THE INTERNATIONAL JOURNAL OF BUSINESS & MANAGEMENT

Supervisors' Rating of Strategies for Improving School-Industry Linkages in Vocational Education in Tertiary Institutions in Anambra State

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Abstract:
This study presents supervisors' rating of strategies for improving school-industry linkages in vocational education in tertiary institutions in Anambra state. Two research questions and two null hypotheses guided the study. Descriptive survey design was adopted. The population of the study was made up of 389 supervisors' of industries located at Awka, Nnewi and Onitsha. A questionnaire containing 20 items with a reliability coefficient of 0.78 was used to collect data for the study. Mean ratings, z-test and analysis of variance (ANOVA) were used for data analysis in order to answer the research questions and test the null hypotheses. Findings showed that supervisors of industries considered training and administrative strategies important for improving school-industry linkages in vocational education in tertiary institutions in Anambra state. Gender has a significant effect on respondents' opinion while experience does not. It is concluded that the adoption of training and administrative strategies will facilitate school-industry linkages in vocational education. The researchers recommend amongst others that management of tertiary institutions should utilize all available administrative machinery to ensure effective SIWES implementation.

Key words: *Vocational education, school-industry linkages, SIWES*

1. Introduction

In every society, man has some specific duties to perform in order to live a happy life. As man continues to live in his environment, the demands and problems continue to increase in complexity, creating the need to equip man strongly with requisite skills to enable man to grapple with his environment. The need to equip man with appropriate skills for proper adaptation in his environment led to the emergence and development of vocational education in Nigeria.

Vocational education is used interchangeably with vocational training to mean that phase of education that equips its recipients at all levels with skill of knowing how to do practical activities. According to Smith (2002) and Danko (2006), vocational education is an educational programme that prepares students mainly for socially useful occupations requiring manipulative skills in fields such as trade, industry, agriculture, business education, painting, home economics among others. It is also designed to develop skills, abilities, understanding, attitudes, work habits and appreciations encompassing knowledge and information needed by the workers to enter and make progress in employment on a useful and productive basis. UNESCO (2002) sees it as an educational process involving general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life.

Vocational education as an educational programme in Nigeria, is offered in institutions of higher learning like universities and colleges of education. The fact that vocational education produces various levels of manpower for national development has made the Federal Government of Nigeria (FGN), to introduce the 35 trades in the secondary school system curriculum in order to make transition from secondary education to higher institutions easier and as well improve the manpower needs for the society.

The Federal Government of Nigeria (FGN) in recognition of the importance of vocational education, the need to boost the programme and equip learners properly with requisite practical skills based on the growing concern among industries that graduates of institutions lack adequate practical skills and knowledge required for employment. The claim made FGN to introduce the Industrial Training Fund (ITF) through decree No 47 of 6th October, 1971. The vision of ITF is to be the foremost skills training and development organization in Nigeria while its mission is to set and regulate training standards, offer direct training intervention in industrial and commercial skills training and development using a corps of highly competent professional staff, modern techniques and technology The essence of the ITF is to promote and encourage the acquisition of skills in industry and commerce with a view to generating a pool of indigenous trained manpower sufficient to meet the needs of the country. ITF was the first of the three Manpower Training and Development agencies created by the Federal Military Government during the Second National Plan period (1970-1974).

Industrial Training Fund (1989) explained that in its quest to bridge the gap between the theory and practice of allied discipline in Nigerian schools, and achieve its mandate initiated Nigerian version of linkage programme between schools and industries tagged the Students Industrial Work Experience Scheme (SIWES) in 1973. The SIWES programme is a training plan designed to prepare and expose students of tertiary institutions to real industrial work situation they are likely to meet after graduation. According to Information and Guideline for SIWES (2002), the duration of SIWES is four months in polytechnic carried out at the end of National Diploma (ND), four months in colleges of education carried out at the end of 200 level (NCE II) for three years programme, and six months in the universities carried out at the end of 300, 400 or 500 levels for students offering 400 or 500 years programmes respectively. The number of months a student should spend on SIWES depends on the students' discipline.

