

THE INFLUENCE OF TECHNICAL VOCATIONAL EDUCATION AND TRAINING (TVET) ON SKILL ACQUISITION AND DEVELOPMENT OF CRAFTSMEN IN THE CONSTRUCTION INDUSTRY

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Abstract— Technical Vocational Education and Training (TVET), as entrenched in the Nigerian National Policy on Education, (NPE) identifies one of the aims of TVET to be that of giving training and imparting necessary skills leading to the production of craftsmen and self-reliant technicians and technologists in Technical & Vocational areas. Specifically, in construction trades, the construction industry faces different, challenges in area of skilled artisans/craftsmen. Therefore, the paper is designed to find out the level of competency skill possessed by craftsmen, contribution of TVET institutions in preparing competent workforce and strategies for improving skill acquisition of craftsmen in the construction industry. A descriptive survey research design was used. A duly validated structured questionnaire on 5 points rating scale was used for data collection. The population for the study consists of 115 engineers/site managers in the construction industry and TVET teachers. Data were analyzed using mean, SD and t-test statistics to test the null hypotheses at 0.05% level of significance. Analysis through the use of SPSS computer programme was carried out on the responses of 107 respondents who returned the questionnaires. The findings revealed among other things that: majority of craftsmen are not competent in handling the job; TVET institutions have not been fully involved in the training of craftsmen especially those who acquired their skills through the apprenticeship training scheme. It is recommended that TVET institutions should improve on preparation of craftsmen to sufficiently enhance skilled workers in order to satisfy the needs of the construction industry. Considering the nature of TVET programme, TVET institutions should focus their research work on promoting skill acquisition and development of employable workforce.

Index Terms— Technical Vocational Education and Training (TVET); Skill Acquisition; Craftsmen; Construction Industry and Skill Development.

I. INTRODUCTION

Technical Vocational Education and Training (TVET) is one of a recognized and effective means by which quality, up-to-date, well-informed, literate and knowledgeable workers are prepared and trained for the development of the nation. Federal Republic of Nigeria (FRN, 2004) describes TVET as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. In a nutshell, TVET is a means of preparing for occupational fields and for effective participation in the world of work and alleviating poverty.

TVET facilitates the acquisition of the practical and applied skills as well as basic scientific knowledge. It is therefore a planned program of courses and learning experiences that begin with exploration of career options, basic academic and life skills, and enables achievement of high academic standards, leadership, preparation for industry-defined work, and advanced and continuing education (CTE, 2009).

Nuru (2007) indicated that changes in a country's economy is required to prepare young people for job of the future and TVET has important role to play in this process. The aim of TVET is to prepare people for self-employment and in addition be a medium of training people for the world of work; by making individuals have a sense of belonging in their communities. Consequently, TVET is seen as an instrument for reducing extreme poverty (Hollander and Mar, 2009).

Technical Colleges are the principal technical institutions established to equip students with relevant technical skills as craftsmen in various occupations. Technical Colleges are secondary level of Nigerian educational system which offer skill-based subjects in construction trade which among others include (wood trades: machine, carpentry and joinery, furniture making and upholstery while building trades are: block laying, bricklaying and concreting, painting and decorating; plumbing and pipe-fitting). The construction industry consists of a diverse group of sub industries, with many individuals and organizations involved in the construction of a single structure. It is obvious that skills enhance employability and productivity as well as sustain competitiveness in the global economy. Skill development is the ability to do or perform an activity that is related to some meaningful action, work or job. In contributing to this, Okorie (2000) points out that to develop a particular skill is to exhibit the habit of thinking, acting and behaving in a specific activity in such a way that the process becomes natural to an individual through constant practice.

Construction trades teach individuals the systematic skills, knowledge and attitude involved in the production of specific products or services. It incorporates the total learning experiences acquired in abilities to make matured judgments and be in a position to create goods and services in the area of block –laying, concreting, plumbing, painting, carpentry and joinery, furniture/cabinet making, wood machinist and upholstery work. TVET play a crucial role in the social and economic development of a nation. Owing to their dynamic nature, they are constantly subjected to the forces driving change in the schools, industry and society. Mechanized farming requires technical skills that could be obtained in technical and vocational schools. The real tests of success of TVET are the employability of the graduates, personal development, opportunities for further education and career development, public acceptance and image. Ultimately, the effectiveness and responsiveness of a VTE system would be its impact on the social and economic development of the nation. (Okafor, 2011) It is obvious that skills enhance employability and productivity as well as sustain competitiveness in the global economy.

