



Original Research Article

Rating of strategies for transforming technical vocational education and training for the 21st century by tertiary institution lecturers in South East Nigeria

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Nigeria like most nations of the world has embraced technical vocational education and training (TVET) as a veritable tool for technological transformation and sustainable development but the nation is yet to reap the benefits as unemployment and poverty levels are still high. The paper determined the rating of school-industry partnership and retraining of lecturers as strategies for transforming TVET in Nigeria for the 21st Century to address the perennial problems by 79 TVET lecturers from tertiary institutions in the south east zone. Two research questions and two null hypotheses were used for the study. A 5-point validated rating scale questionnaire with reliability coefficients of 0.72 and 0.80 for the two sections was used for data collection. Mean and standard deviation were used to analyze data in respect of the research questions while the analysis of variance (ANOVA) and z-test were used to test the hypotheses at 0.05 level of significance. Findings revealed that the two strategies were rated as effective strategies for transforming TVET in the 21st Century. The researcher concludes that the two strategies are suitable for addressing the problems besetting TVET and transform the programmes to adequately prepare the products for effective performance in the 21st Century. Consequently, she recommends among others that management of TVET institutions in Nigeria and other countries of the world should adopt and ensure effective implementation of the two strategies and that TVET lecturers and teachers at all levels of the education system should search for suitable retraining programmes to upgrade and update their technological competencies to remain relevant in the 21st Century.

Key words: Rating, strategy, transformation

INTRODUCTION

A very important role of education is the preservation and updating of knowledge and skills of students in line with changes in the society. Technical vocational education and training (TVET) is widely acknowledged as one of the veritable instruments for commercial and industrial mobilization in any society because it provides the basic training needed for industrial management and leadership. TVET is designed to equip individuals with practical manipulative and calculative skills, scientific knowledge and attitudes for self-reliance and industrialization. The

main focus of TVET is individual and national self-reliance and industrial development which ultimately enhance the standard of living in any society.

Drastic changes have occurred in the 21st Century workplace and business environment as a result of technological advancement and globalization. These changes pose enormous challenges to individual workers, business managers, organizations and nations and require a repositioning or transformation in education generally and TVET in particular to ensure that the skills acquired by

students are relevant in the 21st Century to enable them earn the desired prosperous and attractive lifestyle by contributing positively to the socio-economic and industrial development of their nations. Implementation of TVET in Nigeria is faced with several problems such as lack of digital competencies by lecturers, mismatch between content and labour market demands, lack of relevant training equipment and other facilities among others. Suitable strategies are needed to solve these problems and transform TVET in line with the mind blowing changes in the 21st Century workplace and business environment where the products will operate. It is this need that motivated this study to determine the rating of tertiary institutions TVET lecturers in south east Nigeria of school-industry partnership and retraining of lecturers as strategies for transforming the programmes in the 21st Century.

Statement of the problem

Yenkwo (2004) affirmed that TVET serves as a major ingredient for success in the efforts of government to alleviate poverty, eradicate corruption, attain food security and ensure drastic reduction in violent crimes and communal clashes involving unemployed youths most of the time. Nigeria embraced TVET in the school system right from the secondary to tertiary levels over 30 decades ago with huge government investments in training teachers in local and foreign institutions. In spite of these, the nation is still battling with high level of unemployment (even among graduates of TVET) with its associated poverty and crimes. Mamuda et al. (2014) reported that the impact of TVET on the development of human resources in Nigeria has not been adequately felt. This ugly situation is a paradox that makes the relevance of the program in the 21st Century doubtful. Consequently, the researcher is worried that Nigeria is not reaping the gains of TVET like other countries of the world and that the graduates may not fit into the workplace of the 21st Century unless efforts are made to transform the programmes. Different strategies like school-industry partnership, retraining of lecturers, curriculum revision, increased funding and provision of equipment among others are being employed for transforming education generally and TVET especially in line with societal changes. Two of these strategies, school-industry partnership and retraining of lecturers, appear to be more related to the 21st and form the fulcrum of this study. The extent to which each of these strategies is considered effective especially by tertiary institution TVET lecturers who have the responsibility of training the direct implementers of the programmes is not certain hence the imperativeness of this empirical study.

Objectives of the study

The purpose of this study was to determine the rating of strategies for transforming TVET for the 21st Century by tertiary institution lecturers in south east Nigeria.