The purpose of SIWES according to Idiris (2007) is in consonance with one of the principles of vocational education which states that the workshop and industry in which the students will work after graduation should be a replica of each other. The Student Industrial Work Experience Scheme according to Ogwo (2000) is organized in a quadrilateral arrangement involving; ITF, coordinating agencies namely National University Commission (NUC), National Board for Technical Education (NBTE), National Commission for Colleges of Education (NCCE), the educational institutions and the industries. Okorie (2001) and Alagbe (2007) stated that SIWES as an arm of ITF has emerged as a stimulating factor in making students practical experience real and education meaningful to the students. Since vocational education exists to serve the industry, it is therefore, necessary that a high degree of linkage be developed and maintained between vocational education and industry through SIWES. Effective linkage will force both industry and vocational education institutions to share the needs, problems, issues, strengths and weaknesses encountered in producing competent and quality vocational education graduates that will meet the demands of the industries, labour markets and society generally.

2. School-Industry Linkages for Technological Growth in Nigeria

Vocational education programmes had existed for years in tertiary institutions in Nigeria, but a need still exists for effective school- industry linkage to ensure facilitation of economic boom through graduate quality. School-industry linkage is the collaboration between formal education and meaningful industrial work experience, which enable students to acquire knowledge, skills and appropriate attitude to work (Odu, 2010).

The need for the linkage is based on the fact that vocational training programs in tertiary institutions which suppose to uphold vocational principles of training students with a replica of tools, machines, and infrastructure existing in the industry and world of work, do not operate on this principle. The school environment is totally different in terms of equipment and facilities from industries and other employment agencies in which the students will work after graduation. The disparities constitute the major cause of lack of appropriate work skills and competencies required by the graduates of tertiary institutions in Nigeria. Olaitan, Nwachukwu, Igbo and Ekong (1999) remarked that training institutions in Nigeria are hardly able to renew their facilities to keep pace with technological progress. In most schools for instance, these equipment and facilities are lacking while some were in dilapidated or in obsolete conditions necessitating industrial e actions by unions in tertiary institutions in recent years. This according to Okorie (2000) may be one of the reasons why private employers often comment that universities and other vocational institutions have little or no practical work content. These problems justify the need for SIWES to be properly organized with well coordinated and effective linkage between vocational institutions and industries in order to meet the needs of students while in schools and after graduation. The major problem of SIWES in Nigeria is lack of proper implementation, commitment and negative mindset among tertiary institutions, industries, government and coordinating agencies and this affect graduates' quality.

The benefits of school industry linkage include: effective planning for both parties regarding students posting and proper supervision during the exercise; sharing of information regarding the exercise before, during and after; sharing of equipment, machines, and physical facilities, programme design and software development, giving assistance in areas of resource personnel; technical advice and curriculum content update and innovations. To this end, UNESCO (2002) pointed out the following benefits of linkage between vocational education and industry:

- Students benefit from early introduction to the world of work as a result of practical work experience.
- Educational institutions need the advice of the world of work to adapt their curricular to the needs of the labour market, to have access to the latest technology and to guarantee adequate teacher training. Additional sources of income from joint projects with enterprise may be tapped.
- Enterprise can profit directly from cooperation at different levels and thus, identify at an early stage students with the greatest potential for a future long-term contract.

For effective school – industry collaborative exercise to prevail in Nigerial, there must be total commitment from both parties in areas such as joint needs assessment, joint organization and placement of students in relevant industries,joint training arrangement, properly organized field trips and excursion; curriculum review, programme design and development, and joint research on new innovations.

There are lots of training linkages which developed and developing countries have found very useful in graduate preparation and have efficiently and effectively utilized them. UNEVOC (2003) in its study found out that various training linkages are very effective and are utilized effectively by various countries. For instance, Spain and Finland introduced a system of practice contracts between vocational training centers, institutions and employers which took the form of on-the-job training, supervised practice or acquisition of industrial work experience. In Mauritius, personnel from industry are actively involved in training programmes and also serve on the examination board. In Republic of Korea, cooperative education has been initiated by the government and according to the education – industry promotion law; all vocational students should have practical experience from industry as part of their regular courses. In Poland however, the practical training of vocational students takes place at school workshops and in the industries. This is a form of shared facilities found in Portugal. The report also revealed that in Portugal

vocational education establishment enter into contractual agreement with enterprises, determining the right and the obligations of the two parties and specifying also the entitlement and the obligation of each trainee. In Thailand and Zimbabwe, industries offer technical and financial assistance to vocational institutions.

