

# **E**ducational Innovations as a Panacea for Climate Change: Evidence from Federal Capital Territory Abuja – Nigeria.

**<sup>1</sup>AHMED ALIYU TANKO, <sup>2</sup>ADAMU IBRAHIM & <sup>3</sup>JUSTIN SHEKWOYADU ZAKOYI**

<sup>1</sup>Department of Business Administration & Management, Federal Polytechnic, Nasarawa, Nasarawa State – Nigeria. <sup>2</sup>Department of Humanities and Social Sciences, Federal Polytechnic, Nasarawa, Nasarawa State – Nigeria. <sup>3</sup>Department of Public Administration, Federal Polytechnic, Nasarawa, Nasarawa State – Nigeria.

## **ABSTRACT**

**E**ducational innovation is a process of learning new techniques and strategies in a creative way towards improving workable system and government ensure good strategic policies in relation to educational innovations yet climate change continue to rotate across the world which have tremendous effects on economy of a nation. The objective of this study is to investigate the effect of climate change on educational innovations in Federal Capital Territory (FCT) Abuja. The study used survey method and chi square was used to test the formulated hypotheses with a population of 4000 and a sample of 364 respondents were drawn using Taro Yamane's formula. The study concluded that educational innovations significantly impacted on climate change in FCT Abuja. In light of this, the study recommended that government should embark on strict policy formulation towards sustainable development.

**Keywords:** climate change, education, innovation, policy, strategy.

**C**an be creative and innovative towards adding value to the organization and society in general. Climate is the manifestation of weather for a long period in a given area although, it

## **Introduction:**

In recent time, climate change assumes different dimensions and is increasingly becoming an issue of great concern in Federal Capital Territory (FCT) Abuja because significant changes in climate usually takes place in an unprecedented pace. Besides, the relationship between climate change (CC) and educational innovations (EI) is the ability of existing social, economic and educational institutions especially in rural areas where challenges posed by global warming is common. CC has become a topical issue in the globe and received special attention of national and global policy makers due to attendant issues threatening the sustenance of man and his environment. Also, many climates such as safety climate, service climate, human resource development climate, ethical climate, etc. therefore, every organization need to ensure that their employees

differs from one region to another region which result to some region being cold or hot.

EI results to creation of opportunities using different skills with confidence to come up with something good and unique to solve problems in relation to CC in our society. Innovations transforms ideas into products that are used in our societies and it mitigates the challenges of CC. In the same vein innovations is fundamental towards achieving goals in this dynamic environment.

Governments ensure sound strategic policy in response to EI, but CC persist to spin around the globe with significant impacts on a nation's economy. Additionally, it has been crucial in attempting to address the issue of CC because the issue of sustainability is being confronted by safety climate, service climate, and human resource climate. Educational innovation is a process of learning new innovative ideas in a creative way towards enhancing workable systems.

Based on the statement of the problems, the following questions were formulated to guide the study:

- i. What is the effect of safety climate on educational innovations in FCT Abuja?
- ii. What is the effect of service climate on educational innovations in FCT Abuja?
- iii. What is the effect of human resource development climate on educational innovations in FCT Abuja?
- iv. What is the effect of regional climate on educational innovations in FCT Abuja?

The objective of this study is to investigate the effect of climate change on educational innovations in Federal Capital Territory (FCT) Abuja. The specific objectives of the study are:

- i. Examine the effect of safety climate on educational innovations in FCT Abuja.
- ii. Investigate the effect of service climate on educational innovations in FCT Abuja.
- iii. Assess the effect of human resource development climate on educational innovations in FCT Abuja.
- iv. Examine the effect of regional climate on educational innovations in FCT Abuja.

The following assumptions have been made based on the research questions and objectives:

**H<sub>01</sub>:** Safety climate does not have effect on educational innovations in FCT Abuja.

**H<sub>02</sub>:** Service climate does not have effect on educational innovations in FCT Abuja.

**H<sub>03</sub>:** Human resource development climate does not have effect on educational innovations in FCT Abuja.

**H<sub>04</sub>:** Regional climate does not have effect on educational innovations in FCT Abuja.

The significance of this study in today's competitive environment where educational innovations has become a subject of fundamental importance and prerequisite to national development and concern to all nations. EI lessens social inequality, supports local technology, and fosters innovation and creativity with sound policy that raises quality of life.