Skill is ability possessed to carryout activities with ease and accuracy. Osuala (1999) refers to skill as the ability to perform expertly, facility in performance, dexterity and tact. Skill therefore, is the outcome of the training given to a student or an employee to make him/her perform more expertly and easily on his job by using his knowledge effectively and readily in execution of his performance. Skill development according to Okorie (2000) varies with the nature, complexity and type of activity that is involved. Skill development requires intelligent humans. Indeed most learned or developed skill present great challenges to students in the integration of the practical work and theoretical fields, ‘common sense, a good power of observation and courage’ (Okorie 2000, p. 84). An individual who opt for skill development should among other things,

The problem of why there is a high level of TVET graduates who are unemployable arises from lack of skills or competency required of them in Nigeria, despite the fact that the summary of the objectives of TVET is to enable students secure employment either at the end of the whole course of after completing on or more modules of employability skills forms the basis for this paper.

II. STATEMENT OF THE PROBLEM

Technical colleges are the principal technical institutions established towards producing craftsmen in various occupations. It is a paradox that a large number of Technical College graduates go jobless for years, while service and construction industry complain of lack of skilled workers. Boeteng and Ofori-Sapong (2002), observed that experience requirements are now stated in terms of competencies and skills rather than years. The result of a study carried out on graduate turnout, skills and graduate unemployment in Nigeria by Akinyemi, Ofem & Omore (2010) shows that Nigerian graduate largely, lack basic skills and competence that are needed in the modern workplace. Adeyemo (2010), observed from a survey carried out on TVET graduate employability in Nigeria, that there was a mismatch between the technical college graduates and labour market demands. Skills mismatch according to Nzekwe & Izueke (2013) is a situation where an individual lacks the basic mental, (even though he has had formal education), social, practical and developmental skills that will enable him to function effectively at assigned jobs and handle everyday work challenges. To collaborate this, the Nigerian Employers Consultative Association, NECA (2000) asserted that companies were not recruiting but adopting employment protection strategies due to the very poor quality graduates, who do not meet the demands of industry. In other words, job seekers possess skills that do not match the needs and demands of employers (McGrath 1999; Kent and Mushi, 1995). It simply means that majority of them cannot handle the job they go for. The inability of TVET graduates to get employment due to lack of skill and competence for gainful employment will therefore likely result in unintended consequences like armed robbery and other social vices. Therefore, TVET institutions need to give training that will prepare people for (self-) employment and be a medium of evolution for people in the world of work.

III. PURPOSE OF THE STUDY

The major purpose of the study is to find out the influence of Technical Vocational Education and Training (TVET) on skill acquisition and development of craftsmen in the construction industry. Specifically, the study sought to determine the competence level of skills possessed by craftsmen, contribution of TVET institutions in preparing

competent workforce and means of improving skill acquisition of craftsmen in the construction industry.

IV. RESEARCH QUESTIONS

In line with the purpose of this study, the following research questions are raised for the study:

- What are the competence levels of skill possessed by craftsmen in the construction industry?
- What are the levels of contribution of TVET institutions in preparing competent workforce for the construction industry?
- What are the strategies for improving skill acquisition of craftsmen for the construction industry?

Hypotheses

Ho₁: There is no significant difference in the mean responses of site managers/engineers in the construction industry and Technical Teachers in Technical Colleges on the competence level of craftsmen in the construction industry.

Ho₂: There is no significant difference in the mean responses of site managers/engineers in the construction industry and Technical Teachers in Technical Colleges on strategies of improving skill acquisition of craftsmen in the construction industry.

V. RESEARCH METHODOLOGY

The study was descriptive survey with researcher-designed questionnaire for data collection. Survey research design was considered appropriate, through survey approach, researcher identifies present condition, prevailing needs as well as provides information on which to base sound decision. It was conducted in Lagos State, Nigeria. The choice of this zone was motivated by the fact that this state is well known as the economic nerve centre of Nigeria. The population of this study comprises of 39 engineers/site managers in the construction industry and 68 Technical Teachers in 5 State owned Technical Colleges in Lagos State. The questionnaire has four sections A to D. Section 'A' sought information on personal data of the respondents: section 'B' 'C and 'D, raised items that address research questions 1, 2 and 3 respectively. The items were structured on a Likert scale. The questionnaire was subjected to both face and content validation by two experts from the university of Lagos, Akoka and a manager in the construction industry. The internal consistency of the instruments was determined using Cronbach Alpha. The instrument was administered on 23 Technical Teachers in Federal Science and Technical College, Yaba, Lagos. The reliability coefficient established were as follows: Section B $\alpha = 0.79$; Section C $\alpha = 0.74$; Section D $\alpha = 0.78$ and overall $\alpha = 0.88$. The instrument was administered by the researchers through research assistant, and personal contact. Out of 115 questionnaires administered, 107 were duly filled and returned

by the participants. These represented 93% rate of return. SPSS was used in the data computation. Mean was used to answer the two research questions. Any item with mean of 3.50 and above was considered agreed upon while less than 3.50 were considered disagreed upon; t-test statistics was used to test the hypothesis at 0.05% level of significance.