In a related development, UNESCO (2002) in its study revealed that some countries have found an effective way to train their manpower in new technologies through cooperation between advanced industries and training establishments which involve:

- Use of industrial equipment by trainers and educators on companies premises
- Joint, cooperative programmes of research and training management system; and
- Donation of specific equipment to the training institution by industrial and commercial enterprise

Based on the fact that other countries have tested and found linkages between vocational education institutions and industries as an effective means of training students and industrial employees in latest technologies by closing the skills and competencies gaps, Nigeria should try and adapt the same practice. This involves finding effective means of improving linkages between school and industries for proper SIWES implementation.

2.1. Purpose of the Study

The purpose of this study is to ascertain the supervisors' rating of strategies for improving school – industry linkages in vocational education in tertiary institutions for improved graduate quality in Anambra State, Nigeria.

2.2. Research Questions

This study was guided by the following research questions:

- How important do supervisors' rate different training strategies for improving school-industry linkages in vocational education in tertiary institutions in Anambra state?
- How important do supervisors' rate different administrative strategies for improving school-industry linkages in vocational education in tertiary institutions in Anambra state?

2.3. Hypotheses

The following null hypotheses were tested at 0.5 level of significance.

- There is no significant difference in the mean ratings of respondents on training strategies for improving school-industry linkages in vocational education in tertiary institutions in Anambra state as a result of gender (male and female).
- There is no significant difference in the mean ratings of the respondents on the administrative strategies for improving school-industry linkages in vocational education in tertiary institutions in Anambra state as a result of years of experiences (1-5 years, 6-10 years, 11 and above).

3. Method

The study was conducted using descriptive survey design. The study was carried out in Anambra State Nigeria. The choice of the area is based on the fact that there are a good number of industries and tertiary institutions in the state. The population of this study consists of all the 389 supervisors of industries that are registered with the Anambra State Chamber of Commerce Industries, Mines and Agriculture (ACCIMA). Information from ACCIMA showed that Anambra State has three industrial zones located at Awka with 26 industries, Nnewi 65 industries and Onitsha 298 industries. This gives a total of 389 industries duly registered and viable. The instrument for data collection was a structured questionnaire designed by the researchers and validated by experts. The instrument has four response options of V1 (very important) =4points, I (important) = 3points, FI (fairly important) = 2 points and U (unimportant) = 1 point. The reliability of the instrument was established using test re-test method. The respondents' responses were analyzed using the Pearson Product Moment Correlation Coefficient Formula which yielded a reliability coefficient of 0.78. The data collected was analyzed with the arithmetic mean to answer the research questions while z-test and ANOVA were used to test the null hypotheses as 0.05 level of significance. Any item with the mean ratings of 2.50 and above was considered an important; any item with the mean ratings of 1.50 to 2.49 was fairly important item while any item with the mean score less than 1.50 was considered unimportant item. For the hypotheses, null hypothesis one is accepted if the z-calculated is less than the z-critical and not accepted if the z-calculated is greater than or equal to the z-critical, while null hypothesis two is accepted if the f- calculated is less than the f-critical and not accepted if the f-calculated is greater than or equal to the f-critical.

