

## Entrepreneurship Skills Acquisition in Science and Technology Education Curriculum for Self-Reliance

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### Abstract

This paper attempts to look at the future of vocational and technical education considering social implication and skills acquisition for self-employment and sustainability. It focused on entrepreneurship education and skills acquisition as the solution to unemployment problem in Nigeria. The concept of entrepreneurship education and skills acquisition and its roles in making an individual self-reliant were treated in line with the managerial abilities necessary for self-reliance. This paper also examined the senior secondary school curriculum, benefits of entrepreneurship education, problems and prospects of entrepreneurship and skills acquisition in Nigeria, strategies for promoting entrepreneurship education and skills acquisition; lastly, recommendations and conclusion were made.

### Introduction

Skills and knowledge is power house of economic growth and social development. By investing in human resources enterprises, individual are able to sustain themselves, improve productivity compete more successfully in increasing integrated world economics leading to better standard of living. Science as a vast intellectual adventure which engages the world's most creative minds was introduced into Nigeria as part of the missionary educational package. Dienye and Gbamanja (2000) called this type of science introduced in Nigeria primary schools by Missionaries Nature Study and Hygiene. Later this nature study curriculum was changed. According to Abi (2011) rural science syllabus was formulated for the primary schools while biology related subjects like botany, physiology and agriculture were introduced into the secondary school curriculum. Dienye and Gbamaaja (1990), Abi (2011) and Omiko (2011) observed that several world events related to science and technology has affected the teaching and learning of science not just in Nigeria or Africa as a whole but throughout the world. Such world events include:

- (a) The lesson of the Second World War;
- (b) Gaining of independence by many countries of the world.
- (c) Abolition of slave trade.
- (d) Space travel and movement to the moon and
- (e) The introduction of computer and information communication technology (ICT).
- (f) The recent global economic meltdown

In Nigeria, Science Education Curriculum has undergone several changes; this is done with the aim of meeting the industrial, scientific and technological needs of the country. Omiko (2011) observed that there is a consensus among science educators that secondary school science education curriculum lacks a sense of direction as well as a theory and philosophy which would provide guidance for entrepreneurship and skills acquisition at the secondary school level. Ibe and Igwe (2010) opined that any nation whose citizens are knowledgeable and skilled enough to influence positively the industrial, educational, agricultural and all the important sectors of the economy is to be classified as a developed nation. Our country Nigeria has undergone several economic adjustment programs. We need people who can be self-employed and who can reduce the unemployment rate. Global economic meltdown, its resultant effect on our economy and various measures taken by governments (states and federal) had resulted into many economic predicaments, such as unemployment, low enrolment in schools, high inflation, debt-

burden and a failing standard of living. The problem of unemployment resulting from the economic meltdown calls for reorganization and restructuring of the science and technology education curriculum to elude those curriculum elements that would enable the recipients (learners) to acquire requisite self-employable skills at the end of their training. Education is a human right instrument upon which foundation of freedom, democracy, good governance and sustainable human and national development hinges. Education affects how well individuals, communities and countries fare. It also aims at elimination of ignorance, poverty, disease and the provision of the requisite knowledge for the empowerment needed for full actualization of human potentials (Ainabor, 2010).

The integration of science and technology education curriculum with entrepreneurial education, Information Communication Technology (ICT) skills, and civic or citizenship education would help to reduce unemployment. Entrepreneurial education and ICT skill have been acknowledged world wide as a potent and viable tools for self-employment, job and wealth creation (Lukman and Oviawe, 2010). The introduction of civic education is meant to foster responsible citizenship for sustainable human development. Therefore, if the vision 20-20-20 goal aspiration of Nigeria and the Millennium Development Goals (MDGs) are to be achieved, we need to modify the science and technology curriculum in line with the global trend in science education.

### Concept of Entrepreneurship

Entrepreneurship as a concept is as old as man but began to gain national and international interest over the past decades as one of the most potent economic forces the world has ever experienced. Obierika and Nwachokor (2011), opined that the growing importance of entrepreneurship is demonstrated in the diversity of its definitions as it attempts to explain what entrepreneurship is all about. The concept of entrepreneurship is very broad and connotes different things to different disciplines. For the purpose of this paper, it is necessary to state the following definitions:

- To a psychologist, an entrepreneur is a person typically driven by some forces to obtain or attain something through experiment, accomplish or perhaps escape the authority of others (Ibe and Igwe, 2010).
- To an economist, entrepreneur is one who brings resources of labour, materials and other assets into combinations that make their value greater than before and also introduces changes, innovations and a new order.
- To businessman, an entrepreneur appears as a threat, an aggressive competitor. Obi (2009) sees an entrepreneur as a person who brings about a change and possesses characteristics to implement ideas to benefit the society as a whole. It is the person who wants to be self-employed. It is a process of creating and running one's own business. Obierika and Nwachokor (2011) defined entrepreneurship as creating and building something of value from practically nothing, creation and distribution of something of value and of benefits to individuals, groups, organizations and society.
- To educationists, entrepreneurship is an ability of an individual to acquire skills that enable him/her to be self-reliant, Osuala (2004), sees entrepreneurship education as a specialized training given to students to acquire skills, ideas and management abilities necessary for self-reliance. He outlined the major objectives of entrepreneurship education to include:
  - To provide meaningful education for the youths, which could make them self-reliant and subsequently encourage them to derive profit and self-independence?
  - To provide small and medium sized companies with the opportunity to recruit qualified graduates who will - receive training and tutoring in the skills relevant to the management of the small business Centre.

- To provide graduates with the training and support necessary to help them establish a career in small and medium sized business.
- To provide graduates with training in skills that will make them meet the manpower needs of the society, .
- To provide graduates with enough training in risk management to make uncertainty bearing possible and easy.
- To provide graduates with enough training that will make them. creative and innovative in identifying new business opportunities.
- To stimulate industrial and economic growth of rural and less developed areas.

The integration of entrepreneurship education in the science and technology education curriculum of the secondary schools and tertiary institutions with relevant skills acute business knowledge, self-confidence and national development is necessary.

### **The Senior Secondary School Curriculum and Entrepreneurship Skills Acquisition**

According to the National Policy on Education (FRN, 2004), Science Education shall emphasize the teaching and learning of science process and principles. This will lead to fundamental and applied research in the sciences at all levels of education. The broad aim of Science Education includes:

- Cultivate inquiring, knowing and rational mind for the conduct of a good life and democracy.
- Produce scientists for national development;
- Service studies in technology and the cause of technological development; and
- Provide knowledge and understanding of the complexity of the physical world, the forms and the conduct of life.

The National Policy on Education (FRN, 2004) stated that the senior secondary school shall be comprehensive with a core-curriculum designed to broaden pupils' knowledge and outlook.

### **The Structure of the New Core-Curriculum for the 3-Year Senior Secondary Education in Nigeria ~**

Group A: Core Subjects: Compulsory, cross cutting core subjects:

- English language
- Mathematics
- A major Nigerian language
- One of Biology, Chemistry, Physics or Health Science
- One of Literature-in-English, History, Geography or Religious studies

A vocational subject

This implies that all the students, irrespective of their field of study are to take the listed compulsory cross cutting core-subjects. These subjects are always classified as:

- i. English language
- ii. General mathematics
- iii. One trade entrepreneurship
- iv. Computer studies/ICT
- v. Civic education

**Table 1**  
**Subjects in Specialized Field of Study in the Senior Secondary School Curriculum**

Humanities	Science and Mathematics	Technology	Business
Nigerian Language	Biology	Technical Drawing	Accounting
Literature -in-English	Chemistry	General Metal Work	Store Management
Geography	Physics	Basic electricity	Office Practice
Government	Further Mathematics	Electronics	Insurance
CRS	Agricultural Science	Auto -Mechanics	Commerce
Islamic Studies	Physical Education	Building Construction	
Visual Arts	Health Education	Wood -Work	
Music	General Mathematics	Home -Management	
Arabic studies		Food and Nutrition	
Economics		Dashing Textiles	

Sources: Lukman and Oviawe (2010)

### **The Senior Secondary School Curriculum and Entrepreneurship Skills Acquisition/Trade Subjects**

According to the national policy on education (FRN, 2004) the following constituent the entrepreneurship / trade subjects:

1. Auto body repair and spraying painting
2. Auto electrical work
3. Salesmanship
4. Marketing
5. Fisheries
6. Animal husbandry
7. Mining
8. Tourism
9. Photograph
10. GSM maintenance
11. Book keeping
12. Data processing
13. Short-hand
14. Key boarding
15. Leather goods manufacturing and repairs.
16. Cosmetology
17. Printing craft practice
18. Dyeing and bleaching
19. Textile trade
20. Garment making
21. Catering practice
22. Upholstery
23. Furniture making
24. Carpentry and joinery
25. Machine wood working
26. Plumbing and pipe fitting
27. Painting and decorating
28. Auto mechanical work
29. Auto part merchandising
30. Air conditioning/ refrigerator
31. Welding and fabrication engineering craft practice
32. electrical installation and maintenance work