Specifically, the study determined the rating of the tertiary institution lecturers on:

1. School-industry partnership as a strategy for transforming TVET for the 21st Century.
2. Retraining of lecturers as a strategy for transforming TVET for the 21st Century.

Significance of the study

Findings of this study would be of immense benefits to TVET students and lecturers, educational institutions, industry, government and the inhabitants of the area of the study as well as other zones in Nigeria and others countries of the world. The findings will provide direction on how to boost the capacity of TVET to equip students and lecturers with relevant 21st Century skills to contribute positively to the society and earn prosperous and attractive lifestyle. The findings will also go a long way in guiding the establishment of mutually beneficial relationships between schools and the industry as well as contribute to socio-economic and industrial development of the zone for the benefit of the citizens and governments. Other zones in Nigeria and other countries of the world could benefit from the findings by applying them to transform TVET in their areas relative to changes in the 21st Century.

Research questions

The following research questions guided the study:

1. What is the rating of tertiary institution lecturers on school-industry partnership as a strategy for transforming TVET for the 21st Century?
2. What is the rating of tertiary institution lecturers on retraining of lecturers as a strategy for transforming TVET for the 21st Century?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. Respondents do not differ significantly in their mean ratings on school-industry partnership as a strategy for transforming TVET for the 21st Century as a result of experience (0-5 years/6-10 years/11 years and above).
2. There is no significant difference in the mean ratings of respondents on retraining of lecturers as a strategy for transforming TVET for the 21st Century based on type of institution (University/College of Education (Technical)).

Review of Literature

Literature for this study was reviewed under concept, objectives and roles of TVET, problems of TVET implementation in Nigeria, the need to transform TVET for the 21st Century and strategies for transforming TVET for the 21st Century.

Concept, objectives and roles of TVET

TVET refers as those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, knowledge and understanding related to occupations in various sectors of the economic and social life. According to Okoye and Okwelle (2013) TVET is the form of education that emphasizes pragmatic attitude as a priority and advocates the development of the head (knowledge), training of hand (dexterity) and enrichment of the heart (consciousness and painstaking). The authors posited that TVET emphasizes the 3Hs (head, hand and heart) as a total deviation to the form of education that emphasizes the 3Rs (reading, writing and arithmetic) which serves as a credential for entry into elite status with the graduates roaming the streets in search of non-existing white collar jobs. Okoye and Okwelle (2013) further defined TVET as a diversified form of education that focuses on suitable manpower production relevant to the needs of the industry, society and the changing technological work environment.

Citing UNESCO, Maigida (2014) defined TVET as the form of education and training designed to inculcate practical skills, knowledge and understanding necessary for employment in particular occupations or trades. In the context of this study, TVET is an integration of the vocational and technical education programmes covering agricultural education, business education, home economics education and technical education offered in Universities and Colleges of Education in Nigeria for the preparation of individuals that will take up teaching in the field at the secondary and tertiary levels of the education system, be employed in the industry or become entrepreneurs. The programmes are generally located in the faculty or school of education and can be housed in the department of vocational education, vocational technical education or technology and vocational education in the two levels of tertiary institutions. Generally, the programmes focus on impartation of knowledge, development of relevant practical skills and attitudes needed by individuals to actively participate and contribute to the welfare of their communities at all times.

According to Maigaji and Bankole (2014), the 2001 UNESCO recommendations on TVET for sustainable development had the following three objectives:

1. To contribute to the achievement of the societal goals of greater democratization and social, cultural and economic development while at the same time developing the potential of all individuals both men and women for active participation in the establishment and implementation of the goals regardless of religion, race and age;

2. To lead to an understanding of the scientific and technological aspects of the contemporary civilization in such a way that people comprehend their environment and are capable of acting upon it while taking a critical view of

3. The social, political and environmental

implications of scientific and technological change and

4. To empower people to contribute to environmentally sound sustainable development through their occupations and other areas of life.

