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ABSTRACT

The zeal for diversification and sustainable development is made possible through technological discoveries, innovation and commercialization; this can be achieved through application of Technological Entrepreneurship. This paper examined Technological Entrepreneurship as a catalyst for job creation and Sustainable Development in Nigeria, using School of Engineering Technology, Federal Polytechnic, Bida as a study area. The researchers adopted a structured questionnaire using Five (5) Point Likert Scale Rating System to collect data from Staff of School of Engineering Technology. The population of staff in school of engineering technology one hundred and eighty five (185). Eighty (80) questionnaires were distributed using a Random Sampling Technique. The total of seventy (71) questionnaires were returned. The Null hypothesis was stated as there is no significant relationship between technological entrepreneurship and sustainable development. The analysis of data was done using Analysis Of Variance (ANOVA) as obtained in Statistical Product and Service Solution (SPSS). In line with the research finding, the Analysis of Variance (ANOVA), shows that the P-Value as analyzed is 0.001 which is less than 0.05, this therefore shows that there is significant relationship between Technological Entrepreneurship, and sustainable development. The reliability statistics which is **Cronbatch Alpha (a)** was used, this test shows that the items on the instrument are 73%

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reliable, which complements the significance relationship as revealed by ANOVA. The paper concluded that whenever there is a breakthrough in research and development, it is the place of entrepreneurship commercialize to technological achievements of technological efforts otherwise; it remains in the making laboratory without any impact. Technological Entrepreneurship is a vital element in Economic Diversification and Sustainable Economic Development. Recommendations were given which include the need for collaboration between school of engineering, research and publication Entrepreneurship Centre in order to adopt, commercialized and sustain new research findings.

Keywords: Economic Diversification, Sustainable Development, Technological Entrepreneurship, Innovation, Job Creation

INTRODUCTION

The zeal for diversification of Nigeria economy is made possible discoveries, technological innovation commercialization. In other words it has been observed that while entrepreneurship which is the exploitation of business opportunity would bring about job creation and wealth generation, it has limitation in bringing about accelerated industrial development that would enable a country to compete in the frontiers of global rapid technological developments, Willie, Abiodun, Egbetokun, Maruf, (2011). A perusal and study into the economic activities and happenings in Nigeria, it is the view of the researcher that the current dependency on oil by Nigeria government is not only capable of causing continued imbalance in her economic activities but may result into becoming a backward economy amongst the comity of developing economy in Africa and beyond.

Therefore technological entrepreneurship is cardinal and must be exploited to meet up with globalization and sustainable development agenda in Nigeria. Technological entrepreneurship can be seen as strategy that can bridge the gap between technology, innovation and economic development. Technological entrepreneurship, in particular, is a strong driving force for sociogrowth the global economy. Technological economic in entrepreneurship is a vital ingredient in any effective National or Regional Innovation System. A recent research on the status of Technological entrepreneurial Attitude in Nigerian Tertiary Institutions revealed that majority of undergraduates in Nigeria indicated a preference for technological entrepreneurship but much fewer of them has actually practiced entrepreneurship, NACETEM, (2008).

These researchers are trying to communicate to audience and readers about the application of technological entrepreneurship in school of Engineering Technology in Federal Polytechnic, Bida, and technological entrepreneurship as a catalyst to sustainable development. Research efforts and findings has not exceed the laboratory, while enough has been spent on funding research work in our tertiary institutions, less has been seen of application of the outcome of these research efforts. There exist gap between research innovation in technology and commercialization or marketing of the invented technology. The paper focuses on the conceptual approach, Economic Diversification, Technological Entrepreneurship, Its relevance, Sustainable Development and the future of Technological Entrepreneurship on Economic Diversification, Data Analysis, Conclusion and Recommendations.

STATEMENT OF RESEARCH PROBLEM

The current dependency on oil by Nigeria government is not only capable of causing continued imbalance in her economic activities but may result into becoming a backward economy amongst the comity of developing economy in Africa and beyond. The output in engineering technology has not really been seen in the market place hence it makes it difficult to understand how research and inventions are utilized by the Federal Polytechnic, Bida and the community in general.

