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## **TVET AND INDUSTRY: REVAMPED TVET CURRICULUM AS THE MISSING LINK FOR SUSTAINABLE ECONOMIC GROWTH AND DEVELOPMENT IN NIGERIA**

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**ABSTRACT:** *Technical and vocational education and training (TVET) aside from providing general education is established for training and practical skill development opportunities that attunes to national and local contexts. TVET graduates should be competent enough to apply scientific knowledge to improve and solve environmental problems. However, graduates from various TVET programmes have failed to justify this purpose. This paper explored the present curriculum using the Department of Computer Science, The Federal Polytechnic, Ilaro curriculum as a case study to identify this missing link. Descriptive and Inferential Statistical analysis carried out on some graduates of the Department explicitly working in Information Technology (IT) firms as Developers to identify whether the knowledge and skills acquired in school were sufficient for their career take off, revealed a wide gap between the present curriculum and the trends in the industry. The results obtained from the study showed that 62% passed through further skill acquisition training that created employment opportunities for them, 14% trained before admission for the TVET programme while 24% were able to learn on the job. The empirical analysis also showed that the position of the participants did not differ significantly in their mean perception of TVET programs as evidenced by the F statistic of 1.690 with an associated P-value of  $0.195 > 0.05$  significance level.*

**KEYWORDS:** education, vocational, technology, curriculum development, industry, skill

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### **INTRODUCTION**

Education is the bedrock of any national development. It is a vital tool for both human and economic development (Orji & Job, 2013). Technical and Vocational Education and Training (TVET) is a tool for empowerment, for sustainable livelihood and social-economic development (Yusuff & Soyemi, 2015). The United Nations Educational Scientific and Cultural Organization (UNESCO) defined TVET as those aspects of educational process involving the addition to 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 (UNESCO, 2014; UNESCO, 2017). TVET according to Abdulraharam (2013) and Opatola *et al.* (2016) is a planned programme of courses and learning experiences that begins with an exploration of career options, supports basic academic and required skills for industry-defined work to transform Nigeria into a producer/manufactures nation from its present status of a consumer and importer nation.

Formal education has failed particularly in Nigeria. The need for a total review and overhauling of the curriculum at all levels of education and specifically the TVET where the focus is on producing technical

capacities and tailor towards the need of the industry for national development. Otherwise, the country may not be able to achieve the 21<sup>st</sup>-century educational skill and standard required to address local challenges. To achieve this goal, there is no doubt that teachers involved in TVET must be retooled with the skill and knowledge required to attain a global standard and produce relevant products. Therefore, the industry-based curriculum should be adopted at all levels so as achieve global competitiveness (Okoye & Arimonu, 2016).

The case study here is the Department of Computer Science of the Federal Polytechnic, Ilaro which is one of the fastest-growing and dynamic fields all over the world. This field requires that the curriculum is reviewed from time to time to keep pace with the current trend in the field and the industry. The use of the 2004 and 2007 curriculum in the year 2018 is proof of this laxity in our TVET tertiary institutions. There is a need for the government to leverage Information Technology (IT) and other field innovation as a viable means of achieving sustainable economic development.

The National Board of Technical Education (NBTE) is the regulatory body for technical and vocational institutions studies in Nigeria. The body is responsible for putting together the curriculum run by TVET. They also ensure compliance with its use at all levels. The body mandates all institutions under its jurisdiction to use contents only in the available curriculum of the year 2004 and the year 2007. A curriculum that is more than a decade (10 years) old in a fast-growing technologically and advancing society. Particularly in the Information Technology (IT) Computer science field that is so dynamic.

The Department of Computer Science here is being used as a case study. The expectation naturally from this discipline is to develop and produce programmers that are well-grounded and can write codes to solve problems both locally and globally. Unfortunately, the curriculum build-up does not give room for this because more of the courses in the curriculum have no bearing with programming. The National Diploma (ND) 1 first semester contains only 1 programming course out of 9 courses (Introduction to programming). The second semester with only 1 programming course out of 7 courses

(Scientific programming using OOJAVA). For ND 2 first semester, there are 2 programming courses out of 9 courses (Computer programming using OOBASIC and Commercial Programming language using OOCOBOL). For ND 2 second semester, 2 out of 8 courses are programming courses (Computer programming using OO FORTRAN and Web Technology) (NBTE ND Curriculum, 2004).