In line with the above, the Federal Government of Nigeria (FRN, 2004) outlined the objectives of TVET in the country as:

1. To acquire technical and vocational skills
2. To expose recipients to career awareness by exploring useable options in the world of work
3. To enable youths develop intelligent understanding of the complexity of technology
4. To stimulate creativity

On the roles of TVET, Owheh (2013) observed that TVET has prospects of poverty eradication, job creation, sustainable development and actualization of the transformation agenda of the Nigerian Federal Government. In support, Magaji and Bankole (2014) stated that TVET could play a pivotal role in the provision of skilled workforce needed for Nigeria's economic transformation. Adekunle et al. (2014) affirmed that TVET could nurture the necessary practical skills for agricultural, industrial, commercial and economic development and thus build a self-reliant nation. Furthermore, Uwaifo (2014) highlighted the roles TVET could play in the economic growth and development of Nigeria to include (1) conservation and development of natural resources, (2) prevention of waste of human labour, (3) increment in the wage of people and (4) reduction of unemployment

Uwaifo (2014) further posited that if effectively implemented, TVET programmes could contribute to improvements in the nation's agricultural development and food production while Maclean (2011) and Okolocha (2012) affirmed that TVET is a suitable instrument for curbing social exclusion (where cost of higher education is out of the reach of the majority) and an antidote for youth unemployment (where the labour market is saturated). TVET could stimulate economic growth and social development and improve conventional education, empowerment of youths and women, wealth creation, poverty reduction and skills enhancement.

The highlight of the foregoing is that TVET is a form of education that has immense benefits to individuals and nations and as such should be given the attention it deserves. For instance, in a nation like Nigeria with recurrent youth restiveness, TVET will help youths and adults become self-reliant, enhance the skills of industry workers and mitigate high employment turn-over and the risk of obsolescence. It will help government alleviate poverty, eradicate corruption, attain food security and significantly reduce violent crimes and communal clashes involving unemployed youths most of the time.

Problems of TVET implementation in Nigeria

TVET became popularly supported in Nigerian institutions over three decades ago with laudable objectives and huge

investments of the government in training teachers and lecturers but the programmes are not yielding as much benefits to individuals and the nation as reported in other nations. Factors such as curriculum relevance, equipment supply and lecturers' quantity and quality have been highlighted in research as contributing to the ugly situation since the 1990s to the present (Oyedele, 1992; Olaitan, 1996; Azuka, 2003; Osuala (2004); Omekwe, 2009; Uwaifo and Uwaifo, 2009, Okeke and Eze, 2010; Ofoha, 2011; Ezenwafor et al., 2014). Maigida (2014) outlined challenges of TVET programmes in Nigeria to include mismatch between curriculum content and labour market, schools not having the capacity to deliver training required by the industry, inadequate training equipment, infrastructure and facilities and lack of relevant competencies by lecturers/facilitators.

Efforts of government, school management, TVET lecturers and their professional association seem to only scratch at the problems which are compounded by drastic changes occurring in the 21st Century workplace and business environment. Organizations strategize to have a unifying theme that gives direction to the actions of different individuals and groups towards successful programme implementation and project execution. Therefore, apart from the need to strategize to solve the problems negating TVET implementation in Nigeria, it becomes also imperative to formulate suitable strategies that will transform the programmes as recommended by UNESCO (2004) to ensure continued relevance in the 21st Century. Strategies that could remarkably transform TVET for the 21st Century are school-industry partnership and retraining of lecturers as they would significantly address the besetting problems highlighted above and the challenges of the century.

The need to transform TVET for the 21st century

Ezenwafor and Okoli (2014) affirmed that a very important role of education is the preservation and updating of knowledge and skills of students in line with changes in the society. The authors observed that drastic changes in the 21st Century are the result of information and communication technologies which have reduced the world to a global village of interconnected and interrelated communities. This is in line with the position of Osuala (2002), Bernstein (2005), Partnership for the 21st Century Skills (2007) and Peter (2010) that technology and globalization are the key factors responsible for the dramatic changes in the 21st Century. Supporting, Maigida (2014) observed that the 21st Century is knowledge based and information and technology driven. Bernstein specifically posited that globalization as a result of technology has enabled different sizes of companies to transact business with customers all over the world causing the economy to become far more integrated than ever before. The century is a new economy that is powered by technology, fuelled by information and driven by knowledge leaving people with opportunities in their

hands.

Drucker (2009) summarized changes in the 21st Century to include redefinition and reorganization of jobs and relevant skills for performance based on the impact of technology and increased global competition affecting types of work and how they are done. Others are employees demand for greater flexibility, redefinition of values and shifting customer demands, human resource policy and programme responding to global business structures and recognition of global leadership among others. These changes pose great challenges to workers, organizations and nations such as being adequately knowledgeable, skilled and flexible to compete in the global arena, enterprise mobility and closer collaboration between business, education and government to remain relevant and increase the inter-connection between the needs of industry, higher education and government (Drucker, 2009).