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RESEARCH HYPOTHESIS

Ho: There is no significant relationship between technological entrepreneurship and sustainable development

H1: There is significant relationship between technological entrepreneurship and sustainable development

RESEARCH OBJECTIVES

This was designed to:

- 1. Examine the application of technological innovations in School of Engineering Technology, Federal Polytechnic, Bida
- 2. To know whether Technological innovations in School of Engineering Technology has been adopted in student training
- 3. To find out if the technological innovations in School of Engineering Technology has been commercialized to enhance sustainable development.
- 4. To examine the significance of technological entrepreneurship and also to see whether technological entrepreneurship increases the chances for sustainable development

METHODOLOGY

The reliability of any empirical research is based on the validity of data and its method of collection. The researcher adopted a structured questionnaire to collect data from staff of School of Engineering Technology, Federal Polytechnic, Bida, this was done through Five Point's Likert Scale Rating Method. A total of eighty (80) questionnaires were administered of which seventy one (71), F-distribution (ANOVA) in Statistical Product and service Solution (SPSS) was used for data analysis.

LITERATURE REVIEW/CONCEPTUAL FRAMEWORK Economic Diversification

Economic diversification has the propensity to meet the basic requirement for sustainable development like meeting the poor's basic needs which revolves around provision of job, food, health, clothing and shelter by opening diverse avenues of economic activity which accommodates broad spectrum of people. It also propels technological discovery, the expansion of environmental ability to meet people's needs by improving the technology, social organization, diversity of areas of economic activity and not over exploiting one aspect of natural resources to the point of extinction and environmental degradation. Again, it creates a broad based economy that has the ability to secure equity both within and between generations. Michael and Anthony, (2015).

According to Yemi, (2016), the revision of the National Account statistics shows that Nigeria's economic structure has changed since 1990 being less dependent on agriculture and more on services. Agriculture used to be about 35% of GDP but is now 22%. Industry which included crude oil and gas production used to be 9 36% of GDP but is now 25% while services that used to be 39% of GDP is now over 50%. This however reveals disconnect in development theory. Countries are meant to transform from agriculture to industry then services, and each stage of this transition usually takes some time. However, we seemed to take an alternate path from the agricultural stage and, without really developing the industrial base, gone straight to services, and now we are going back to industry and manufacturing in particular. The growing demand for services under normal development theory should have been fulfilled by manufacturing which should have grown alongside the services.

But due to constraints to manufacturing, services was supported by imports. So we want TVs and furniture or cars and, rather than support our local industry to produce to meet this demand, instead we import. Hotels provide accommodation services but most of the furniture in the hotel are imported. So it provides the service to Nigerians, increasing our services GDP but not manufacturing. Our telecoms sector provides one of the biggest telecommunication services in the world but manufacturing of telecommunication equipment that drives that service is relatively non-existent. So we use phones to enjoy telecoms services but the phones and iPads are not produced here. As such, our large

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consumption of services supports manufacturing in other countries. The crux of this is that there must be change from consumption dependent economy to productive dependent economy which largely consists of industrial technology based activities where our local resources and raw material can be harnessed.

Technological Entrepreneurship

Technological entrepreneurship can be defined as the process of discovering technological opportunity and its application towards economic development through commercialization in a most efficient and effective manner in order to achieve economic development, this definition is offered by the researcher of this paper. In the work of Dorf and Byers (2007). Technological entrepreneurship is defined as a style of business leadership that involves identifying high-potential, technology intensive commercial opportunities, gathering resources such as talent and capital, and managing rapid growth and significant risk using principled decision making and skills

RELEVANCE OF TECHNOLOGICAL ENTREPRENEURSHIP

- Technological entrepreneurship is a key source of economic and social progress. It refers to the creation of new firms by independent entrepreneurs and corporations to exploit technological discoveries in order to help achieve sustainable development. These new firms create jobs, contribute to the wellbeing of their communities and generate wealth for their owners.
- 2. Technological entrepreneurship is needed to propel technological innovation efforts into the market. Whenever there is a breakthrough in research and development. It is the place of technological entrepreneurship to commercialize the achievements of technological efforts otherwise, it remains in the laboratory without making any impact. One of the reasons why many research breakthroughs never leave the laboratory is due to short fall of technological

entrepreneurs.

