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Strategies for Improving Industrial Technology Education Programmes in Universities in South East Nigeria for Job Creation

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Abstract

This study focused on identifying strategies for improving ITE programmes in Universities in South East Nigeria for job creation. Two specific objectives guided the study. Two research questions were raised and two hypotheses were tested in the study. The study adopted a descriptive survey design. The population for the study was 527 comprising 86 lecturers and 441 students in the universities offering ITE programmes in South East, Nigeria. Proportionate stratified random sampling technique was used to select a sample size of 265 respondents comprising of 42 lecturers and 233 students. A 24 item structured questionnaire was used to generate data for the study. Three experts validated the instrument. A reliability coefficient of .93 was obtained using Cronbach Alpha formula. Mean was used to answer the research questions while t-test was used to test the null hypotheses at .05 level of significance. The study found out that all the 24 items were agreed upon by the respondents as various strategies for improving ITE programmes in Universities. The study found out that there was no significant difference between the mean responses of lecturers and students on the instructional and funding strategies for improving ITE programmes in Universities in South East Nigeria. The study recommended among others that the Federal Government should demonstrate sincere political will and utmost commitment towards the development of ITE programmes through significant increase in her annual budgetary allocation to the education sector as well as adopt an effective framework for policy making, implementation, monitoring and evaluation so as to achieve the objectives of the programme and ensure job creation; ITE instructors should employ the use of modern instructional strategies like augmented reality, virtual reality, scaffolding, Artificial Intelligence, collaborative/cooperative learning, online learning, as effective strategies to effectively impart in the students as well as to improve ITE programmes for job creation.

Keywords: Industrial Technology Education, Strategies, Universities, South-East Nigeria.

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INTRODUCTION

Over the years, many nations of the world have strived towards the overall development of their countries. This with no doubt has been done with education as a key factor. However, Nigeria as a developing nation has faced numerous challenges towards attaining national development (Okobia, 2024). Some of these challenges are; high unemployment rate especially among youths, insecurity, poverty, inflation, economic meltdown, political instability, religious and ethnic crises among others (Oghuvbu & Chidozie, 2018). Nevertheless, some of these challenges could be curbed and significant national development achieved if jobs are created by the government or individuals for the ever rising Nigerian population. Job creation could be attained when there is an effective education system targeted towards the production of adequate manpower that possess the requisite skills, values and attitudes to be employable and also be self-employed.

Job creation could be defined as a process of establishing new jobs for unemployed people. It could also be a way by which an individual provides himself or others with jobs or a

process of making more jobs available to reduce unemployment. Okuwa (2020) noted that over 200 million people are unemployed all over the world with youths faring poorly because enough jobs are not being created to absorb new entrants into the workforce. Ayeni et al. (2021) defined job creation as a process of making jobs available for the unemployed, either by helping them create jobs for themselves or providing them paid jobs where they can earn a living. They further explained that job creation means providing new jobs for the unemployed and the underemployed without necessarily displacing people who are already employed in other economic activities. Hence, job creation could also be referred to as the supply of employment opportunities for people who are eager and capable of working. From the foregoing, job creation entails providing new jobs for jobless people without creating further unemployment.

Job creation seems to be among the toughest challenges facing Nigeria today. Critically looking at Nigeria's socio-economic status, it could be observed that the task of creating jobs to battle unemployment and underemployment especially among youths has indeed been a challenging one (Abdulrazaq & Lambe, 2024). The reasons for this may be attributed to the lack of realistic and effective strategies in addition to the lack of political will by government authorities towards enhancing a robust and effective Technical Vocational Education And Training (TVET) system to enhance the production of competent graduates who could become self-employed and also job creators thereby reducing unemployment and contributing to the country's Gross Domestic Product (GDP).