VI. RESULT AND DISCUSSION OF FINDINGS

In order to investigate the competence level of skills possessed by craftsmen in the construction industry, mean and standard deviation were employed. Mean and standard deviation were presented in Table 1

Table 1: Respondent Responses on Competence Level of Skill Possessed by Craftsmen in the Construction Industry N=107

| S/N | Competence level of Skill Possessed by Craftsmen in the Construction industry | Mean | SD |
|-----|--|------|------|
| 1 | Ability to prepare work plans that will facilitate the achievement of quality standard. | 2.28 | 0.79 |
| 2 | Competency in the quality documentation in accordance with site/workshop requirements. | 1.92 | 0.76 |
| 3 | Ability to check plant and equipment to ensure they are in good working order in accordance with manufacturers' specifications. | 2.28 | 0.79 |
| 4 | Skill to allocate work by considering factors such as individual's competency level and their capacity to complete work requirements. | 2.11 | 0.12 |
| 5 | Ability to manage multiple tasks and resources simultaneously. | 2.27 | 0.94 |
| 6 | Capability to carry out work activities in accordance with relevant environmental procedures including sustainable energy work practice. | 2.44 | 0.79 |
| 7 | Skill in using various safety devices on-the-job in construction work | 3.69 | 0.75 |
| 8 | Ability to prepare and manage effectively the construction materials required for the job | 3.59 | 0.67 |
| 9 | Competence in the use of methods of construction and ability to follow work procedure effectively | 3.97 | 0.93 |
| 10 | Ability in learning from past experience so that new and better ways of working are practiced | 2.72 | 0.79 |
| 11 | The capacity to perform required tasks to the standards described in the unit of competence | 2.63 | 0.56 |

The mean ratings of respondents, site/workshop managers and technical teachers on the variables of competence levels of skill possessed by craftsmen in the construction industry were computed and presented in table 1, and 3.50 as the baseline for agreement on competence. The competence levels of skills possessed by craftsmen in the construction industry on each variable can be seen from the mean ratings. From the mean

responses it would be seen that the respondents disagreed with 8 (eight) out of 11 (eleven) of items of competence listed which include: ability to prepare work plans that will facilitate the achievement of standard quality competency in complete relevant quality documentation in accordance with the site/workshop requirements; capability to carry out work practice and the capacity to perform required tasks to the standards described in the unit of competence.

In order to investigate the contribution of TVET institutions in preparing competent workforce for construction industry, mean and standard deviation were employed. Mean and standard deviation were presented in Table 2.

Respondent Responses on Contribution of TVET Institutions in Preparing Competent Craftsmen for the Construction Industry. N= 107

| S/N | Contribution of TVET Institution in preparing Competence Workforce For the Construction Industry | Mean | SD |
|-----|---|------|------|
| 1. | Provide opportunities for personnel to Contribute to training plan and seek Clarification on training and work competence matters | 2.63 | 0.56 |
| 2. | Provide appropriate on -the -job training to fill identified skill gaps and improved Work performance of craftsmen | 2.46 | 0.68 |
| 3. | Developing an awareness of learning methods and options, such as training, shadowing others, coaching and mentoring | 1.92 | 0.76 |
| 4. | TVET actively using feedback from site/workshop managers, subordinates and peers to improve craftsmen performance | 3.39 | 0.49 |
| 5. | Informing trainees on the updates and changes to organizational policies, procedures and regulations | 3.87 | 0.71 |
| 6. | Using information technology to assist trainees in communication and support Management and planning function | 3.69 | 0.46 |
| 7. | TVET provide relevant safety systems information to access, analyze and to Assist in or confirm hazard identification | 2.77 | 0.71 |
| 8. | Developing strategies and learning new skills to adapt to workplace and Environmental changes | 3.71 | 0.82 |
| 9. | Assistance in development and presentation of proposals for resource Requirements in line with operational planning processes | 2.53 | 0.61 |
| 10. | Provide instructions, procedures and other information relevant to the Maintenance of personnel and equipment | 3.79 | 0.63 |

From table 4 above both site managers/engineers and technical teachers disagreed on more of the variables on the contribution of TVET institutions in preparing competent craftsmen. The table shows that the respondent disagreed on items 1, 2, 3, 4, 7 and 9 which include, provide opportunities

In order to determine the strategies for improving skill acquisition of craftsmen in the construction industry, mean and standard deviation were employed. Mean and standard deviation are presented in Table 3.

