Towards Effective SIWES Curriculum Development in Applied Sciences for Adequate Skills Utilization: A Case Study of the School of Applied Science, Nuhu Bamalli Polytechnic, Zaria.

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ABSTRACT

The Students' Industrial Work Experience Scheme (SIWES) was introduced to enhance the acquisition of marketable skills by students and graduates of Science and Technology in Nigeria. This paper carried out a survey on the views of students in the three departments of the School of Applied Science, Nuhu Bamalli Polytechnic, Zaria about the adequacy of the skills acquired during their participation in SIWES. Fifty questionnaires were used for the survey. From the data collected, many of the students suggested that the skills acquired are inadequate. This is because of the short duration and lack of modern facilities in their place of industrial training. Consequently, this paper makes a number of recommendations, including apprenticeship training for students to up grade their technical skills, among others.

(Keywords: students' industrial work experience scheme, SIWES, polytechnic education, training, educational reform Nigeria)

INTRODUCTION

Nigeria views science and technology as the most appropriate vehicle for the planned transformation of society (Jegede, 1995). It is for this reason that the educational system aims at helping students acquire appropriate skills, abilities, and competencies, both mental and physical, as well as equip the individual to live in society (Bajah, 1983). One of the aims of our national policy in education is to build a strong and self–reliant nation

Akerejola (2004) reported that the Industrial Training Fund (ITF) came into being with the promulgation of decree No. 47 of October as amended in 1990. Samuel (2005) remarked that the ITF had within a few years of operation with industries, identified a serious lack of practical skills of locally trained engineers and technologists. It observed that a wide gap existed between theory and practice of engineering and technology and other practical oriented courses in almost all Nigeria institution of Higher learning.

According to Akerejola (2004), in an effort to bridge this identified gap between theory and practice in our tertiary institutions, the ITF initiated the Students' Industrial Work Experience Scheme (SIWES) in 1974. The scheme was designed to provide the much needed on the job practical experience for students undergoing all courses that required exposure industrial activities during the school program. It was planned as a cooperation industrial inter-relationship between institutions of higher learning and industry/commerce in the country.

Applied Sciences are a job-oriented program with the primary aim of preparing self-reliant individuals, with acquisition of marketable skills. Presently, there are not enough facilities available in our institutions of learning to prepare these students for future challenges of self-employment and a nation building work experience scheme.

This paper intended to find out the views of the students of school of Applied Science, Nuhu Bamalli Polytechnic, Zaria on the adequacy of skills acquired during SIWES. The school has three different departments, namely, Science Laboratory and Technology, Computer Science, and Mathematics and Statistics.

OBJECTIVES OF SIWES

Samuel, (2005) highlighted the objectives of SIWES to include the following:

- Provide an avenue for students to acquire industrial skill; and experience in their course of study.
- Prepare students for industrial work situation they are to meet after graduation
- Expose students to methods and techniques in handling equipment and machinery that may not be available in their institutions.

Akerejola also listed the aims of SIWES as follows:

- Make the transition from school to the world of work easier and enhance students/ contacts for later job placement.
- Provide students with opportunity to apply their knowledge in real work situation, thereby bridging the gap between theory and practice.
- Enlist and strengthen employer's involvement in the entire educational process and prepare students for employment in industry and commerce.

Another primary purpose of SIWES, according to Ogunlade (1992), is the mass production of competent workers. A competent worker is a person who as the right attitude to work, a person who is always willing to reduce the cost of production and at the same time increase yield, a person who can easily adapt to new situation, who is flexible and versatile. Competent workers will enhance the country's competitiveness in the world market.

THE NEED FOR SIWES

The dynamic nature of the world of work is very fast, that our institutions trail behind. The normal school system naturally produce right thinking professionals with the mode of operation and attitude to work. Adetoro (1999) opined that Applied Science training needs actual work experience that has to be done either on a part time or full time basis in actual work environments. For example oil exploration methods can be taught in a college environment, but the actual experiences can only be acquired on oil exploration field.

Experts identified industrial visitation/experience as necessity for proper job preparation (Adetoro, 1999 and Nwaokolo, 1999). This is because productivity is enhanced by experience graduate or new entrance into the world of work really needs an early exposure to the value and skills of the industry. Therefore, without appropriate skills and experiences young graduates are not properly trained on work, norms, and role behavior among others, These components will ensure success at the job place.