Technical Vocational Education and Training (TVET) is that training given to individuals to impart in them necessary skills, values, attitudes and knowledge to enable them become self-reliant. This implies that through TVET, skills are acquired by the individuals that make them self-employed and even create jobs for others. The United Nations Scientific and Cultural Organisation (UNESCO) (2016), defined TVET as a term that involves education, training and the development of skills in a variety of occupational domains. The Federal Republic of Nigeria (FRN) (2013), describes TVET as an all-inclusive term dealing with those aspects of the educational process involving in addition to general education, the study of related sciences and the acquisition of practical skills and values related to occupations in various sectors of economic and social life. Furthermore, Okolocha as cited in Ntegwung (2022) views TVET as an academic training which involves skills, competencies, knowledge and experiences for securing jobs in various sectors of the economy and even equipping one to be self-dependent and also being a job creator.

Summarily, TVET is a broad or multifaceted academic programme aimed at producing skilled and competent graduates to meet industrial needs, enhance job creation and thereby promote national development (Jamaludin et al., 2023). Major occupational areas under TVET are; Industrial Technology Education, Agricultural Science Education, Home Economics Education, Business Education, Computer Science Education and Fine Arts Education among others. For the purpose of specificity, this study shall focus on Industrial Technology Education (ITE) as a component of TVET.

Industrial Technology Education (ITE) which is also known by various institutions as "Industrial Technical Education", "Industrial Education", "Technical Education", and "Technology Education" is a very significant component of TVET as a formal and organised field of study. It is among the TVET programmes offered in various Nigerian tertiary institutions like universities, polytechnics and colleges of education. It is that part of education involving the acquisition of practical skills in various technological areas as well as basic scientific knowledge, attitude and values (Ochogba & Isiodu 2024). According to Udoudo and Udoetuk (2020), ITE is concerned with that body of knowledge well-structured in a planned

sequence of classroom and workshop experiences usually at the post-secondary level to prepare students for a group of career opportunities in a specific technological field.

Ogbondah and Kemkanma as cited in Gaya (2022) noted that ITE programmes prepare students to understand the principles of science and technology as applied to modern design and engineering. Definitely, the main aim of ITE programmes is to inculcate requisite skills in the students so as to equip them to fight unemployment and poverty as they become self-reliant while contributing to national development. Onyebuchi and Wogor (2019) posited that any country that intends making significant progress and attaining national development must embrace a system of education that has applicability to real life. They further explained that ITE programmes deal with the grooming of technocrats and technicians for the main purposes of implementing development of the country and inculcating in our youths the basic knowledge of essential technologies. Okorieocha and Duru as cited in Ukomm and Agha (2015) opined that the acquisition of ITE skills is essential to attaining industrial development for it is a type of education geared towards the application of basic principles of science and technology for industrial design. Furthermore, Usman et al. (2021) posited that ITE programmes lead to the acquisition of practical skills that produce competent graduates to handle and effectively manage the complexities of present day technological inventions.

Industrial Technology Education programme is offered in some universities in South East Nigeria. Universities are part of the tertiary institutions in the country and are very significant in the country's overall socio-economic and technological development. Akpan as cited in Udoudo and Udoetuk (2020) posited that universities in Nigeria are expected to contribute to national development by expanding its programmes for the creation of high manpower needs for the country's diverse economic sectors. In addition, it is important to mention that the curriculum for the ITE programmes in the universities is systematically organised in such a way that in the first two years of study, the students are exposed to general studies, core science and mathematics courses, foundational education courses and general technology courses. In their third year, they are made to specialize in any areas of their interest. These areas of specialization include; Automobile Technology, Building Technology, Electrical/Electronic Technology, Metalwork Technology, and Woodwork Technology. In addition, the students also undergo supervised Students Industrial Works Experience Scheme (SIWES) and teaching practice. This is to enable them have hands-on practical experience in the industries to get necessary experience in the real world job setting and also to equip them with the necessary pedagogical skills to enable them perform satisfactorily as professional teachers in their areas of specialisation.

A strategy is an overall plan to achieve one or more goals. According to Juneja (2023), strategy is a well-defined roadmap, blueprint or action taken by an organisation towards attaining its set goals. Horwath (2020) sees strategy as the intelligent allocation of resources through a unique system of activities to accomplish a goal. In the context of this study, a strategy is a well-planned set of actions aimed at achieving well defined goals. Various strategies exist which could be applied in improving ITE programmes in universities in South East Nigeria to enhance job creation. Some of these strategies include; instructional strategies, funding strategies and motivational strategies among others.