### Literature Review

Human activity is causing climate change, which includes global warming and an increased danger of flooding. Numerous interrelated factors, such as latitude, elevation, adjacent water, ocean currents, topography, vegetation, etc., affect a location's climate. Local climate is also influenced by the global climate system and any changes that take place within it. Climate is changing in an unprecedented pace but the urgency for tackling climate change can be easily looked.

The following model was used to create the framework, which illustrates the interaction between independent and dependent variables:

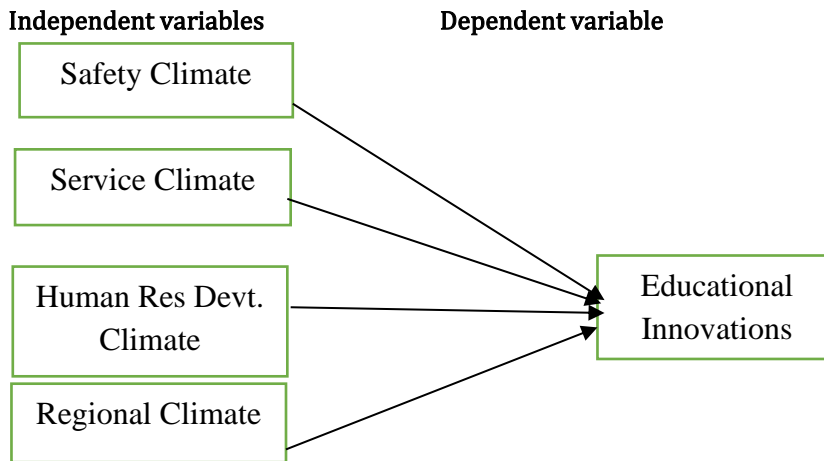


Figure 1: Conceptual framework

Different practises and experiences have led to the creation of many theories and beliefs. The Resource-Based View (RBV) Theory, Kirzner's Theory, and Economic Survival Theory are a few related theories that serve as the theoretical foundation for this subject.

The RBV theory holds that it is easier to exploit new opportunities using available resources and the performance of an entrepreneur is to an extent tied to its internal resources as opposed to its happenings in the external environment. That is, instead of focusing and examining the opportunities as well the threats in the external environment as the major determinants of the entrepreneur's performance, it should also consider its strengths and weaknesses (Barney, 1995). These strengths and weaknesses of the entrepreneur include the ability to be proactive, take initiative, persevere, persuasive, amongst other internal resources. This theory stipulates that the need for achievement is one of the major drivers for the entrepreneur's superior performance. Due to the nature of CC and business potential, the RBV theory was chosen as the theoretical foundation for this study.

Kirzner's theory focuses on entrepreneurial alertness and Kirzner believes that this alertness is a trait that successful entrepreneurs are interested. Kirzner (1997) asserts that entrepreneurship is based on what he called spontaneous learning, alertness and entrepreneurial discovery. The alertness allows entrepreneurs to identify opportunities during the climate change while, entrepreneurial discovery increase mutual awareness among entrepreneurs. Kirzner has constantly and vehemently contended that careful observation is necessary for a true interpretation of how capitalist economists function.

Economic survival theory holds that a holistic approach to an unpleasant situation in the life of entrepreneurs that adopt entrepreneurship as a means of survival. Also, it centers on the premise that entrepreneurs should adapt to the competitive environment for their survival.

Empirical studies on climate change are very few within the context of educational innovations to enrich the existing literature however, Koskei et al. (2021) steered a research on effect of psychological climate on employee performance in government ministries in Kenya with the aim to examine the effect of psychological climate on employee performance. Explanatory research

design was used. The results demonstrated that the psychological environment has a favourable impact on job performance. The study did not take into account the environment of Kenyan government departments, which is one significant flaw found in the current study.