Table 3: Respondent Responses on Strategies for Improving Skill Acquisition of Craftsmen in the Construction industry N= 107

| S/N | Strategies of improving Skill Acquisition in the Construction the Industry | Mean | SD |
|-----|--|------|------|
| 1. | TVET curriculum should feature new teaching techniques that combines both theory and practical training | 4.06 | 0.87 |
| 2. | TVET Institutions should take initiative and collaborate with business and industry in areas of internships and curriculum development | 3.96 | 0.92 |
| 3. | TVET Institutions can invite professionals from industry to take on industry-based research to promote innovations leading to increase competitiveness | 4.14 | 0.43 |
| 4. | TVET Institutions should work in partnership with industry to ensure employment, employee training and their continuing education | 4.08 | 0.54 |
| 5. | Government should encourage and promote institution -industry collaboration and establish a system, guided and coordinated by industrial associations | 4.21 | 0.83 |
| 6 | TVET Institutions should undertake relevant work assessments in accordance with industry and business requirements | 3.95 | 0.71 |

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|-----|--|------|------|
| 7. | TVET Institutions should develop site safety plan which identifies all relevant site safety features in accordance with company requirements | 4.08 | 0.75 |
| 8. | Professional development activities should be undertaken to update trainee understanding of current industry/work practices | 4.12 | 0.80 |
| 9. | TVET Institutions should ensure that learning and assessment strategies address the levels of performance stated in the unit and the workplace context | 3.31 | 0.73 |
| 10. | TVET should update knowledge and skills to accommodate changes in skills, competence and operating procedures | 3.97 | 0.93 |

Table 5: t-test Results of Strategies of Improving Skill Acquisition of Craftsmen in the Construction Industry N=107

| Strategies | | X | SD | F | ρ |
|------------------------|---|-----|-----|-------|-------|
| Site manager/engineers | 9 | .63 | .48 | 0.658 | 0.512 |
| Technical Teachers | 8 | .20 | .38 | | |

Table 5 shows that there was no significant difference in the mean ratings of both groups of respondents with a t-test of 0.658, the mean ratings of site manager/engineers is 4.63 and that of technical teachers is 4.20. The P value is greater than the significant level of the study, 0.5.

Therefore, both groups were of the view that those strategies identified will be effective in improving competence of craftsmen in the construction industry have been ineffectively implemented.

VII. DISCUSSION OF FINDINGS

Site manager/engineers in the construction industry and technical teachers’ opinion regarding the competency level of craftsmen, contribution of TVET institutions in preparing competent craftsmen and strategies of improving skill acquisition of craftsmen in the construction industry was carried out. The findings from the data presented in Table 1, revealed that site manager/engineers in the Construction industry and technical teachers in technical colleges hold the view that craftsmen are not competent in handling their assigned job. Respondents emphasized that craftsmen are not competent in preparing work plans that will facilitate the achievement of standard quality; complete relevant quality documentation in accordance with site/workshop requirements; carry out work activities in accordance with relevant environmental procedures including sustainable energy work practice and capacity to perform required tasks to the standards described in the unit of competence. Findings are in agreement with the perception of Olunike (2011) izueke & Nzekwe (2013) who observed that graduate skills have steadily deteriorated especially technical skills. They further stated that in many cases, employers compensate for insufficient academic preparation by organizing remedial courses for new employees. Also, Akinyemi, Ofem & Omore (2010) show that Nigerian graduates largely, lack basic employability skills that are needed in the modern workplace.

Regarding the contribution of TVET institutions in preparing competent craftsmen for the construction industry as presented in Table 2, respondents believed that TVET institutions have not been doing enough in preparing craftsmen for the construction industry as majority disagreed with variables listed on contribution of TVET in preparing craftsmen among which include: Provide appropriate on-the-

The results in table 3 show that majority of respondents agreed with all the ten (10) items posed to determine strategies for improving skill acquisition of craftsmen in the construction industry, the items include: TVET curriculum should feature new teaching techniques that combine both theory and practical training; TVET institutions should take initiative and collaborate with business and industry in the areas of internships and curriculum development; TVET institutions should undertake relevant work assessments in accordance with industry and business requirements; TVET institutions should develop site safety plan which identifies all relevant site safety features in accordance with company requirements and TVET should update knowledge and skills to accommodate changes in skills, competence and operating procedures.