Several researchers have identified various strategies for improving various TVET occupational areas for job creation. However, no studies have identified strategies for improving ITE in universities in South East Nigeria for job creation. Considering the numerous challenges faced by the country especially as regards job creation, unemployment, the high demand for technology teachers in various institutions and high demand of skilled ITE graduates to promote industrial, technological and overall national development of Nigeria,

there is a critical need to examine specific strategies for improving ITE programmes offered in universities in South East Nigeria for job creation and national development. It is based on this background that this study becomes imperative.

Statement of the Problem

Industrial Technology Education (ITE) programme is expected to provide the necessary skills for the agricultural, industrial, commercial and economic development of the country in addition to producing competent graduates and skilled personnel who are to be enterprising and self-reliant (FRN, 2013). This implies that it is specifically directed towards contributing significantly towards job creation through the production of skilled manpower that will be productive in the industries and also self-employed.

However, ITE programme in Nigeria has not been adopted as an ideal tool for job creation. This is evident as the government has not demonstrated sincere political will and utmost commitment towards the improvement of TVET. Thus, Ojimba as cited in Gaya (2022) noted that the neglect of ITE programmes has a negative impact as it robs the nation of the contributions the graduates would make on national development.

Despite the importance of ITE programmes in respect to job creation in the country, unemployment is still a major problem and has led to further challenges which include insecurity, stealing, armed robbery, kidnapping, fraud, prostitution especially among youths thereby affecting the economic development of the country. This is consistent with the common saying that an idle mind is the devil's workshop as it is indeed evident that one cannot give what he or she does not have. Hence, there is need to improve ITE programmes in the universities for enhanced job creation.

Purpose of the Study

The general purpose of this study is to describe strategies for improving ITE programmes in universities in South East Nigeria for job creation. Specifically, the study sought to:

1. determine instructional strategies for improving ITE programmes in universities in South East Nigeria for job creation;
2. ascertain funding strategies for improving ITE programmes in universities in South East Nigeria for job creation.

Research Questions

The following research questions were raised for the study:

1. What are the instructional strategies for improving ITE programmes in universities in South East Nigeria for job creation?
2. What are the funding strategies for improving ITE programmes in universities in South East Nigeria for job creation?

Hypotheses

The study was guided by the following hypotheses which were tested at 0.05 level of significance.

Ho_1: There is no significant difference between the mean responses of lecturers and students on the instructional strategies for improving ITE programmes in universities in South East Nigeria for job creation.

H_{O2}: There is no significant difference between the mean responses of lecturers and students on the funding strategies for improving ITE programmes in universities in South East Nigeria for job creation.

METHODOLOGY

Descriptive survey research design was adopted for the study. According to Asenahabi (2019), descriptive survey design is a systematic process of collecting data from a sample or entire population or group so as to determine the opinions or status of that group as per that time with respect to one or two variables. The author further explained that descriptive survey design provides a numeric description of attitudes, opinions or trends of a population by studying a sample of that population.

The study was carried out in the five universities offering ITE programmes in the South East geopolitical zone. They are: University of Nigeria, Nsukka (UNN), Nnamdi Azikiwe University, Awka (NAU), Michael Okpara University of Agriculture, Umudike (MOUAU), Alex Ekwueme Federal University, Ndufu-Alike Ikwo (AE-FUNAI), Enugu State University of Science and Technology (ESUT) and Ebonyi State University (EBSU).

The population of the study was 527 comprising 86 lecturers and 441 students in the universities offering ITE in South East, Nigeria.

The sample for the study was 265 comprising 42 lecturers and 223 students. The respondents were selected by using proportionate stratified random sampling technique because the population sample was divided into schools. The sample size of 265 respondents stood at 50% of the entire population of 527. This sample size was used because it represented the highest variability that can be expected in the population (Mora, 2019; Radu, 2025). This was done by collecting 50% of both lecturers and students from each of the schools. Stratified sampling ensures unbiased representation and inclusion of all the students. According to Simkus (2023), stratified random sampling is a sample selection technique in which the researcher divides a population into smaller subgroups known as strata based on the members' shared characteristics and then randomly chooses from each stratum to generate the final sample. Thus, the population was divided into smaller groups (strata) from each of the Universities selected for the study.