In order to evaluate the obstacles to the growth of entrepreneurship in Nigeria with a focus on Borno State, Achie et al. (2020) conducted study on entrepreneurship education in Nigeria. The results were validated using ANOVA at a 5% level of significance. Since the multiple comparisons revealed a level of significance of.000 in each of the three senatorial districts as opposed to the 5% level of significance, the results indicated that there is a meaningful correlation between the entrepreneurship issues in the three senatorial districts. The research's failure to consider environmental factors in senatorial districts and the technique used to obtain the data were key flaws, according to the current analysis, which also found that Borno State was improperly utilised to represent the entire nation. Therefore, generalising these findings would not be appropriate or justified.

Similar to this, Onu (2019) conducted study on the influence of microfinance practises on the growth of women entrepreneurs in Ebonyi State, Nigeria, with the purpose of examining the impact of these practises using regression analysis to describe the relationship between the variables. The study found that the development of women entrepreneurs in the state is significantly impacted by microfinance loan services. The methodology utilised to gather the sample was not justified, and the study failed to include organisational policies in other areas; as a result, generalising these findings would not be sufficient or justified, which was one of the study's key flaws as noted by the current study.

Additionally, Akinbami et al. (2019) conducted an empirical study on examining potential climate-related business possibilities and difficulties for rural Nigerian women with the purpose of examining how women in south-western Nigeria perceive the effects of climate change. In the study, it was found that women are highly conscious of climatic variations. It was found that more than 90% of women thought the adjustments to their livelihood activities had a substantial impact. The current investigation found that the methodology utilised in the study had a number of significant flaws.

In order to ascertain the impact of entrepreneurship education implementation in tertiary institutions on wealth creation and job creation, Zakka et al. (2018) studied the implementation of entrepreneurship education in tertiary universities. The study found that schools produce graduates devoid of practical knowledge and skills who are also estranged from their own surroundings. It was determined that the importance of entrepreneurship education for generating wealth and jobs cannot be overstated. The administration of higher education facilities in Nigeria was urged to make significant investments in the education and reeducation of entrepreneurship instructors. The current investigation found that the methodology utilised in the study had a number of significant flaws. As a result, it might be challenging to generalise these results.

In order to identify the universities that have a propensity to foster an entrepreneurial culture, Akuegwu & Nwi-ue (2016) conducted an empirical study on the development of entrepreneurial culture among university students in South-South, Nigeria. 340 people were chosen at random using the stratified random procedure after the data were statistically examined using descriptive statistics. According to the survey, Benin University has the highest propensity to foster an entrepreneurial culture. It was suggested that universities should make more of an effort to foster

an entrepreneurial culture. The new study found that the environmental elements utilised to compare the four federal universities' propensity for entrepreneurship culture were an important flaw in the previous study.

### Methodology

Survey method was adopted to investigate the educational innovations as a panacea for climate change in FCT Abuja. The statistical methods employed for the analysis of the data obtained enabled the adopted designs explain the link between the adopted indices of the study variables. The Yamane's (1967) simplified formulae was used to obtain the sample as:

$$n = N/1 + Ne^2 \dots\dots\dots (1)$$

Where: "*n* = computed sample, *N* = population, *e* = sampling error while, 0.05 level of significance is the decision of researchers".

$$\text{Thus, } n = \frac{4000}{1 + 4000(0.05)^2} \quad n = \frac{4000}{1 + 4000(0.0025)} \quad n = \frac{4000}{1 + 10} \quad n = \frac{4000}{11} \quad n = 363.6363$$

$n \approx 364$  respondents

The hypotheses were tested using the chi-square test method. The following are the chi-square formulas:

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

Where: "*X<sup>2</sup>* = Chi-square, *O* = Observed Frequency, *E* = Expected Frequency, and  $\sum$  = Summation".

### Results and Discussion

This section includes a presentation of the data, its analysis, and a discussion of the results. In order to determine the relationship between the various selected characteristics of EI and CC in FCT Abuja, distributed copies of the questionnaire were prepared in accordance with the objectives.