- 3. Technological entrepreneurship has the potential of improving state of technological capability in a country. This is because as technological efforts are being made, learning takes place. This occurs either by doing or observation, thus improving technological capability in the efforts in question.
- 4. Because technological entrepreneurship would necessarily involve the commercialization of a research output, more patents are generated and patents are a well-known indicator and measure of technological development and industrialization in countries all over the world.
- 5. Technological entrepreneurship the platform that successful accelerates the diffusion of technological innovation in an economy. For instance in Nigeria, and in most African countries, the rate of diffusion of Information Communication Technology (ICT) is on the increase. This is made possible by the private firms that saw an opportunity and decided to market ICT products and services thereby increasing the pace of diffusion.
- 6. For a technological entrepreneur to be relevant, he must of necessity meet market needs and be a problem solver. In a bid to meet market need, research and development as well as science and technology efforts must be well coordinated to bring about socio-economic development.

SUSTAINABLE DEVELOPMENT

According to the classical definition given by the United Nations World Commission on Environment and Development (UN, 2010), development is sustainable if it "meets the needs of the present without compromising the ability of future generations to meet needs." usually understood that It is their "intergenerational" equity would be impossible to achieve in the absence of present-day social equity, if the economic activities of some groups of people continue to jeopardize the well-being of people belonging to other groups or living in other parts of the world. Sustainable development could probably be otherwise called "equitable and balanced," meaning that, in order for development to continue indefinitely, it should balance the

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interests of different groups of people, within the same generation and among generations, and do so simultaneously in three major interrelated areas, economic, social, and environmental. Sustainable development is about equity, defined as equality of opportunities for well-being of people as well as about comprehensiveness of objectives Aina (2006). In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development; and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations

THE FUTURE OF TECHNOLOGICAL ENTREPRENEURSHIP ON ECONOMIC Diversification

In the developing countries such as Nigeria, high level of entrepreneurship important reducing the is in adverse socioeconomic impacts by creating new employments. A society with a strong entrepreneurial culture have a positive influence on the rate at which new firms are created and their chances of survival and growth as well as the fate of al-ready existing firms Arzeni (1998). In a more specific sense, entrepreneurship is the vehicle on which innovation, which is the application of knowledge in production, rides. Indeed, innovation is at the heart of Within this context, entrepreneurs entrepreneurship. considered as champions of some sort who convert ideas into products and services and ultimately create wealth and reduce unemployment Othman et-al, (2006).

DATA ANALYSIS

The analysis of data was done using Analysis of variance (ANOVA); this was supported by regression and reliability statistics taking into consideration the hypothesis raised.

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FREQUENCY DISTRIBUTIONTABLE TABLE 1:SEX DISTRIBUTION OF RESPONDENTS

		Frequency	Percent		Cumulative Percent
Valid	MALE	65	91.5	91.5	91.5
	FEMALE	6	8.5	8.5	100.0
	Total	71	100.0	100.0	

TABLE 2: AGE DISTRIBUTION

		Frequency			Cumulative Percent
Valid	31-40	38	53.5	53.5	53.5
	41- Above	33	46.5	46.5	100.0
	Total	71	100.0	100.0	

TABLE 3: QUALIFICATION OF RESPONDENTS

				Valid	Cumulative
		Frequency	Percent	Percent	Percent
Valid	Degree/HND	43	60.6	60.6	60.6
	Master's Degree	25	35.2	35.2	95.8
	Ph.D	3	4.2	4.2	100.0
	Total	71	100.0	100.0	

TABLE 4: YEAR OF SERVICE OF RESPONDENTS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5	37	52.1	52.1	52.1
	6-10	10	14.1	14.1	66.2
	11-20	10	14.1	14.1	80.3
	21- Above	14	19.7	19.7	100.0
	Total	71	100.0	100.0	

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TABLE 5: THE POLYTECHNIC HAS ADOPTED THE TECHNOLOGICAL INVENTIONS FROM SCHOOL OF ENGINEERING TECHNOLOGY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	10	14.1	14.1	14.1
	D	4	5.6	5.6	19.7
	U	11	15.5	15.5	35.2
	Α	24	33.8	33.8	69.0
	SA	22	31.0	31.0	100.0
	Total	71	100.0	100.0	

