null hypothesis if the calculated value is greater than the critical or table value.

## **Data Presentation, Analysis and Discussion of Findings**

### **Data Presentation**

This section focused on the analytical aspects of the research work. The general report of activities conducted on the primary data collected from the sample population was made for proper presentation and analysis of responses generated from the administered questionnaire.

Here data was presented in Table 4.1 as follows:

**Table 4.1: Distribution and Return of Questionnaire**

No Distributed	% Distributed	No. Returned	% Returned	No. Not returned	% not returned
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300	100	282	94%	18	6
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**Source: Field survey 2021**

Table 4.1, shows a total of three hundred (300) copies of questionnaire distributed to the SMEs. However, two hundred and eighty two (282) copies of questionnaire representing 94% were returned and eighteen (18) copies of questionnaire were not returned. Analyses were therefore, based on the 282 copies of questionnaire that accounts for 94% of the total copies of questionnaire distributed.

**Table 4.1.1: Respondents Response on product innovation on circular economic in SMEs in Enugu metropolis?**

Continuous Product/service improvement of your organization has continued to attract customers' patronage and it does not affect the environment negatively.

<b>Response</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Strongly Agree	162	57.45
Agree	100	35.46
Undecided	20	7.09
Strongly Disagree	-	-
Disagree	-	-
<b>Total</b>	<b>282</b>	<b>100</b>

Source: Field work, 2021

Table 4.1.1 above indicated that the response on the Continuous Product/service improvement of your organization has continued to attract customers' patronage and it does not affect the environment negatively 162(57.45%) strongly agree, 100(35.46%) of the respondents agree, while 18(7.09%) of the respondents were undecided. This implies that those who strongly agree are greater in number.

**Table 4.1.2: Respondents Response on the extent technological innovation affects management behavior of small and medium enterprises in Enugu metropolis.**

Design of new product and service ensure organizational efficiency, especially when it has management support.

<b>Response</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Strongly Agree	170	60.28
Agree	112	39.72
Undecided	-	-
Strongly Disagree	-	-
Disagree	-	-
<b>Total</b>	<b>282</b>	<b>100</b>

Source: Field survey, 2021

Table 4.1.2 shows the extent design of new product and service ensure organizational efficiency, especially when it has management support. The above table shows that 170(60.28%) of the respondents strongly agree, while 112(39.72%) of the respondents agrees. The implication is that those who strongly agree are majority.

### **Testing of Hypotheses**

The hypothesis is tested using the chi-square test statistic

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where:

$\chi^2$  = chi – square

$\Sigma$  = summation of all items in items

O = observed frequency

E = expected frequency

The level of significance is 0.05 or 5%

## Hypothesis I

Ho: Product innovation has no significant positive effect on the circular economy of small and medium enterprises in Enugu metropolis.

**Table 4.1.1: Respondents Response on the** Continuous Product/service improvement of your organization does not attract customers' patronage and the waste does not affect the environment negatively in SMEs in Enugu metropolis.

**Table 4.2.1: Chi-square Contingency Table for Hypothesis I**

Response	O	E	O – E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
Strongly Agree	162	45.2	116.8	13642.24	301.82
Agree	100	45.2	54.8	3003.04	66.44
Undecided	20	45.2	-25.2	635.04	14.05
Strongly Disagree	-	-	-	-	-
Disagree	-	-	-	-	-
<b>Total</b>	<b>282</b>				<b>382.31</b>

Source: Field survey 2021

$$\text{Where: } E = \frac{\text{sum of responses}}{\text{no of catogeries}} = \frac{226}{5} = 45.2$$

To determine the degree of freedom

$$DF = (R-1) (C-1)$$

Where:

R = Number of Rows

C = Number of Columns

1 = Constant

$$DF = (2-1) (5-1)$$

$$(1) (4) = 4$$

$$DF 4 \text{ under } 0.05 = 9.49$$

The table value is given as  $\chi^2 = 9.49$

**Decision:** Thus  $\chi^2$  calculated value (382.31)  $>$   $\chi^2$  tabulated value 9.49. We accept the alternative hypothesis, which states that Product innovation has significant positive effect on the circular economy of small and medium enterprises in Enugu metropolis.

## Hypothesis II

**Table 4.1.2: Respondents Response on the extent** technological innovation affects management behavior of small and medium enterprises in Enugu metropolis.

### Table 4.2.2: Chi-square Contingency Table for Hypothesis II

Design of new product and service ensure organizational efficiency, especially when it has management support of your organization.

Response	O	E	O – E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
Strongly Agree	170	45.2	124.8	15575.04	344.58
Agree	112	45.2	66.8	4462.24	98.72
Undecided	-	-	-	-	-
Strongly Disagree	-	-	-	-	-
Disagree	-	-	-	-	-
<b>Total</b>	<b>282</b>				<b>443.30</b>

Source: Field survey 2021

Ho: Technological innovation does not affect management behavior of small and medium enterprises in Enugu metropolis.

The statistical test is  $\chi^2 = \sum \frac{(O-E)^2}{E}$

$$\text{Where: } E = \frac{\text{sum of responses}}{\text{no of catogeries}} = \frac{226}{5} = 45.2$$

To determine the degree of freedom

$$DF = (R-1) (C-1)$$

Where:

R = Number of Rows

C = Number of Columns

1 = Constant

$$DF = (2-1) (5-1)$$

$$(1) (4) = 4$$

DF 4 under 0.05 = 9.49

The table value is given as  $\chi^2 = 9.49$

**Decision:** Thus  $\chi^2$  calculated value (443.30)  $>$   $\chi^2$  tabulated value 9.49. We accept the alternative hypothesis, which states that technological innovation affects management behavior of small and medium enterprises in Enugu metropolis.

## Summary of Findings, Conclusion and Recommendations

### Summary of Findings

The summary of the findings made for the purpose of this research study include the followings:

- i. Product innovation had significant positive effect on the circular economy of small and medium enterprises in Enugu metropolis, with the statistical evidence ( $\chi^2$  cal. Value 382.31  $>$   $\chi^2$  tab. value 9.49).
- ii. Technological innovation had significant positive effects on management behavior of small and medium enterprises in Enugu metropolis with the statistical evidence ( $\chi^2$  cal. Value, 443.30  $>$   $\chi^2$  tab. value 9.49).

## Conclusion

Product innovation is critical and pivotal to the sustainability of SMEs as it enhances performance and leads to consumers' patronage. It becomes imperative that SMEs should continually have product innovation as to remain relevant in the business environment.

Technological innovation is also pertinent as any business that is not alert to its emergence may go aground as it makes product, service and process obsolete. Therefore, adoption of these innovative ideas is crucial to sustainability of SMEs.

## Recommendations

Based on the findings of the study, the following recommendations were made:

- i) It is recommended that for SMEs to be sustainable it must have product innovation, especially adopting those methods that will not affect the environment negatively.
- ii) That since technological innovation cuts across all segments of innovative ideas it should be at the SMEs core values in other to be sustainable.

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