33 Block laying, brick laying and concrete work

34 Radio, TV, and electrical work

The above curriculum for entrepreneurship and skills acquisition is well articulated its realization shall help to produce graduates, youths or people that can make use of their brain and hands as a result of their acquired creative knowledge and self-employment skills. According to Lukman and Oviawe (2010), such productive individuals are equipped with necessary professional competence, entrepreneurial abilities and rendering of service to ensure human survival and economic prosperity.

### **Benefits of Entrepreneurship Education and Skills Acquisition in Nigeria**

Obierika and Nwanchokor (2011) observed that the economic success of nation worldwide is the result of encouraging and rewarding the entrepreneurial instinct. It is the entrepreneur who serves as the spark plug in the economy's engine, activating and stimulating all economic activities. This shows that entrepreneurship education is important factor in the economic development of any nation. The following are some of the benefits derived from entrepreneurship education. They are:

- It gives an opportunity to utilize one's potentials.
- It gives the entrepreneur an opportunity to serve one's community and impact on their lives positively.
- It provides economic power for both the entrepreneur and the community.
- It gives the entrepreneur a lot of independence since he is his own boss.
- It provides a training ground for indigenous semi-skilled workers and managers.
- It reduces rural to urban migration by engaging a large fraction of the population in gainful employment.
- It helps to develop indigenous technology and raises the living standard of the people where such entrepreneurial organization is located.
- It boosts foreign exchange earnings for the country as indigenous products are exported.
- It eradicates poverty, and reduces the sufferings of the people by providing them with daily paid job
- A society that has most of its populace gainfully employed, societal ills and vices be reduced to its barest minimum.

### **Problems of Entrepreneurship and Acquisition in Nigeria**

The following are some of the problems facing entrepreneurship education and skills acquisition in Nigeria:

#### **Poor Funding of Education in Nigeria**

Poor funding of education in Nigeria has been one of the biggest problems facing the functionality of entrepreneurship education and skills acquisition. In the science, technology, home-economics and vocational education courses or subjects, money is needed to buy and install equipment. Where there is no money to provide the equipment, the education of the children towards entrepreneurial skills acquisition will be affected.

#### **Lack of Equipment and Instructional Materials**

As a result of inadequate funding of education, there is acute shortage of infrastructural facilities and equipment such as lecture rooms, machines, instructional materials because huge amount of money are needed to procure them. Obierika and Nwanchokor (2011) observed that facilities in entrepreneurship education are initial for two major reasons for effective instruction and for actual occupations or jobs for self-reliance. Inadequate equipment and instructional materials cannot favour entrepreneurship education. Students who receive such education cannot acquire the necessary skills that would make them confident and self-reliant.

### **Lack of School Seminars Workshops**

Seminars and workshops on entrepreneurship skills and attributes which are need by entrepreneur to succeed in business should be organized for students. In organizing the seminars/workshops, successful entrepreneurs and experts in trade areas should be invited to deliver lectures on entrepreneurship to broaden Students minds, knowledge, and helps them to know more about entrepreneurship practices. Such business skills as business planning skills, opportunity, recognition and selection, business ideas generation, resource management skills, time management, people management, customer's relation and marketing of goods and services should be taught. At times this is done in the schools.

### **Practical Entrepreneurship Skills Acquisition Counseling**

Lukman and Oviawe (2010) opined that the entrepreneurial teacher needs to counsel the students on the benefits, importance, significance and contributions of entrepreneurship education to the national development. There is need for the teachers and school authority/counselors to regularly organize practical counseling sessions to acquaint students with the skills of writing business plans, feasibility report, securing finances and establishing business. The issue of practical work should be taken seriously if students must acquire entrepreneurial skills.

### **Youth Laxity**

Some of our youth(s) in this country are no longer ready to work and achieve their daily bread. They engage in various vices in our higher institutions which consequently prevent them from acquiring the proper entrepreneurship skills in these institutions. These vice include: cultism, examination malpractice, hooliganism, armed robbery, neglect of their academic work and non-challant behavior among others.