Also, for Higher National Diploma (HND) curriculum, first semester HND 1 has 1 programming course as Computer programming using C++ out of 7 courses. The second semester of the same class has 1 programming course also (Assembly language) out of 7 courses. At HND 2, first semester, Computer Programming using OOPASCAL is the only programming course out of 6 courses, and for the second semester of the same class, no programming course at all (NBTE HND Curriculum, 2004).

The problem here is that a clear-cut demarcation has not been made between the University curriculum and that of TVET. The TVET programme is established primarily to teach proficiency of skill in individual discipline and graduates from this end should be sound enough to stand on their own. This essence of

establishing TVET should be revisited and the Curriculum should be revamped to reflect this (Uwaifo, 2009; Yang, 2008).

## MATERIALS AND METHODS

### Proposed Model

The curriculum proposed in this study (figure 1) is such that 75% of courses per semester for each discipline should be the core courses that are required to be skilled and proficient. 25% will be spread across the other relevant courses that could assist the core courses. Using the case study as an example, out of 8 courses, 6 should be programming courses, while the remaining 2 courses should be spread across other relevant courses to the core courses. For the core courses, thorough, regular, and up-to-date practical should be implemented by allocating enough practical hours. Also, the skill acquired during the period should be benchmarked against the skill required in the industry by carrying out collaborative projects with them. Finally, the real-life project should be implemented per time to test the impact of knowledge acquired on the student. Teachers are not left out in this process; they should be trained from time to time to keep pace with current technology and happenings in their field that will be impacted on the students also. Figure 1 below is the proposed model in a pictorial form