A 24 item structured questionnaire titled "ITE programmes Improving Job Creation Strategies Questionnaire" (ITEPIJCSQ), was used for data collection. The instrument developed by the researcher from literature review has two sections; sections A which elicited personal information of the respondentd and section B which contained the 24 items on the three strategies for improving ITE programmes in universities. The instrument was structured by the researcher on a five-point scale of Strongly Agree (SA) - 5, Agree (A) – 4, Undecided (U) - 3, Disagree (D) -2, and Strongly Disagree (SD) – 1**.**

The instrument was face validated by three experts, two from ITE Department and one from Measurement and Evaluation Unit in the Department of Science Education, Michael Okpara University of Agriculture, Umudike Abia state for clarity and suitability of all the items in providing reliable data for answering the research questions. Their suggestions were integrated into the modified copy of the instrument that was used for data collection.

The reliability of the instrument was estimated through trial-testing by administering the questionnaire to ten ITE lecturers and ten ITE students in the university of Uyo, Akwa Ibom State in South South who have the same characteristics with the study population. The

responses were recorded, scored and subjected to Cronbach Alpha reliability test. A reliability of .93 was obtained for the instrument.

The researcher administered the questionnaire to the respondents online through Google forms and with the help of four research assistants. The responses were retrieved online by the researcher as Google Forms enabled an automatic recording of the responses. The respondents were requested to complete the questionnaire online as soon as possible and notify the researcher immediately they respond. The researcher recorded ninety-five percent (95%) response rate within the interval of one week.

Descriptive and inferential statistics were used in data analyses. Specifically, the data collected was analyzed using mean, standard deviation and t-test. The mean was used to answer the research questions while the t-test was used to test the null hypothesis at 0.05 level of significance. The decision rule for the research questions was a cutoff point of 3.50. The hypotheses were accepted when the computed value of t (t-calculated) at $p<0.05$ level of significance at an obtained degree of freedom is less than the t-table value, otherwise it is rejected. The data computation was done with the application of a computer software programme; statistical program for social sciences (SPSS).

RESULTS

Research Question 1

What are the instructional strategies for improving ITE programmes in universities in South East Nigeria for job creation?

Table 1: Mean Responses of Lecturers and Students on the Instructional Strategies for Improving ITE Programmes in Universities in South East Nigeria for job Creation.

S/No	Item Statements	Lecturers N_1=42		Students N_2 = 223		Decision
		$\bar{x}_1$	SD_1	$\bar{x}_2$	SD_2	
1	Online Learning/Instruction (Google Classrooms, Zoom, Telegram, Whatsapp).	4.404	1.083	4.551	.681	Agree
2	Use of Artificial Intelligence (AI) in teaching and learning e.g. ChatGPT, AI Chatbots.	3.571	1.150	4.089	.995	Agree
3	Virtual Reality in teaching.	4.166	1.124	4.538	.675	Agree
4	Game based instruction/gamification in teaching difficult concepts.	3.785	.976	4.296	.760	Agree
5	Flipped Classrooms will improve the programs by encouraging student participation at their own pace.	4.381	1.010	4.390	.802	Agree
6	Use of Simulation in teaching.	4.119	.942	4.000	.000	Agree
7	Application of Robotics in teaching.	4.214	1.137	4.000	.885	Agree
8	Use of Scaffolding in teaching.	4.190	.833	4.000	.885	Agree
9	Use of Augmented Reality in teaching.	4.261	.912	4.000	.885	Agree
10	Expeditionary Learning.	4.190	.862	4.000	.885	Agree
11	Promote Individual/Independent learning.	4.428	.830	4.000	.885	Agree
12	Encourage Collaborative/Cooperative learning.	4.452	.739	4.000	.885	Agree
13.	Application of Differentiated Instruction.	4.476	.943	4.000	.885	Agree
	Grand Mean/Standard Deviation	**4.203**	**0.965**	**4.143**	**0.778**	**Agree**

The analysis of the data in table 1 was used to answer research question one. From the table, the rated mean scores ranged from 3.571 to 4.476. All the 13 items had the mean ratings of lecturers and students above the cut-off point 3.50. This also reflected in the grand means of 4.203 and 4.143 respectively. This indicates that all the items were accepted by the respondents as instructional strategies for improving ITE programmes in Universities for job creation.