4. Results

S/N	Training Strategies for Improving School Industry Linkages	Male	Female	$\bar{X}$	SD	Remarks
1.	Assistance by industry in conducting research on matters relating to vocational training	3.59	3.43	3.51	0.61	Important
2.	Placement of students on industrial training programme as sole responsibility of the employer	3.16	3.11	3.14	0.85	Important
3.	Scholarship by industry to students with outstanding performance during industrial training	3.06	3.33	3.20	0.73	Important

4.	Acceptance of students on field trips and excursions by the industry	3.44	3.56	3.50	0.61	Important
5.	Introduction of industrial fellowship for teachers	3.59	3.56	2.58	0.91	Important
6.	Proper orientation for vocational students in industries before commencement of industrial training	3.47	3.56	3.52	0.61	Important
7.	Organizing workshop for vocational students by the industry for practical training	3.03	3.50	3.27	0.72	Important
8.	Providing flexible study schedule by the industry to enable students explore the wide range of available learning opportunities	3.00	3.44	3.22	0.61	Important
9.	Inviting experts from industry to the school as resource person to demonstrate skills and production techniques to vocational students.	3.19	3.72	3.46	0.77	Important
10	Organizing short practical courses in the industry for vocational teachers to update their knowledge and skills	3.38	3.67	3.53	0.57	Important
11.	Effective industrial training supervision by school-industry based supervisor	3.31	3.56	3.44	0.65	Important
	Grand mean	**3.20**	**3.49**	**3.31**	**0.70**	**Important**

Table 1: Mean scores of respondents' opinions on training strategies for improving school-industry linkages in vocational education

Information contained in Table 1 shows the grand mean scores of 3.31, with the mean ratings of the 11 items ranging from 2.58 to 3.53. This indicates that the respondents considered all the listed training strategies important for improving school-industry linkages in vocational education.

S/N	Administrative Strategies for Improving School-Industry Linkages	Male	Female	$\overline{X}$	SD	Remarks
1.	Redesigning job during the training to avoid boredom and loss of interest	3.19	3.33	3.26	0.55	Important
2.	Recognition and appreciation by school to the industry for accepting students on the industrial training.	3.31	3.17	3.24	0.48	Important
3.	Constant communication between school and industry on student trainee.	3.16	3.33	3.26	0.38	Important
4.	Provision of effective reward system by the industry for outstanding performances of student during the training.	3.00	3.00	3.00	0.68	Important
5.	Organization of joint co-operative programme of research between vocational education institution and industry.	3.00	3.00	3.00	0.56	Important
6.	Giving vocational education teachers opportunity to upgrade their skills in industries from time to time.	3.28	3.50	3.39	0.55	Important
7.	School liaises with industry in order to obtain available vacancies for student training.	3.22	3.28	3.25	0.58	Important
8.	Awarding contract for supplies and repairs/maintenance of school equipment to industries.	2.66	3.00	2.83	0.82	Important
9.	Encouraging vocational education teachers and industry to form professional association.	2.69	2.72	2.71	1.00	Important
	Grand mean	**3.06**	**3.15**	**3.10**	**0.62**	

Table 2: Mean scores of respondents' opinions on administrative strategies for improving school-industry linkages in vocational education

Result in Table 2 shows the grand mean score of 3.10, with the mean ratings of all the 9 administrative strategies ranging from 2.71 to 3.39. This indicates that respondents considered the listed administrative strategies important for improving school-industry linkages in vocational education.

5. Hypothesis Testing

5.1. Hypothesis 1

Gender	$\overline{X}$	SD	N	α	z-cal	z-crit	Df	Result
Male	3.20	0.49	224					
				0.05	3.97	1.96	348	Reject
Female	3.49	0.40	126					

Table 3: Z-test analysis of difference in the mean scores of male and female supervisors' on training strategies for improving school-industry linkages in vocational education

Df=degree of freedom. Z-crit..= z critical value. Z- cal. = z calculated value. @= p0.05
Information contained in Table 3 shows the degree of freedom of 348 at 0.05 level of significance with z-calculated value of 3.97 and z-critical table value of 1.96. This implies that there is significant difference in respondents' mean ratings on training strategies for improving school-industry linkages in vocational education as a result of gender. The hypothesis is, therefore, rejected.

5.2. Hypothesis 2

Sources of variance	$\overline{SS}$	DF	MS	F-cal	F-crit	α	Decision
Between groups	0.11	2	0.06				
				0.86	3.40	0.05	Reject
Within groups	1.66	24	0.07				
Total	**1.77**	**26**	**0.13**				

Table 4: ANOVA of difference in the mean scores of respondents' on administrative strategies for improving school-industry linkages based on experience (1-5years, 6-10years and 11years and above)

Information in Table 4 contains the result of the ANOVA test at 0.05 level of significance. The test indicates that the f-calculated value of 0.86 is less than the f-critical table value of 3.40. This indicates that there is no significant difference in respondents' opinions on curriculum strategies for improving school-industry linkages in vocational education as a result of experience. The hypothesis, is therefore, upheld.