**Table 1 Return Rate of Respondents**

<i>Responses</i>	<i>Questionnaire Administered</i>	<i>Questionnaire Not Returned</i>	<i>Questionnaire Returned</i>	<i>Percentage of Total Questionnaire Returned</i>
<b>Maitama</b>	94	7	87	26.4
<b>Garki</b>	96	8	88	26.7
<b>Area 1</b>	92	9	83	25.1
<b>Wuse</b>	82	10	72	21.8
<b>Total</b>	364	34	330	100

*Source: Field Survey, 2022*

Table 1 shows the response rate on the numbers of questionnaires distributed to respondents in FCT Abuja for this study. It reveals that 94 questionnaires were administered to Maitama, 96 questionnaires were administered to Garki, 92 questionnaires were administered to Area 1 while, 82 questionnaires were administered to Wuse. In addition, 25.1% of the total questionnaires received were from Area 1 while 21.8% of the total questionnaires received were from Wuse, Garki, Maitama, and 26.7%, 26.7%, and 25.1%, respectively, of the total questionnaires received. This table also reveals that 330 questionnaires, or 91%, of the total 364 that were distributed, were received, and that is adequate for the study to move on.

Table 2: Demographic Characteristics of Respondents

Variables	Respondents'	Freq.	Percentages
	Category		
Gender	Male	137	40.1
	Female	205	59.1
	<b>Total</b>	<b>342</b>	<b>100</b>
Age	Below 30 years	195	57
	31-40 years	76	22.2
	41-50 years	40	11.7
	51 years and above	31	9.1
	<b>Total</b>	<b>342</b>	<b>100</b>
Experience	Below 10 years	201	58.8
in Climate	11 - 20 years	93	27.2
Change	Above 21 years	48	14
	<b>Total</b>	<b>342</b>	<b>100</b>

Source: *Field Survey, 2022*

The demographic details of the study's participants were shown in Table 2. According to the table, there are 205 participants, or 59.1% of the total, who are female and 137 participants, or 40.1% of the total, who are male. This indicates that there are more female participants than male. Further revelation by the table showed that the age of 195 respondents are below 30 years representing 57% of the total respondents, 76 respondents representing 22.2% are within the range of 31 - 40 years while, 40 respondents representing 11.7% are within the range of 41 - 50 years and 31 respondents representing 9.1% are above 51 years, this implies that the ages of respondents is within the average. Besides, experience of respondents in climate change showed that 201 or 58.8% are below 10 years, 93 respondents representing 27.2% are 11 - 20 years, 48 respondents representing 14% are above 21 years.

**Hypothesis one:***H<sub>01</sub>: Safety climate does not have effect on educational innovations in FCT Abuja.*

Table 3 Observed Frequency

Options	SA	A	U	D	SD	Row Total
Male	55	20	14	33	15	137
Female	65	32	21	40	47	205
Column Total	120	52	35	73	62	342

Source: Field Survey, 2022

Table 4 Expected Frequency

Options	SA	A	U	D	SD
Male	40	28	20	29	20
Female	55	40	30	45	35

Source: Field Survey, 2022

Table 5 Contingency Table

<i>O</i>	<i>E</i>	<i>O - E</i>	$(O - E)^2$	$\Sigma(O - E)^2 / E$
55	40	15	225	5.63
65	55	10	100	1.82
20	28	-8	64	2.29
32	40	-8	64	1.60
14	20	-6	36	1.80
21	30	-9	81	2.70
33	29	4	16	0.55
40	45	-5	25	0.56
15	20	-5	25	1.25
47	35	12	144	4.11

*Source: Field Survey, 2022*

Calculated  $X^2 = 22.31$

Tabulated  $X^2$ :

Level of significance = 0.05

Degree of Freedom = (Number of Row - 1) (Number of Column - 1)

Degree of Freedom = (2 - 1) (5 - 1)

Degree of Freedom = 1 x 4 = 4

Tabulated  $X^2 = 9.48$

According to the decision rule, the null hypothesis should be accepted unless the calculated chi square (22.31) exceeds the critical chi square value (9.48). We reject the null hypothesis and come to the conclusion that the safety climate has an impact on EI in the FCT of Abuja since the computed value is higher than the critical value.