Research Question 2

What are the funding strategies for improving ITE programmes in universities in South East Nigeria for job creation?

Table 2: Mean Responses of Lecturers and Students on the Funding Strategies for Improving ITE Programmes in Universities in South East Nigeria for job Creation.

S/No	Item Statements	Lecturers N_1=42		Students N_2 = 223		Decision
		$\bar{x}_1$	SD_1	$\bar{x}_2$	SD_2	
14.	Financial Support from International Organisations such as World Bank, United Nations Educational, Scientific and Cultural Organization (UNESCO), through grants, scholarships, etc.	4.905	.297	4.866	.391	Agree
15.	Donations/Endowment Funds from private individuals and employers of labour.	4.381	.539	4.372	.562	Agree
16.	Budgetary Allocations/Subventions from the Federal Government.	4.857	.354	4.825	.415	Agree
17.	Tuition Fees and School Charges.	4.191	.773	4.184	.758	Agree
18.	Internally Generated Revenue (IGR) from ICT, Medicals, Bookshops and other University Facilities.	4.762	.431	4.727	.476	Agree
19.	Funding from Corporate Organisations (Commercial Banks, NNPC, Construction companies, etc.).	4.381	.539	4.359	.526	Agree
20.	Financial Support from Tertiary Education Trust Fund (TETFUND).	4.762	.431	4.695	.542	Agree
21.	Undertaking Research for organisations and individuals.	4.405	.544	4.359	.598	Agree
22.	Undertaking Contracts for organisations and individuals.	4.643	.656	4.583	.711	Agree
23.	Undertaking Consultancy services for organisations and individuals.	4.429	.590	4.381	.639	Agree
24.	Financial support from Non-Governmental Organisations (NGOs), Alumni Associations, Professional bodies, etc.	4.714	.508	4.650	.596	Agree
	Grand Mean/Standard Deviation	**4.585**	**0.515**	**4.546**	**0.565**	**Agree**

The analysis of the data in table 2 was used to answer research question two. From the table, the rated mean scores ranged from 4.191 to 4.905. All the 11 items have the mean ratings of lecturers and students above the cut-off point 3.50. This also reflected in the grand means of 4.585 and 4.546 respectively. This indicates that all the items were accepted by the respondents as funding strategies for improving ITE programmes in Universities for job creation.

Hypothesis 1

Ho_1: There is no significant difference between the mean responses of lecturers and students on the instructional strategies for improving ITE programmes in universities in South East Nigeria for job creation.

Table 3: Summary of t-Test Analysis of Mean Responses of Lecturers and Students on the Instructional Strategies for Improving ITE Programmes in Universities in South East Nigeria for Job Creation.

Groups	No	Mean	Standard Deviation	Level of Sig.	Df	p-value	Decision
Lecturers	42	4.203	0.965	0.05	263	0.38	Accepted
Students	223	4.143	0.778				

The t-test analysis presented in Table 4 shows a p- value of 0.38 at 263 degree of freedom. This indicates that that the p-value is greater than .05 level of significance. Consequently, the null hypothesis is accepted. This signifies that there is no significant difference between the mean responses of lecturers and students on the instructional strategies for improving ITE programmes in universities in South East Nigeria for job creation.

Hypothesis 2

Ho_2: There is no significant difference between the mean responses of lecturers and students on the funding strategies for improving ITE programmes in universities in South East Nigeria for job creation.

Table 4: Summary of t-test Analysis of Mean Responses of Lecturers and Students on the Funding Strategies for Improving ITE Programmes in Universities in South East Nigeria for job Creation.