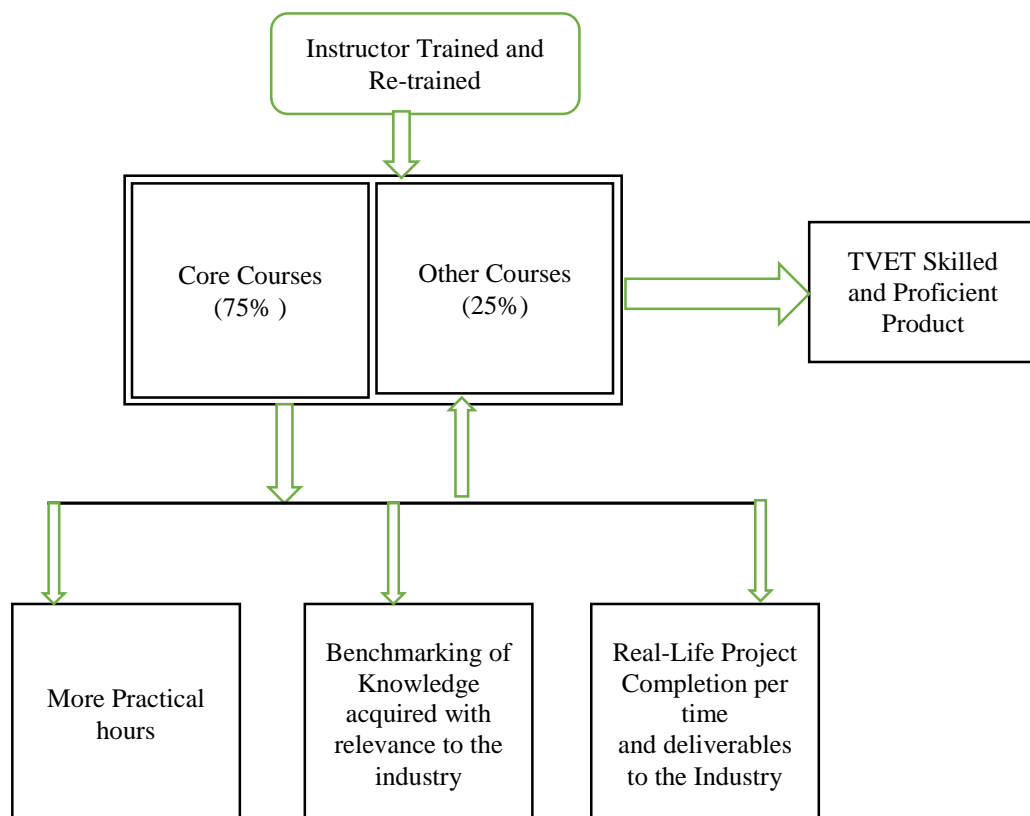


Figure 1. The Proposed Model for Industry-need based Curriculum

## Data Collection

The survey method was adopted in carrying out this study. This method was considered appropriate because it is best for the studies of non-observable events such as opinions, attitudes preferences, or dispositions. A sample of 50 past students of the Department of Computer Science working in the Information Technology firms as developers were randomly selected in their various firms to identify whether the skills and knowledge acquired were sufficient for their career take-off including their general perception on TVET programmes. The form of the questionnaire used provided an easy and quick way of collecting objective information from primary sources without necessarily allowing the respondents to strain his or her brain for answers. The prepared questionnaires were sent through emails to the various participants and responses were obtained and collated after a week of administering the same. Descriptive and Inferential method of data analysis was applied to scale statements and examine the order of importance using frequency and percentage table and pictorial representation. The analysis was done using Statistical Package for Social Sciences (SPSS) Version 20 (IBM Inc.).

## RESULT AND DISCUSSION

Figure 2 is a graphical representation of the frequency and percentage analysis of participants' demographic information according to gender. The analysis shows that 64% of the participants are male while 36% of them are female indicating that the majority of the sampled past students are male. Also, based on the participant's age distribution, it is obvious that the majority of them are between the ages of 31-37 (38%) years old as depicted in figure 3.

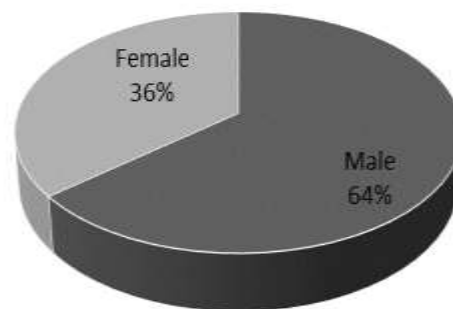


Figure 2. Gender Distribution of Participants

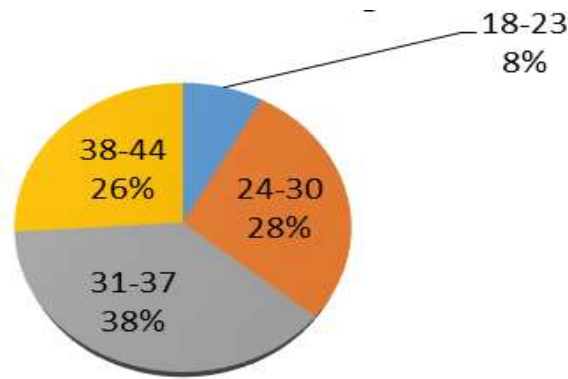


Figure 3. Age Distribution of Participants

For the years of experience, figure 4 shows that about 34% of the participants have below 3 years of experience, 42% have been in the IT firm between 3-6 years, while 24% of them have spent between 7-9 years in their respective firms. The analysis revealed that the majority of them have between 3-6 years' work experience.

The analysis of participants distribution to a position in their respective organization as depicted in figure 5 showed that the majority of them are the senior staff which contributes to about 56% of the total sample, 20% are junior staff while 24% are management staff respectively.