### **Prospects of Entrepreneurship and Skills Acquisition In Nigeria**

The prospects of curriculum innovation in science and technology education vis-vis entrepreneurship and skills acquisition are very bright. Recently, the Federal Government charged all stakeholders in the education sector in Nigeria to work for the successful implementation of the newly introduced nine-year Basic Education Curriculum and the senior Secondary School Education Curriculum Structure. Ibe and Igwe (2010) called on the state government recently to provide adequate fund and enhance the professional standards of teachers and ensure equitable remuneration to make the curriculum workable. According to him, "the implementation of the 9-year basic education curriculum and indeed the senior secondary education curriculum is a task for all of us to tackle.

### **Stakeholders Summit on Education**

Goodluck (2010) recently summoned an emergency stakeholders' summit on education. The resolutions at the end of that summit indicated that henceforth, there will be increase in funding of education, overhaul of infrastructures improvement of academic and non-academic staff and packages.

### **Reduction in Crime/Corruption**

The inculcation of entrepreneurship education in our youths (students) will help in no small way to give them self-employment, a feeling of self-fulfillment, satisfaction will increase at the expense of greed and avarice that encourages corruption and other vices. When someone is gainfully employed, his mind is always occupied on how he will improve on his job which consequently attracts more rewards to him.

### **Increase in Industrial Development**

The inculcation of entrepreneurship education and skills acquisition will help to create the spirit

of exploration in students, this gives them the ability to create new things, new jobs which will also create employment opportunities in the country and eradicate poverty. This will also de-emphasize the interest of the students in politics which causes thurgery, kidnapping, armed robbery and other social vices thereby boosting industrial development (Ibe and Igwe, 2010).

### **Regular Field Trips to Entrepreneurs Workshops**

For effective entrepreneurship education and skills acquisition, there should be regular visits to entrepreneurs' workshops. Therefore, entrepreneurial education teachers should regularly organize visits to local, or states entrepreneur workshops for their students. Field trips (visits) afford students the opportunity of learning and becoming familiar with entrepreneurial and management skills.

### **Strategies Necessary, for Promoting Entrepreneurship Education and Skills Acquisition**

The following strategies will help in promoting entrepreneurship education and skills acquisition:

1. Organizing internship programmes for students.
2. Organizing seminars, workshops for students/teachers.
3. Practical counseling on entrepreneurship and skills acquisition for students.
4. Accessibility of loans, that is granting soft loan to graduates to enable them start of their various businesses.

Rewarding students that perform well in entrepreneurship and skills acquisition activities.

### **Conclusion**

The main aim of, entrepreneurship education and skills acquisition in Nigeria education system is to produce graduates (school leavers and university graduates) who are creative, confident and self-reliant. The education system should be functional and effective so that the students would be able to acquire entrepreneurial skills that would make them self-employed after graduation.

Entrepreneurship education and skills acquisition are very important in economic development of any country, therefore, all relevant agencies, and stakeholders in the education sector, especially those involved in entrepreneurship- education- in Nigeria should pay attention on skills acquisition which will enable our youths to be self-employed and consequently self-reliant. The curriculum of our schools should be structured to meet the needs of the society and the emerging new world order.

### **Recommendations**

Based on the usefulness of entrepreneurship education and skills acquisition in national development, this paper recommends that:

1. Graduating students should be made to undertake feasibility studies of entrepreneurial ventures of their interest and submit proposals as part of their requirements for graduation.
2. A deliberate policy to include entrepreneurship education and skills acquisition in school curricular should be made.
3. Entrepreneurship education and skills acquisition should be made available right from the primary level to the tertiary level.
4. Entrepreneurship education and skills acquisition should be compulsory at all levels of our education system
5. Adequate sensitization campaign should be carried out to educate people on the importance of entrepreneurship education and skills acquisition.
6. The local, states and Federal governments should fund entrepreneurship education properly by providing all the equipment, fund, facilities needed for its functionality in order to make our graduates self-reliant.
7. Monitoring and evaluation to assess the success of the link between entrepreneurship education and self-reliance, (Agi, 2011).

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## **Strategies for Promoting School-Industry Partnership for Sustainable National Development**

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### **Abstract: -**

This Paper has attempted to examine Strategies for Promoting School-Industry Partnership for Sustainable National Development considering the trend of employment in the recent years in Nigeria. It is no gain saying that one of the greatest problems facing Nigeria is how to provide employment to her teeming population. To tackle this problem, government has embarked on various types of social intervention programme aimed at either creating jobs for the unemployed or preparing students for existing jobs vacancies. The later is the major concern of vocational/technical education. This paper highlights the role of industry, in the developing vocational/technical education, means of strengthening the relationship, problems and issue of School-Industry relationship. Instructional model and strategies that will promote students transition from school to industry is also highlighted.