Groups	No	Mean	Standard Deviation	Level of Sig.	Df	p-value	Decision
Lecturers	42	4.203	0.965	0.05	263	0.46	Accepted
Students	223	4.143	0.778				

The t-test analysis presented in Table 5 shows a p- value of 0.46 at 263 degree of freedom. This indicates that that the p-value is greater than .05 level of significance. Consequently, the null hypothesis is accepted. This signifies that there is no significant difference between the mean responses of lecturers and students on the funding strategies for improving ITE programmes in universities in South East Nigeria for job creation.

Discussion of Findings

The findings from table one reveal that all the 13 instructional strategies for improving ITE programmes in Universities in South East Nigeria for job creation received mean ratings above the cut-off point of 3.50 on the five point Likert scale. It further showed that the application of differentiated instruction, collaborative/cooperative learning, individual/independent learning, online learning and flipped classrooms, augmented reality, scaffolding among others are effective strategies for improving ITE programmes in Universities in South East Nigeria for job creation. Supporting this finding was Persaud (2023), Baker (2023), and Bailon (2023), who posited that effective instructional strategies assist students to become actively involved in the learning process. Thus, when these strategies are applied correctly, they tend to support students in reaching their learning objectives.

The findings from table two showed that all the 11 funding strategies for improving ITE programmes in Universities in South East Nigeria for job creation received mean ratings above the cut-off point of 3.50 on the five point Likert scale. It further showed that financial support from International Organisations such as World Bank and UNESCO through grants, scholarships, etc., significant budgetary allocations from the Federal government, TETFUND, Internally Generated Revenue from the Universities and financial support from NGOs among others are efficient strategies for improving ITE programmes in Universities in South East Nigeria for job creation. This finding is in line with the assertion of Aniobi and Ewuim (2021), Ezeonwurie (2019) and (Omotoyinbo, 2019), who clearly noted that funding is a very crucial ingredient in the development of academic programmes. Funding is indeed the most important strategy that could be used in developing ITE programs in universities. This is because all other strategies are hinged on funding. Staff salaries and allowances, infrastructure, instructional

materials, and other inputs are all dependent on it. Thus, it is important that all stakeholders support ITE programmes especially through funding to enable its overal improvement.

Tables 3 and 4 revealed that there is no significant difference between the mean responses of lecturers and students on the instructional and funding strategies for improving ITE programmes in universities in South East Nigeria for job creation.

CONCLUSION

Industrial Technology Education is a programme that equips individuals with practical schools that enables them become self-reliant and also job creators. For the programme to achieve its aims and objectives, there is urgent need for government, private sector, university administrators, lecturers, technical staff and other key stakeholders to sincerely put together efforts and resources to improve ITE programmes in Universities in South East Nigeria. ITE students can only acquire the relevant skills for the world of work under competent instructors. The adoption of modern instructional strategies and provision of adequate funding by government and other stakeholders will lead to an overall improvement of ITE programmes. This will in turn improve the quality of graduates that will be produced whose skills will match with the skills needed in the industries, encourage creativity, innovation, entrepreneurship, dignity of labour as well as job creation for the overall development of the country.

RECOMMENDATIONS

1. Because funding is a crucial ingredient for the success of every organisation, the Federal Government of Nigeria should demonstrate sincere political will and utmost commitment towards the development of ITE programmes through significant increase in her annual budgetary allocation to the education sector as well as adopt an effective framework for policy making, implementation, monitoring and evaluation so as to achieve the objectives of the programme and ensure job creation. Other stakeholders such as industries, international organisations should support ITE programmes especially through funding, provision of modern facilities and professional development of ITE personnel.
2. University administrators should make use of various administrative strategies such as effective planning, budgeting, quality control, supervision, monitoring and evaluation among others as administrative strategies for improving ITE programmes in Universities in South East Nigeria for job creation.
3. ITE instructors should embrace and employ the use of modern instructional strategies like the application of differentiated instruction, collaborative/cooperative learning, individual/independent learning, online learning, flipped classrooms, augmented reality, virtual reality, scaffolding, use of Artificial Intelligence and robotics among others as effective strategies to effectively impart in the students as well as improving ITE programmes for job creation.

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