In order to determine the significant difference of competence level of craftsmen in the construction industry, an independent sample t-test was conducted to compare the mean scores of site manager/engineer in the construction industry and technical teachers. The independent sample t-test scores were presented in Table 4.

Table 4: t-test Results of Competence Level of Craftsmen in the Construction Industry N=107

| Competency | | X | SD | F | ρ |
|------------------------|---|-----|-----|-------|-------|
| Site manager/engineers | 9 | .64 | .50 | 0.258 | 0.797 |
| Technical Teachers | 8 | .57 | .61 | | |

As shown in Table 4, there were no statistically significant differences between site manager/engineer in the construction industry and technical teachers’ mean scores on the competence level of craftsmen in the construction industry. (t=0.258, ρ>0.5) In order words, majority of craftsmen in the construction industry are lacking in required skills.

In order to determine significant difference on strategies of improving skill acquisition of craftsmen in the construction industry, an independent sample t-test was conducted to

job training to fill identified skill gaps and improve work performance of craftsmen; developing an awareness of learning methods and options, such as training, shadowing others, coaching and mentoring; TVET provide relevant safety systems information to access analyze and use to assist in or confirm hazard identification and assistance in development and presentation of proposals for resource requirements in line with operational planning processes.

The findings are in line with the perception of Ogwo & Oranu (2006) who observed that all educational effort should aim at acquiring knowledge and skill-that can be recalled and transferred to new situations. Furthermore, Imandojemu (1999) observed that skill development will be effective if the trainee and trainers are able to participate fully in the process. This implies that students and teachers must have a clear idea of what they personally want to achieve by the time skill development is completed.

Suggesting the strategies for improving skill acquisition of craftsmen in the construction industry, it was found out in the study that if those strategies could be greatly implemented, the competence of craftsmen in the construction industry would be greatly improved. These strategies among others include: Professional development activities should be undertaken to update trainee understanding of current industry/work practices; TVET should update knowledge and skills to accommodate changes in skills, competence and operating procedures and TVET institutions should work in partnership with industry to ensure employment, employee training and their continuing education. Thus, the findings were in agreement with Awe (2008) who explained that educational experience can be enhanced through practical work assignments that expose the student to the work of the employer. This enhances the students' knowledge in the career field. It helps the students to recognize the operation and requirements of real-life business. Also, Ezeji (2001) and UNESCO and ILO (2002) stressed that it is necessary to ask about the appropriateness of the selected contents i.e. how suitable or relevant to the need of contents to craftsmen in the construction industry are the contents adequate or responsive to their needs?

The findings of the study revealed no significant different between site manager/engineer in the construction industry and technical teachers mean score competency level of craftsmen in the construction industry. This suggests that site manager/engineer in the construction industry and technical teachers have made the same observation regarding poor competency level of craftsmen in the construction industry. The study also found no statistically significant differences between the site manager/engineer in the construction industry and technical teacher mean score or strategies for improving skill acquisition of craftsmen in the construction industry. These results suggest that site manager/engineer in the construction industry and technical teachers held the same opinion regarding these strategies. The obvious implication of these findings is that those strategies for improving skill

VIII. CONCLUSION

It is obvious that skill development enhances employment and productivity as well as sustains competitiveness in the global economy. Skill development is the ability to do or perform an activity that is related to some meaningful action, work or job. To develop a particular skill is to show the habit of thinking, acting and behaving in a specific activity in such a way that the process becomes natural to an individual through constant practice. The less attention paid to practical skill in schools and over reliance on paper qualifications especially by the Nigerian Government (the largest employer of labour) has reduced the quest for skill acquisition. Theoretical knowledge alone would not usually prepare an educated person for the world of work. The worker or productive individual must not only be knowledgeable but must also be versatile in the application of skills to perform defined job or work. Based on the analysis presented in this paper, the paper draws its conclusion that craftsmen in the construction industry lack basic mental, social and practical skills that will help them to function effectively in the industry: TVET institutions have not been able to provide competent craftsmen for the construction industry. It has failed to offer students the required skills as needed in the world of work and has not been actively using feedback from site/workshop managers, subordinates and peers to improve craftsmen performance.

IX. RECOMMENDATIONS

We recommend partnership between the construction industry and technical institutions to develop skill development curriculum for TVET and provide lifelong skills training for craftsmen during their training. TVET should be adequately funded to ensure that resources required for skill acquisition is provided. Finally, paper qualification should not be taken above practical skills in government employment. This will make the students more interested in acquiring the required skills, for the world of work.

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