**Hypothesis two:**

*H<sub>02</sub>: Service climate does not have effect on educational innovations in FCT Abuja.*

Table 6 Observed Frequency

<i>Options</i>	<i>SA</i>	<i>A</i>	<i>U</i>	<i>D</i>	<i>SD</i>	<i>Row Total</i>
Male	45	20	31	19	22	137
Female	48	50	49	25	33	205
Column Total	93	70	80	44	55	342

*Source: Field Survey, 2022*

Table 7 Expected Frequency

<i>Options</i>	<i>SA</i>	<i>A</i>	<i>U</i>	<i>D</i>	<i>SD</i>
Male	35	26	17	23	36
Female	41	38	42	40	44

*Source: Field Survey, 2022*

Table 8 Contingency Table

<i>O</i>	<i>E</i>	<i>O - E</i>	$(O - E)^2$	$\Sigma(O - E)^2 / E$
45	35	10	100	2.86



48	41	7	49	1.20
20	26	-6	36	1.38
50	38	12	144	3.79
31	17	14	196	11.53
49	42	7	49	1.17
19	23	-4	16	0.70
25	40	-15	225	5.63
22	36	-14	196	5.44
33	44	-11	121	2.75

*Source: Field Survey, 2022*

Calculated  $X^2 = 36.45$

Tabulated  $X^2$ :

Level of significance = 0.05

Degree of Freedom = (Number of Row - 1) (Number of Column - 1)

Degree of Freedom = (2 - 1) (5 - 1)

Degree of Freedom = 1 x 4 = 4

Tabulated  $X^2 = 9.48$

According to the decision rule, the null hypothesis should be accepted unless the calculated chi square (36.45) exceeds the critical chi square value (9.48). We reject the null hypothesis and come to the conclusion that service climate has an impact on educational innovations in FCT Abuja since the computed value is higher than the critical value.

### *Hypothesis three:*

*H<sub>03</sub>: Human resource development climate does not have effect on educational innovations in FCT Abuja.*

**Table 9 Observed Frequency**

<i>Options</i>	<i>SA</i>	<i>A</i>	<i>U</i>	<i>D</i>	<i>SD</i>	<i>Row Total</i>
Male	33	21	19	27	37	137
Female	50	34	38	40	43	205
Column Total	83	55	57	67	80	342

*Source: Field Survey, 2022*

**Table 10 Expected Frequency**

<i>Options</i>	<i>SA</i>	<i>A</i>	<i>U</i>	<i>D</i>	<i>SD</i>
Male	23	15	33	30	46
Female	47	30	33	46	49

*Source: Field Survey, 2022*

**Table 11 Contingency Table**

<i>O</i>	<i>E</i>	<i>O - E</i>	<i>(O - E)<sup>2</sup></i>	<i>Σ(O - E)<sup>2</sup> / E</i>
33	23	10	100	4.35
50	47	3	9	0.19
21	15	6	36	2.40
34	30	4	16	0.53



19	33	-14	196	5.94
38	33	5	25	0.76
27	30	-3	9	0.30
40	46	-6	36	0.78
37	46	-9	81	1.76
43	49	-6	36	0.73

Source: Field Survey, 2022

Calculated  $X^2 = 17.74$

Tabulated  $X^2$ :

Level of significance = 0.05

Degree of Freedom = (Number of Row - 1) (Number of Column - 1)

Degree of Freedom = (2 - 1) (5 - 1)

Degree of Freedom = 1 x 4 = 4

Tabulated  $X^2 = 9.48$

The decision rule states that when calculated  $x^2$  is less than table  $x^2$ ,  $H_0$  will be accepted. On the contrary, when calculated  $x^2$  is greater than table  $x^2$ ,  $H_0$  will be rejected. Since the computed value (17.74) is greater than the critical value (9.48), we reject the null hypothesis and conclude that human resource development climate have effect on educational innovations in FCT Abuja.