Changes in the Century demand that workers possess new sets of skills and competencies than those they succeeded with in the past. Jobs in the 21st Century require the use of hi-tech equipment as the society depends on the ability of individuals to communicate, negotiate, compete and collaborate both locally and globally. In view of this, Ogwo (2005) observed that the realities of globalization and technological advancement call for schools to turn out skilled workers who can acquire, apply and transfer their knowledge to varying technological conditions and societal changes.

School-industry partnership as a strategy for transforming TVET for the 21st century

Ojimba (2013) emphasized the need for school and industry to partner in science education to reform the programme and help students acquire skills and suitable work habits for the 21st Century. Maigida (2014) used the term public private partnership as a relationship formed between the public and private sectors to introduce private sector resources and expertise to deliver public services. In the context of this study, school-industry partnership is a mutually beneficial relationship between TVET institutions and relevant industries where the students will serve on graduation. Maigida affirmed that this relationship is the only means to make TVET meaningful and successful in Nigeria because the government cannot bear the high cost of providing equipment and infrastructure for TVET programmes and industry involvement will greatly enhance government provision. Furthermore, Maigida asserted that a well articulated partnership strategy covering curriculum development/reviews, student industrial attachment, training and retraining of lecturers and replication of equipment used in industries in training institutions will solve the problems that are negating the success of TVET in Nigeria and transform the programmes for the 21st Century.

Amu and Offei-Ansah (2011) highlighted the need for vocational and technical education (VOTEC) department of the University of Cape Coast to link students to industries

as a requirement for the curricula to prepare students to adequately fit into the world of work. Muchemi et al. (2013) observed that teaching staff industrial attachment was a novel idea in Kenya which helped relate teaching and learning processes to the latest development in technology and systems as well as improve staff and students' competence among others. Supporting, Triki (2013) affirmed that TVET partnership with industry is essential for curriculum development, access to modern equipment, more effective supervision of programme implementation, improved skills acquisition by students and enhanced competency of staff. The author posited that school-industry partnership is one of the strategies to achieve the objectives of TVET at all times. The present researcher outlined 18 components gleaned from literature for school-industry partnership as a strategy for transforming TVET for the 21st Century to be rated by the lecturers.

Retraining of lecturers as a strategy for transforming tvet for the 21st century

In Nigeria, TVET lecturers are trained in colleges of education and universities. The quality of training and products of these programmes, as posited by Ezenwafor and Okoli (2014), depend largely on the quality of their trainers and available equipment. Emezi in Ezenwafor and Okeke (2006) observed that one of the major educational problems of Nigeria is the training of competent teachers. TVET programmes involve practical training in laboratories and workshops which require use of equipment, machines, tools and other facilities. Ogwo (2005) observed that the realities of globalization and technological advancement call for turning out skilled workers who can acquire, apply and transfer their knowledge to varying technological conditions. Odu (2011) lamented that some TVET lecturers were either trained with obsolete equipment or have worked with such equipment for a long time that their skills need to be updated through retraining programs. Consequently, Ezenwafor and Okeke (2006) recommended that, in addition to continuous review of the pre-service programmes of TVET lecturers, they should be motivated and encouraged to enroll for retraining to upgrade and update their knowledge and competencies in order to remain relevant in the changing society. They recommended further that the lecturers should be suitably mentored by experienced practitioners and provided with opportunities for institutional and international linkages.

Retraining of TVET lecturers could be achieved through conferences, seminars, field trips and other forms of in-service programmes locally and in foreign institutions. Netherlands International Cooperation in Higher Education (NICHE, 2010) posited that TVET lecturers should have direct contact with the labour market through short term periodic secondments that would modernize and upgrade their practical knowledge on the actual technologies being employed in the workplace and gain insight into the actual practical needs of the labour market. Also Swarts et al. (2011) affirmed that empowerment of lecturers and

instructors to transfer relevant skills and knowledge to students that respond to industry demands and efficient ICT deployment is fundamental in transforming TVET in the 21st Century. The authors emphasized the need to develop ICT competency frameworks and methodologies for lecturers' training to enable them acquire the competencies and affirmed that modernizing the curriculum and integrating ICT as a core subject in TVET programmes will make them more relevant in the 21st Century.