### **Introduction: -**

The success or failure of any economy depends on the functionality of its vocational technical education system. Osuala (2005) noted that vocational technical education is the only known source through which industry can get its steady supply of trained manpower. The fact that vocational technical education exists to service the industry is enough reason for the industry to forge a closed-working relationship with the vocational education system. Vocational technical education is the producer of the commodity (manpower) while the industry is the consumer.

Industry could not have existed if there were no personnel to man it. Neither would there have been any need for the vocational education to produce skilled personnel if not for the sake of the former. In this changing world, new technologies that keep emerging every day need new skills to service and maintain them, new managerial technique to take care of their ever growing and sophisticated private sector. The pressure on vocational technical school is even increasing. According to Bond (2006). Industry is expected to up-date the vocational technical education with enough information regarding the type of skills needed on regular basis.

Many people believe that the industry or private sector have not played its part well enough to promote a sustainable relationship between themselves, industry should really get involved in the welfare of vocational technical education so that the later could in turn produce skilled personnel who are adequate both in quantity and in quality. This paper attempts to highlight the possible steps and means capable of brining about a sustainable relationship between the two major sectors of the economy.

attempts to highlight the possible steps and means capable of bringing about a sustainable relationship between the two major sectors of the economy.

**The Role of Industry in the development of vocational/technical education:**  
Industry has to play a significant role towards the development of vocational technical education. Evidence has shown a significant involvement of the industrial sector in the following area of the vocation technical education (Udoninyang, 1994).

- (i) Having input in Curriculum development
- (ii) Proving training opportunities for an indepth development of the practical skills of the student of vocational technical school (ITF) (Asuquo, 2005)
- (iii) Providing employment opportunities to the graduates of vocational technical education

Yet enough has not been done to justify the enormous benefit it is enjoying from the services of the vocational technical education system.

#### **School –Industry Relationships:-**

Vocational/Technical school and industry are related as producer and consumers. Industry hires graduates of vocational/technical education for her manpower needs. There is also a relationship between and processes adopted (King 1994).

Having recognized these relationships both sectors own a duty to one another. For instances, education and industry should work together to ensure that students are given the right guidance at the right time and that curricula scopes contents and standards are relevant to the requirement of the employers. Such joint efforts will go a long way to bridge the gap between the fantasy in school and the reality in the world of work.

Ivancevich and Gfueck (1986) identified some benefits of providing vocational students with the competencies expected in the industry as follows; increase in work performance of student recruits, reduction in start-up costs and time spent an orientation; reduction in the amount of anxiety and factory phebar, reduction in the occupational accidents; gurantee of success at the work entry points creation of trainee confidence and assurance in the chosen careers and reduction in employec turn-over and occupational migration.

#### **Partnership Strategies for Promotion School –to Industry Transition:-**

The processes and methods of manging and acquiring occupational skills in vocational/technical education are many and varied. Wordu, (1993) classified these methods under three headings namely; Organisational Strategy; delivery Strategy; and Management strategy. Acquisition of industrial skills and information can be promoted by proper planning and management of these classes of instructional Strategies, strategies for school –to- industry transition include:-

1. Well Planned on-the job-training
2. student participation in part time work in career related to school work.
3. Use of guidance/carcer service
4. Proper selection and use of tools with high degree of closeness to those found in industry. This strategy variables is based on the theory of identical clements which promote transfer of training
5. Use of special methods such as role-playing, project work, audio-visual media and simulation devices.
6. Inviting professionals are resource persons to speak on careers and related issues.
7. Use of public relations to familiarize the public with what the school has to offer, school can organize alumni groups, employers' appreciation, banquet or hold

seminars and exhibition to bring the students and members of industrial sector together.