#### Hypothesis four:

*H<sub>0</sub>: Regional climate does not have effect on educational innovations in FCT Abuja.*

Table 12 Observed Frequency

Options	SA	A	U	D	SD	Row Total
Male	41	14	32	25	25	137
Female	32	41	45	50	37	205
Column Total	73	55	77	75	62	342

Source: Field Survey, 2022

Table 13 Expected Frequency

Options	SA	A	U	D	SD
Male	32	30	35	27	23
Female	51	38	28	50	38

Source: Field Survey, 2022

Table 14 Contingency Table

O	E	O - E	(O - E) <sup>2</sup>	$\sum(O - E)^2 / E$
41	32	9	81	2.53
32	51	-19	361	7.08
14	30	-16	256	8.53
41	38	3	9	0.24
32	35	-3	9	0.26
45	28	17	289	10.32
25	27	-2	4	0.15
50	50	0	0	0
25	23	2	4	0.17

37	38	-1	1	0.03
----	----	----	---	------

Source: Field Survey, 2022

Calculated  $X^2 = 29.31$

Tabulated  $X^2$ :

Level of significance = 0.05

Degree of Freedom = (Number of Row - 1) (Number of Column - 1)

Degree of Freedom = (2 - 1) (5 - 1)

Degree of Freedom = 1 x 4 = 4

Tabulated  $X^2 = 9.48$

The decision rule states that when calculated  $x^2$  is less than table  $x^2$ ,  $H_0$  will be accepted. On the contrary, when calculated  $x^2$  is greater than table  $x^2$ ,  $H_0$  will be rejected. Since the computed value (29.31) is greater than the tabulated value (9.48), we reject the null hypothesis and conclude that regional climate have effect on educational innovations in FCT Abuja.

### Conclusion and Recommendations

Safety climate, service climate, human resource development climate and regional climate are strongly related to educational innovations with statistical significance. The findings showed that safety climate, service climate, human resource development climate and regional climate affect educational innovations.

Recommendations were made based on the findings and conclusion:

- (i) Strategy on the awareness campaign to educate the public on safety climate should be modified.
- (ii) Seminars and workshops should be organized for every stakeholder on survival strategy to improve service climate.
- (iii) Government should embark on strict policy formulation towards sustainable innovations and managing human resource development climate.
- (iv) The selected areas should ensure that services of qualified and professional personnel to look in to the problems affecting regional climate.

### References

- Achie, S. T., Shittima, Y. A., & Yusuf, D. T. (2020). Entrepreneurship development: Prospects and challenges. *Journal of Management Sciences*, 1(1), 490-498.
- Akinbami, C. A. O., Olawoye, J. E., Adesina, F. A. & Nelson, V. (2019). Exploring potential climate-related entrepreneurship opportunities and challenges for rural Nigerian Women. *Journal of Global Entrepreneurship Research*, 9(19), 1-28.
- Akuegwu, B. A. & Nwi-ue, F. D. (2016). Developing entrepreneurship culture among University students in South-South, Nigeria. *Mediterranean Journal of Social Sciences*, 7(2), 315-324.
- Koskei, C. S., Richard, O. M. & Mbaraka, R. (2021). Effect of psychological climate on employee performance in government ministries, Kenya. *Journal of Economics, Management Sciences and Procurement*, 1(1), 1-18.
- Onu, A. N. (2019). Effect of microfinance services on the growth of Women entrepreneurs in Ebonyi State, Nigeria. *Bingham Journal of Economics and Allied Studies*, 3(1), 147-158.
- Oliver, T., Alain, F., Luke, P. & Diamanto, P. (2017). Role and impact of the environment on entrepreneurial learning. *Entrepreneurship and Regional Development Journal*, 29(9-10), 869-888.
- Zakka, D. D., Bewaran, Y. S., Yongsun, S. & Moris, P. W. (2018). Effective implementation of entrepreneurship education in tertiary institutions for wealth creation and employment generation. *The Tin City Business Journal*, 2(1), 33-41.