TABLE 6: THE POLYTECHNIC COMMUNITY IS AWARE OF TECHNOLOGICAL INVENTIONS IN SCHOOL OF ENGINEERING TECHNOLOGY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	8	11.3	11.3	11.3
	D	3	4.2	4.2	15.5
	U	3	4.2	4.2	19.7
	Α	38	53.5	53.5	73.2
	SA	19	26.8	26.8	100.0
	Total	71	100.0	100.0	

TABLE 7: TECHNOLOGICAL DISCOVERY AND RESEARCH OUTPUT FROM SCHOOL OF ENGINEERING TECHNOLOGY HAS BEEN COMMERCIALIZED TO ACHIEVE SUSTAINABLE DEVELOPMENT

				Valid	Cumulative
		Frequency	Percent	Percent	Percent
Valid	SD	14	19.7	19.7	19.7
	D	19	26.8	26.8	46.5
	U	17	23.9	23.9	70.4
	Α	19	26.8	26.8	97.2
	SA	2	2.8	2.8	100.0
	Total	71	100.0	100.0	

TABLE 8: MOST TECHNOLOGICAL INVENTIONS IN THE SCHOOL OF ENGINEERING TECHNOLOGY HAS BEEN ADOPTED FOR STUDENTS TRAINING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	9	12.7	12.7	12.7
	D	6	8.5	8.5	21.1
Total	U	7	9.9	9.9	31.0
71	Α	22	31.0	31.0	62.0
100.0	SA	27	38.0	38.0	100.0

TABLE 9: THE GOVERNMENT IS AWARE OF TECHNOLOGICAL INVENTIONS IN THE SCHOOL ENGINEERING TECHNOLOGY

		Frequency	Percent		Cumulative Percent
Valid	SD	8	11.3	11.3	11.3
	D	4	5.6	5.6	16.9
	U	18	25.4	25.4	42.3
	Α	22	31.0	31.0	73.2
	SA	19	26.8	26.8	100.0
	Total	71	100.0	100.0	

TABLE 10: RESEARCHERS AND INVENTORS OF TECHNOLOGY IN SCHOOL OF ENGINEERING ARE MARKETING THEIR INVENTIONS

		_		Valid	Cumulative
		Frequency	Percent	Percent	Percent
Valid	SD	6	8.5	8.5	8.5
	D	9	12.7	12.7	21.1
	U	22	31.0	31.0	52.1
	Α	26	36.6	36.6	88.7
	SA	8	11.3	11.3	100.0
	Total	71	100.0	100.0	

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TABLE 11: TECHNOLOGICAL ENTREPRENEURSHIP CAN MAKE INDUSTRIALIZATION MORE EFFECTIVE

		Frequency	Percent		Cumulative Percent
Valid	J	1	1.4	1.4	1.4
	Α	22	31.0	31.0	32.4
	SA	48	67.6	67.6	100.0
	Total	71	100.0	100.0	

TABLE 12: TECHNOLOGICAL ENTREPRENEURSHIP WILL BOOST ECONOMIC ACTIVITIES THEREBY ENHACING SUSTAINABLE DEVELOPMENT

		Frequency	Percent		Cumulative Percent
Valid	Α	21	29.6	29.6	29.6
	SA	50	70.4	70.4	100.0
	Total	71	100.0	100.0	

TABLE 13: TECHNOLOGICAL ENTREPRENEURSHIP CAN CREATE JOB OPPORTUNITY

		Frequen cy	Perce nt	Valid Percent	Cumulative Percent
Vali	Α	13	18.3	18.3	18.3
d	SA	58	81.7	81.7	100.0
	Tot al	71	100.0	100.0	

TABLE 14: THE STAFF IN SCHOOL OF ENGINEERING TECHNOLOGY DOES NOT HAVE THE RESOURCES TO CARRY OUT A QUALITY RESEARCH ON TECHNOLOGICAL INVENTION TO ACHIEVE SUSTAINABLE DEVELOPMENT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	2	2.8	2.8	2.8
	D	21	29.6	29.6	32.4
	U	3	4.2	4.2	36.6
	Α	21	29.6	29.6	66.2
	SA	24	33.8	33.8	100.0
	Total	71	100.0	100.0	