8. Use of industrial visitation to give students opportunities to see and reflect on the actual job practice and demand

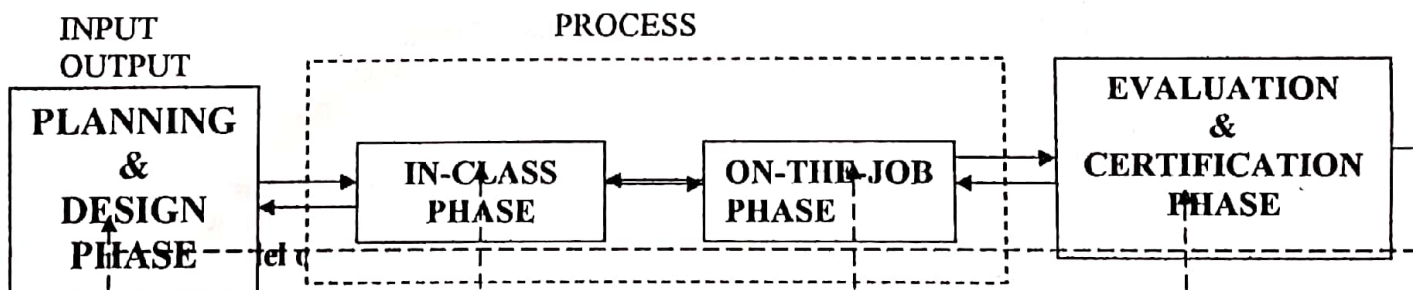
#### **Problems and Issues of School to Industry Relationship:-**

Despite the point that can be raised to support the industry programme in technology education, its full implementation has been with some attendant problems which tends to inject traits of setback to its viability and effectiveness in accomplishing its lofty objectives. This problems which are very critical and extensive militate against the full realization of this goals.

1. Inadequate training facilities
2. Most industrial personnel have practical knowledge but cannot blend it with the theory
3. Inadequate information between school authorities and the industries
4. Lack of funds.

#### **Model of School-to – Industry Transition Programme:-**

Recent innovation in the field of educational Technology has suggested the application of instructional system development (ISD) in finding solution to complex training and education problems (Wordu, 1993), ISD technique for training and education focuses on analysis, design, development and implementation of the distinct from the piece meal approach to instructional programmes, Adopting the principle of the ISD, the entire school-to-industry transition programme is looked at in its entirety, taking into cognizance all the Human Resource. Development Variables considered important. Figure 1 below showed a model of school to industry transition programme the model is an integrated whole comprising the input, process and output. The arrows show the direction of movement from one phase of training to another.



#### **Means of Strengthening the Relationship:-**

The socio-economic development of any nation demands a tripartite relationship amongst vocational education, industry and private sector. None of these three sectors can operate in isolation. Much as have agreed that vocational technical education or its curriculum is an instrument for social and economic advancement of any society. We can as well agree that vocation education can only serve other sectors only when they have made their problems known and how best they want then to be solved or when to solve them.

To maintain a better working Relationship amongst these sectors calls for proper planning. It is pertinent that industry and other related professional bodies as well as

organizations should continue to be involved in designing and managing job-oriented programme (Bond 2006). This opinion is in line with the National policy on Education (2004) which stated that: Industries and Government will be consulted when designing courses so that relevance's and greater practical impetus would be given and that membership of the boards will include representative from industry and other employers of labor.

**Conclusion: -**

Vocational technical education is considered to be the bedrock upon which economic development of a society-entrenched its root. The institution would be able to carry out its function only if the industry contributes its quota in such area as:

- i. Contributing to the designing and implementing of the technical education curriculum.
- ii. Financial assistance.
- iii. Provision of machineries/facilities.
- iv. Continue to contribute into Industrial Training Fund (ITF) and supervision of Students Industrial Work Experience Scheme (SIWES)
- v. Working out modalities for teaching assistance.

We can as well try some collaborative venture between the industry and vocational technical education as well as forming a committee that would oversee the implementation of technical education programme.

**Recommendations:-**

In order to ensure a sustainable relationship between vocational technical institutions and industry, the paper recommends the following steps as possible means to its achievement:

- i. Industry should contribute its input to help the vocational technical education know what it needs in terms of skilled manpower and when they are needed to enable the institution plan ahead of time.
- ii. Industry should contribute to the financing of vocational technical education. This should be in form of trust fund or yearly financial grant.
- iii. Industry should contribute to the designing and implementation of the vocational technical education curriculum.
- iv. Vocational technical education teachers should undergo short service training in industry in a regular basis. This will help to acquaint them with what is currently practice in industry.
- v. Collaborative venture programme between the vocational technical institution and industry should be encouraged.
- vi. Industry should continue to offer job opportunities to products of vocational technical education.
- vii. There should be legislation such that would bond industry and vocational education to each other.

It is the belief of the researcher that if the above stated means are followed religiously a more cordial and sustainable relationship between vocational technical education and industry would be enhanced.

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