In today Information and Computer Technology (ICT) age, technology is changing the way many jobs are performed, thus altering the knowledge and skills required of workers. Consequently, a new level of technical competency is required of our engineers and technologists. This cannot be sufficiently met by training facilities in our education institutions hence, the need for collaborative effort between institutions and industrial sector.

Another need for SIWES is that, since many lecturers/instructors entered teaching, new technology has significantly changed the nature of many jobs; ironically, there is need for students to acquire current practice on the field.

ADDITIONAL BENEFITS OF SIWES

- Students learn how to apply the latest technology in their professional callings.
- It helps to develop entrepreneurships skills in the students.
- It exposes students to critical skills, quality control measure and safety regulations in their field of work.

BACKGROUND TO THE STUDY

In order to be successful, students in Applied Sciences need actual work experiences or on the job training in actual work environments.

Industrial training will enable students to learn how to apply theories learnt in classroom to real life situation. It also allows students to be familiar with state-of-art practices in the world of work.

Statement of the Problem

- The period of industrial training is too short for students to acquire enough skill.
- After a long search, many of the students finally stayed to have industrial training in organizations that lack modern or state of the art facilities.

Purpose of the Study

- To investigate the competence of the cooperating organization in the provision of adequate training to students on SIWES, in terms of facilities and personal availability.
- To find out the major consideration by the students in the choice of place of attachment.
- To find out whether the duration of SIWES is considered adequate.
- To find out whether the students are given unhindered access to facilities at the place of SIWES or not.

Research Questions

1. Is the duration of training enough to acquire enough skills?
2. How competent are most of organizations where students had their training in term of facilities and personnel.
3. Why is it difficult for student to secure placement in well-equipped (personnel and facilities) organization?

METHODOLOGY

A self-designed questionnaire containing twenty-one items in six sections was employed for data collection for this study. The total populations used in this study are: 50 students in the School of Applied Science, Nuhu Bamalli Polytechnic, Zaria. The breakdown of students per department shown below is to reflect the actual students' population in each department: Science Laboratory Technology-25, Computer Science-15, Mathematics and statistics-10.

The students were selected randomly among students who had completed their industrial training.

Validation

A structured questionnaire was developed to elicit response from the students. It was made up of seven sections (A-G). Sections A-C were meant to collect background information about the respondents. Sections D-F contain general question on the organizations. Section G contains questions in a four-point Likert scale, with mean scores to determine the general remark. The key to the scales include: SA (Strongly agreed), A (Agreed), D (Disagree), SD (Strongly Disagree) X-mean.

Validity: Three experts in school of Applied Science and former SIWES coordinators at Nuhu Bamalli Polytechnic, Zaria validated the questionnaires. The instrument was restructured in line with suggestions made by these experts, before the questionnaires were administered. This helps to ensure the content and construct validities of the instrument.

Reliability: The reliability coefficient was computed using Pearsons Product Moment correlation methods, and the value of 9.5 was obtained.

Data Analysis: Numerical figures were awarded to each of the scale used in the questionnaires as follows;

Strongly Agree (S.A)	-	4
Agree (A)	-	3
Disagree (D)	-	2
Strongly Disagreed	-	1

Furthermore, the means score for responses on each questions was calculated to determine the remark. A mean score of 2.50 and above confirmed agreement, while a score below 2.50 means "Disagree".

DISCUSSION

From the analysis of data, all the students agreed that SIWES helps to equip them with marketable skills. This goes to show that they know the importance of industrial attachment.

Many students stated that their choice of placement of SIWES is not based on interest for future entrepreneurship development, but their convenience such as free accommodation and transportation e.t.c. this will not help the students to have a solid foundation for future job plan.

Some of the students who took part in the survey revealed that the place of their SIWES lack adequate modern facilities and personnel. This is not good enough for the country's technological development. Therefore, the Federal government should enforce the provision of ITF decree, which makes it mandatory for employers of labour to accept certain number of students for industrial attachment.