Ezenwafor (2013), Ezenwafor et al. (2014) and Ezenwafor and Okoli (2014) posited that in order to bridge the gap between quantity and quality of lecturers for effective implementation of TVET programmes in Nigeria for the 21st Century, their training and retraining should be a focal area. The present researcher has formulated 18 components under retraining of TVET lecturers as a strategy for transforming TVET for the 21st Century to be rated by the lecturers.

METHOD

Survey research design was adopted for the study and the area was south east Nigeria. 79 TVET lecturers were sampled from universities and colleges of education (technical) in the area. A researcher developed questionnaire which was validated by two TVET experts and has reliability coefficients of 0.70 and 0.80 established by distributing the instrument to eight TVET lecturers drawn from outside the area of study and analyzing the data collected with the Cronbach alfa was used for data collection. The questionnaire had 38 items in three sections; A, B and C. Section A has two items on respondent's personal data while B and C have 18 items each and five response options of highly effective (HE) = 5 points, effective (E) = 4 points, moderately effective (ME) = 3 points, ineffective (IN) = 2 points and highly ineffective (HIN) = 1 point arranged in two clusters according to the research questions. The researcher personally administered the instrument to the respondents in their institutions with the help of three of her colleagues whom she selected as research assistants. The arithmetic mean and standard deviation were used to analyze data in order to answer the research questions and determine the homogeneity or otherwise of the respondents' mean ratings while analysis of variance (ANOVA) and z-test were used to test the hypotheses at 0.50 level of significance. Decision on the items in sections B and C of the instrument was based on the real limits of numbers and a hypothesis was upheld where the f-ratio was equal to or greater than the p-value or the z-calculated is less than the p-value at 0.05 level of significance otherwise the hypothesis was rejected.

RESULTS

Data collected from the study were analyzed to answer the research questions and test the hypotheses and results

Table 1. Respondents' mean ratings and standard deviation on school-industry partnership as a strategy for Transforming TVET in the 21st Century

S/N	Components of school-industry partnership strategy	Mean	SD	Decision
1.	Adopting team teaching by lecturers and industry experts	4.48	0.66	E
2.	Taking students to relevant industry for practical sessions	4.72	0.50	HE
3.	Extending students' industrial work experience beyond one semester	4.27	0.84	E
4.	Forming occupational committees with lecturers and industry experts	4.38	0.77	E
5.	Inviting industry experts to address students during orientation	4.49	0.71	E
6.	Developing course contents jointly by lecturers and industry experts	4.54	0.66	HE
7.	Involving industry experts in curriculum development/review	4.43	0.57	E
8.	Hiring industry equipment for practical sessions	4.29	0.86	E
9.	Involving industry specialists in program supervision	4.13	0.82	E
10.	Involving industry specialists in lecturer selection	3.92	0.93	E
11.	Relevant industries sponsoring employees for in-service training in TVET institutions	4.34	0.75	E
12.	Involving industry in accreditation of TVET programs	4.33	0.78	E
13.	Matching TVET programs with the labour market	4.42	0.76	E
14.	Getting industry donate equipment for TVET	4.61	0.63	HE
15.	Industry to build and donate infrastructural facilities for TVET	4.54	0.73	HE
16.	Industry readily absorbing TVET graduates	4.32	0.81	E
17.	TVET Lecturers presenting case studies to studies from relevant industries	4.23	0.72	E
18.	Lecturers periodically taking students to relevant industrial cites	4.48	0.62	E
Grand mean (mean of means)		4.14		E

Table 2. Respondents' mean ratings and standard deviations on retraining of lecturers as a strategy for transforming TVET for the 21st Century