6. Discussion of Results
The result of the analysis of training strategies as shown in Table 1 revealed that supervisors' of industries considered the listed training strategies important for improving school-industry linkages in vocational education. The findings revealed that acceptance of students on field trip and excursion, proper orientation for vocational students, organizing workshops and conferences are some of the training linkages that should exist between school and industry. The findings are supported by the view of Ogalanya (1996) who suggested that, for school-industry collaborative exercise to be as dynamic as possible there should be planned study trips and excursions, proper orientation of students and workshop/seminar. Through trips and excursions, students could get first hand information on new techniques processes and current development in the industry. Proper orientation on the purpose of the exercise, responsibilities, rules and regulation for on-the job training should be great advantage in the linkage. Also the organization of seminars, workshops and conferences could sensitize the industry about the importance of mutual relation with vocational institutions. This is necessary since both parties tend to benefit from the exercise. This is further in line with the recommendation of Luggujo and Manyindo (1999) that workshop should be organized between vocational institutions and industries to deliberate on the critical issues pertaining to the linkage.
The findings also revealed that assistance by industry in conducting research on matters relating to vocational training is important for school-industry linkages. This corroborate the views of Kerre (1999) and Odugbasan (1999) that organizing research and consultancy services by the institutions for industry participation and appreciation for services rendered will be of immense benefits to the schools and industries. To buttress this, Panapantor (2004), maintained that recognition is the most available tools that administrators can use in bolstering image. Furthermore, the study revealed that gender has a significant effect on the views of respondents regarding training strategies for improving school-industry linkages.
The analysis on Table 4 indicates those supervisors' considered listed administrative strategies important for improving school-industry linkages in vocational education. The findings revealed that redesigning of students' job during training to avoid boredom and loss of interest, recognition and appreciation by schools to the industries for accepting students on industrial training. Similarly, constant communication between schools and industries on students' training are some of the administrative strategies for improving school-industry linkages in vocational education. Panepantor (2004) maintained that recognition is the most available tools that administrators can use in bolstering image. An administrator needs not to wait for a major accomplishment to occur before showing appreciation of one's effort. Even the simplest of virtues are worthy of recognition. The analysis of variance on Table 4 shows that the respondents have no significant difference between their opinions on administrative strategies for improving school-industry linkages in vocational education.

7. Conclusion

The school-industry linkages can only be achieved in our country Nigeria when schools, industries and Nigerian populace generally are ready, and willing to change their mindset towards the SIWES exercise. Everybody needs to be committed in getting the exercise perfected by doing the correct thing at the right time. This implies that the vocational institutions should be dynamic in their administrative practices, appreciating industries for accepting to train students through letters, initiate supports and encourage those programmes that can improve the linkage such as organizing seminar, workshops and conferences where industrial supervisors will be resource persons. When this is properly done, it will definitely go a long way in improving cooperative link between school and industries in Nigeria.

8. Recommendations

The following recommendations are made in this study.

- Vocational institutions should use all available administrative machinery to collaborate with industry for effective SIWES programme implementation.
- Seminars, field trips and excursion should be incorporated into the academic curriculum as planned activities. This will help to expose students to real work environment while still undergoing academic training.
- Vocational institutions should show recognition and appreciation to industry for accepting to train students during industrial training exercise. Appreciating the efforts of industries will motivate other industries to help future students.
- Vocational education departments should always organize school-industry activities such as seminars and workshops for students and staff by writing experts from industries as resource personnel. This will provide opportunities for both parties to share the strength and weaknesses concerning the SIWES exercise.
- The coordinating agencies of the programmes such as the National Universities Commission (NUC), National Board for Technical Education (NBTE) and National Council for College of Education (NCCE) should collaborate to work out modalities for proper implementation of SIWES programme using training and administrative strategies.

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