A

Department	No of Respondents	% of Respondents
Science Lab. Tech.	25	50
Computer Science	15	30
Mathematics and Statistics	10	20
Total	**50**	**100**

B

Sex Distribution	No of Respondents	% of Respondents
Male	22	44
Female	28	56
Total	**50**	**100**

C

Distribution of respondents per level	No of Respondents	% of Respondents
ND II	39	78
HND I	11	22
Total	**50**	**100**

D

Ownership of respondents SIWES Placement	No of Respondents	% of Respondents
Government	28	56
Private	22	44
Total	**50**	**100**

E

Person who Help in Securing SIWES	No of Respondents	% of Respondents
Self	32	64
Friends	6	12
Relatives	12	24
SIWES Office	0	00
Total	**50**	**100**

F

No of Staff in the Establishment	No of Respondents	% of Respondents
1	6	12
2-10	15	30
Above 10	29	58
Total	**50**	**100**

G

		SA	A	D	SD	MEAN (X)	REMARK
1	SIWES equips students with marketable skills	40	10	-	-	3.80	Agreed
2	The place of my SIWES is relevant to my course	26	14	10	-	3.32	Agreed
3	The SIWES placement was secured easily	2	5	11	32	1.54	Disagreed
4	I paid for SIWES training	4	-	-	46	1.20	Disagreed
5	The place of attachment was chosen because, I find it difficult to secure placement in well; established organization	20	12	10	8	2.88	Agreed
6	Placements are choosing because of personal benefits, such as free accommodation, free transportation.	32	8	7	3	3.38	Agreed
7	SIWES placement had adequate personnel who involved in the training of the student	8	12	15	15	2.02	Disagreed
8	The place of my SIWES had adequate modern facilities	6	9	15	20	2.02	Disagree
9	I was supervised adequately by my industrial based supervisor and college supervisor	10	39	7	3	2.86	Agreed
10	I was given unhindered access to most of the facilities in the place of SIWES	-	2	4	44	1.16	Disagreed
11	I was posted to work in almost all the sections in the place of SIWES	3	8	18	21	1.86	Disagreed
12	The place of my SIWES help me to acquire good skill	5	25	18	2	2.66	Agreed
13	The duration of SIWES was enough	-	10	17	2.3	1.74	Disagreed
14	With experience acquired at SIWES place I can set up my own ventures	-	1	3	46	1.1	Disagreed
15	After the SIWES, I believed I need more industrial exposure, before I can start my own venture	45	3	2	-	3.86	Agreed

Furthermore, some of the students claimed that there are some restrictions on the facilities they can use. This is not good enough for appropriate skills acquisition.

In addition, majority of the respondents believed that the duration of SIWES program is not enough for them to acquire skill that will enable them set up their own business ventures.

RECOMMENDATIONS

1. The majority of the students in this study opined that the duration of the industrial attachment is not long enough. Realizing the fact that it is not possible to extend the period of Industrial Training Fund because of other important programs such as teaching practice also requiring attention. Students who are yearning for more experience can embark on apprenticeship training with highly skilled mater – craft in the chosen field. The training can be conducted during the weekends.

2. The choice of industrial training should be based on the interest and future plans for entrepreneurial development rather than insignificant considerations such as free accommodations and cheap transportation as suggested by respondents of the study.

3. The SIWES unit in various institutions should be adequately equipped, as this will help to assist the students in securing placement of their interest.

4. Students should note that SIWES is an integral part of their studies where marketable skill can be acquired hence they need to be more serious about the training.

5. The Industrial Training Fund (ITF) should ensure that SIWES allowances for students are paid during the period of attachments. This will assist the students to settle down well, as the issue of feeding and transportation would have been taken care of.

6. At present, the SIWES students are paid the sum of two thousand, five hundred naira per month. The Federal Government should look at the possibility of increasing these allowances in view of the level of inflation in the country.

CONCLUSION

The industrial growth of a nation determines her economic, social, and political growth. Education in school system is not an – end in itself, but a means of achieving greater things in ones career. This is because Science training in school alone cannot teach the skills, experiences, values, and attitudes required for being successful in the world of work. Therefore, there is need for mutual cooperation between the school system and industry in raising the technical literacy of Technology, engineering and applied sciences students.

This study showed that majority of the students who go out in industrial training claimed that they did not receive adequate skills, because of their inability to secure placement in well – equipped establishments. Consequently, the law on SIWES, which make it mandatory for industrial establishments to accept students, should be enforced. In addition, incentives should be provided to organizations, which accept student for industrial training.

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