S/N	Items on lecturer retraining strategy	Mean	SD	Decision
1.	Periodically inviting IT specialists to acquaint lecturers with new technologies	4.66	0.57	HE
2.	Sponsoring lecturers to conferences of relevant industries	4.74	0.47	HE
3.	Sponsoring lecturers to short courses on new trends	4.61	0.56	HE
4.	Periodically sponsoring lecturers to practical workshop sessions in relevant industries	4.72	0.55	HE
5.	Hiring industry specialists to coach lecturers on new trends	4.46	0.84	E
6.	Establishing regular interactive sessions by lecturers and industry specialists	4.44	0.66	E
7.	Institutions establishing short term refresher courses for lecturers	4.35	0.73	E
8.	Sponsoring lecturers to professional conferences for new knowledge acquisition	4.56	0.52	HE
9.	Motivating experienced lecturers to mentor fresh ones on effective practices	4.48	0.62	E
10.	Motivating fresh TVET graduates with digital competencies to groom serving lecturers	4.27	0.78	E
11.	Mandating lecturers to participate in refresher courses on their own to update and upgrade their knowledge and skills	4.24	0.80	E
12.	Sponsoring lecturers for higher qualifications locally	4.41	0.74	E
13.	Sponsoring lecturers for higher qualifications in foreign institutions	4.52	0.71	HE
14.	Making it mandatory for lecturers to acquire higher qualifications for promotion	4.18	0.73	E
15.	Making it mandatory for lecturers to acquire professional experience in industry in addition to academic training	4.23	0.72	E
16.	Sending lecturers to industries periodically to upgrade and modernize their practical knowledge on workplace technologies	4.38	0.61	E
17.	Mandating lecturers to upgrade their digital competencies	4.29	0.75	E
18.	Periodically sending lecturers to relevant industries to gain insight into the actual needs of the labour market	4.29	0.70	E
Grand mean (mean of means)		4.44		E

were presented in Tables 1, 2, 3 and 4 as follows:

Data in Table 1 show that the means for four items fell within 4.50 and above while the rest were between 3.92 and 4.49 which indicates that four items were rated as highly effective and 14 items rated as effective. The grand mean of 4.14 indicates that school-industry partnership was rated as an effective strategy for transforming TVET for

the 21st Century. The standard deviations for all the items are within the same range showing that the respondents were homogeneous in their opinions.

Data in Table 2 show that the mean ratings for six items was 4.52 while those of 12 items ranged between 4.18 and 4.48 which means that six of the items were rated as highly effective and 12 as effective. The grand mean of 4.44

Table 3. ANOVA summary of respondents' mean ratings of school-industry partnership as a strategy for transforming TVET for the 21st Century based on experience

	Sum of Squares	Df	Mean Square	F	P-value	Remarks
Between groups	.489	3	.245	1.15	0.32	NS
Within groups	16.157	76	.213			
Total	16.646	79				

indicates that the respondents rated retraining of lecturers as an effective strategy for transforming TVET in the 21st Century. The standard deviations for all the items are within the same range indicating that the respondents were homogeneous in their opinions.

The data in Table 3 show that the respondents did not differ significantly in their mean ratings of school-industry partnership as a strategy for transforming TVET for the 21st Century as a result of experience as the calculated F-value of 1.15 is greater than the P-value of 0.32 at 0.05 level of significance. Therefore the null hypothesis was upheld.

Data in Table 4 show that the calculated z-value of -3.63 is greater than the P-value of 0.001 at the alpha level of 0.05. This means that differed significantly in their mean ratings of retraining of lecturers as a strategy for transforming TVET for the 21st Century as a result of type of institution. Therefore, the null hypothesis was rejected.

Summary of major findings

Major findings of the study are summarized as follows:

1. TVET lecturers in south east Nigeria rated school-industry partnership effective as a strategy for transforming TVET for the 21st Century.
2. TVET lecturers in south east Nigeria rated retraining of lecturers effective as a strategy for transforming TVET for the 21st Century.
3. Years of teaching experience did not significantly influence the respondents' rating on school-industry partnership as a strategy for transforming TVET for the 21st Century.
4. Significant difference was found between the rating of respondents from universities and those from colleges of education on retraining of lecturers as a strategy for transforming TVET for the 21st Century.

DISCUSSION

Findings of the study in respect of school-industry partnership revealed that each of the 18 components and the strategy was rated effective in transforming TVET for the 21st Century. The finding agreed with the views of Bernstein (2005), Partnership for the 21st Century Skills (2007), Ojimba (2013), Triki (2013), Ezenwafor and Okoli (2014) and Maigida (2014) who affirmed that a well articulated school-industry partnership strategy will solve

the problems besetting TVET in Nigeria and equip the products for effective performance in the 21st Century workplace. The finding also agreed with Muchemi et al. (2013) who reported that the implementation of the strategy in Kenya helped relate teaching processes to the latest development in technology and improve the competence of staff and students.