TABLE 15: THE POLYTECHNIC IS ENCOURAGING AND MOTIVATING STAFF ON TECHNOLOGICAL INVENTIONS

				Valid	Cumulative
		Frequency	Percent	Percent	Percent
Valid	SD	7	9.9	9.9	9.9
	D	2	2.8	2.8	12.7
	U	7	9.9	9.9	22.5
	Α	48	67.6	67.6	90.1
	SA	7	9.9	9.9	100.0
	Total	71	100.0	100.0	

TABLE 16: TECHNOLOGICAL INNOVATION INCREASES
THE CHANCES OF SUSTAINABLE
DEVELOPMENT

					Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Α	20	28.2	28.2	28.2
	SA	51	71.8	71.8	100.0
	Total	71	100.0	100.0	

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TABLE 17: TECHNOLOGICAL ENTREPRENEURSHIP CAN LEAD TO JOB CREATION IN THE POLYTECHNIC COMMUNITY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	1	1.4	1.4	1.4
	Α	22	31.0	31.0	32.4
SA 48 67.6	Total				
		71	100.0	100.0	
67.6					
100.0					

ANOVA TABLE

		Sum of				
Mo	odel	Squares	Df	Mean Square	F	Sig.
1	Regression	65.999	1	65.999	11.312	.001 ^b
	Residual	402.593	69	5.835		
	Total	468.592	70			

a. Dependent Variable: SUSTAINABLE DEVELOPMENT

COEFFICIENTS TABLE

	COLITICIENTO TABLE					
Model		Unstandardized Coefficients		Standardized Coefficients		
			Std.			
		В	Error	Beta	Т	Sig.
1	(Constant)	22.048	1.250		17.637	.000
	TECHNO	.162	.048	.375	3.363	.001

a. Dependent Variable: SUSTAINABLE DEVELOPMENT

RELIABILITY STATISTICS TABLE

Cronbach's Alpha	N of Items
.725	17

b. Predictors: (Constant), TECHNOLOGICAL ENTREPRENEURSHIP

DISCUSSION AND RESULT

The analysis on frequency table five (5) shows that technological inventions has not been adopted. This findings is in relation to the objective which is aimed knowing whether the technological inventions in the school of engineering technology has been adopted by the Polytechnic. Technological discoveries and research outputs has not been commercialized to help achieve sustainable development. This was opposed by analysis on frequency table seven (7) which opposes the objective of the research which was aimed at knowing whether commercialization of research out and inventions. The researchers in school of engineering technology does not have the resources to carry out quality research to achieve sustainable development. Technological entrepreneurship increases the chances for sustainable development. This views were the views of most respondents and in line with the research objective.

Using F-Distribution Test (ANOVA), shows that the P-Value which is **0.001** is less than **0.05**, therefore we reject the Null hypothesis and accept the Alternative hypothesis which state that significant relationship between Technological Entrepreneurship and sustainable development. In order to ascertain the level of relationship between technological entrepreneurship and sustainable. The result of regression also shows a high significance at **0.001** which is same result with that of F-distribution i.e (ANOVA). In testing the reliability of the items on the instrument, Cronbatch Alpha (a) was used. Thus, the test shows that the items on the instrument are 73% reliable. In reference to the work of Nnamaeka as cited in Mohammed and James (2008), revealed that given Nigeria's desire for accelerated economic development, the inadequacy of our indigenous scientific and technological base, and the strength of international effect, the country is liable to import technology hence suffers dependency in term of production ability and competition in global market, which will affect the level of sustainable development.

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CONCLUSION

It can be concluded based on this research that, unless the output of research and development efforts reaches the market or commercialized, industrialization would he elusive. Technological entrepreneurship will set pace for other discipline to follow and also serve as a means of self-reliance to the all or productive members of the society. Technological entrepreneurship will enhance the teaching of engineering in the polytechnic; this is capable of generating or creating employment and jobs.

RECOMMENDATIONS

Based on the responses from respondents, the following are the major recommendations for implementation.

- There should be collaboration between school of engineering, research and publication committee and entrepreneurship Centre in order to adopt, commercialized and sustain new research findings.
- 2. Government should assist polytechnic staff financially in order to boost their morale in facilitating the technological entrepreneurship especially in the polytechnic environment.
- 3. The polytechnic and government should provide adequate financial and material resources to encourage local entrepreneurs in field of technology.
- 4. The research work by staff of engineering technology should not stop until it gets to relevant authorities for implementation.

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