Findings of the study also showed that each of the 18 components of lecturer retraining and the strategy was rated effective for transforming TVET for the 21st Century. Again the finding agreed with Ogwo (2005), Ezenwafor and Okeke (2006) and Odu (2011) who stressed the need to retrain TVET lecturers to update their technological competencies because some of them were trained with obsolete equipment. It also agreed with NICHE (2010), Swarts et al. (2011), Ezenwafor (2013), Ezenwafor et al. (2014) and Ezenwafor and Okoli (2014) who posited that TVET lecturers need to have direct contact with the labour market through short term periodic secondments to modernize and upgrade their practical knowledge on the actual technologies in the workplace as well as gain insight into the actual needs of the labour market.

This paper is significant in the composition of the items under the two strategies such as involving industry specialists in programme supervision and lecturer selection, experienced lecturers mentoring new employees and fresh graduates grooming serving lecturers on digital competencies and sending lecturers to relevant industries to be acquainted on the actual needs of the industry among others which earlier researchers did not cover. These new items are very important as they relate to the 21st Century trends.

CONCLUSION

The paper highlighted the value of TVET as a programme of study that advocates the development of the head, training of the hand and enrichment of the heart (3Hs) to help recipients secure or create employment for themselves and others as against the type of education that emphasizes reading, writing and arithmetic (3Rs) that makes the recipients roam the streets in search of white collar jobs. TVET has the potential to create jobs, reduce unemployment, eradicate poverty and its ills in any society, conserve and develop natural resources, prevent wastage of human labour and increase peoples' wages. It is an

Table 4. Z-test analysis of respondents' mean ratings of retraining of lecturers as a strategy for transforming TVET for the 21st Century based on institution.

Institution	N	Mean	SD	z-calc	P-value	∞	Remarks
University	34	4.26	0.38	-3.63	0.001	0.05	S
College of Education	45	4.57	0.38				
Total	79						

instrument for curbing social exclusion, stimulating industrial and economic growth, social development and youth and women empowerment as well as individual and national self-reliance, enhancing skills of industry workers and mitigating the risk of obsolesce. The paper highlighted the mind-blowing changes that have occurred in the 21st Century as a result developments in technology and globalization which require that individuals possess new sets of skills than those they succeeded with in the past.

The realities of these changes call for schools to turn out skilled workers who can acquire, apply and transfer their knowledge to varying technological conditions and societal changes. Consequently, literature reviewed was replete with calls for transforming TVET for the 21st Century to enable the products acquire relevant competencies to compete effectively locally and globally. Organizations strategize to have a unifying theme that gives direction to the actions of different individuals and groups towards successful programme implementation and project execution. Therefore, it is imperative that governments, management of TVET institutions, TVET lecturers and teachers at different levels of the education system should formulate suitable strategies to successfully and remarkably transform TVET programmes for the 21st Century. The strategies of school-industry partnership and retraining of lecturers were widely supported by authors from different countries such as Nigeria, Ghana and Kenya among others cited in the study. In addition, all the 18 components of each were rated effective for transforming TVET for the 21st Century by the tertiary institution lecturers involved in the study. Therefore, the author concludes that each of the 18 components and the two strategies are suitable for transforming TVET for the Century at all levels of the education system in all countries of the world.

RECOMMENDATIONS

Based on the findings and conclusion of this study, the researcher recommends that:

1. Management of TVET institutions in Nigeria and other countries of the world should strategize to transform TVET for the 21st Century to keep the programmes and products relevant in the globalized and technologically driven workplace and business environment.

2. Management of TVET institutions and lecturers in

different parts of the world should adopt and effectively implement well articulated school-industry partnership strategy to ensure that the actual needs of industry are addressed and the actual technologies used in industries in the 21st Century are used for training.

3. Management of TVET institutions and lecturers in different parts of the world should adopt and actively engage in well articulated strategy for retraining lecturers to ensure that they possess relevant 21st Century competencies at mastery levels to be able to transfer them to students.

4. TVET lecturers and teachers at all levels of the education system in Nigeria and other parts of the world should search for suitable retraining programmes to upgrade and update their technological competencies in order to remain relevant in the 21st Century..

5. TVET curriculum planners should adequately provide for partnership between school and industry in the programmes both for students and lecturers to ensure that the training covers actual needs of the industry.

6. Government at all times should formulate and ensure effective implementation of policies for TVET programmes in Nigeria and other parts of the world to achieve sustainable development.

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