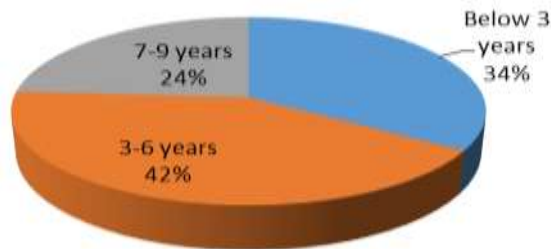


Figure 4. Distribution of Participants Years of Working Experience

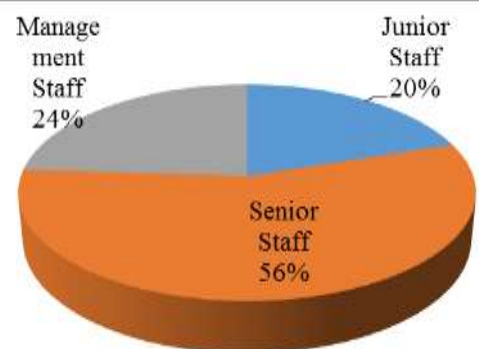


Figure 5. Distribution of Participants Position

Table 1 depicts the participants' perception of the Development of Industry needs-based curriculum in TVET Programmes. Analysis of item 1 indicates that TVET programmes contribute to the skilled workforces of the country for national development as opined by the majority (84%) of the total participants that strongly agree and also agreed. Taking item 2 into consideration, participants disagreed (80%) that the TVET curriculum equipped them with everything needed for their present work becoming an economically active citizen as a former student of TVET. The result from item 2 indicates that the TVET curriculum is not a viable tool to be economically active in this modern dispensation.

The analysis also indicates from item 3 that the present TVET curriculum used for training the students does not contain what is needed to handle specific jobs requirements through the relevant knowledge and skills that enhanced employability as opined by 84% of the total participants but there are specific skills acquisition training that must be acquired to fit into the labour market demand before a TVET student can be relevant in his field as evidenced in item 4 by all the respondents. Meanwhile, responses gotten from item 5 vary from participants to participants. 24% disagree that "going through further skill acquisition training after using present TVET curriculum for training is required for employment opportunities to complement what obtains in the fast-growing IT world" while 76% of the total participants agreed on the analyzed item.

On whether a robust and new TVET curriculum that captures the industry needs will be required to have TVET products employable without further training, 82% of the participants agreed to the raised opinion while 14% do not, as evidenced in item 6.

**Table 1:** Frequency and Percentage Analysis of Participants Perception to TVET

Item Nos.	Variables	Participants' Response Level				
		SD	D	U	A	SA
1	TVET programmes contribute to the skilled workforces of the country for national development	2 (4.0)	2 (4.0)	4 (8.0)	20 (40.0)	22 (44.0)
2	TVET curriculum equipped me with everything needed for the world of work and become an economically active citizen as a former student of TVET	20 (40.0)	20 (40.0)	- (-)	6 (12.0)	4 (8.0)
3	The present TVET curriculum used in training entails what is required to handle specific jobs through the relevant knowledge and skills that enhanced employability.	21 (42.0)	21 (42.0)	1 (2.0)	5 (10.0)	2 (4.0)
4	There is specific skills acquisition training that must be acquired to fit into the labour market demand and be relevant.	- (-)	- (-)	- (-)	15 (30.0)	35 (70.0)
5	Going through further skill acquisition training after using the present TVET curriculum for training is required for employment opportunities to complement what obtains in the fast-growing IT world.	7 (14.0)	5 (10.0)	- (-)	21 (42.0)	17 (34.0)
6	A robust and new TVET curriculum that captures the industry needs will be required to have TVET products employable without further training	4 (8.0)	3 (6.0)	- (-)	18 (36.0)	23 (46.0)

Data Presented as number (%) of Respondents. The perception was assessed by giving 1 to Strongly Disagree, 2 to Disagree, 3 to Undecided, 4 to Agree, and 5 to Strongly Agree. Reversed Questions were coded otherwise

It can also be seen in figure 6 below that before the participants could be actively integrated into the labour market demand, 62% of them had to pass through further skills acquisition programmes, 14% were trained by their employer while 24% learn on the job.

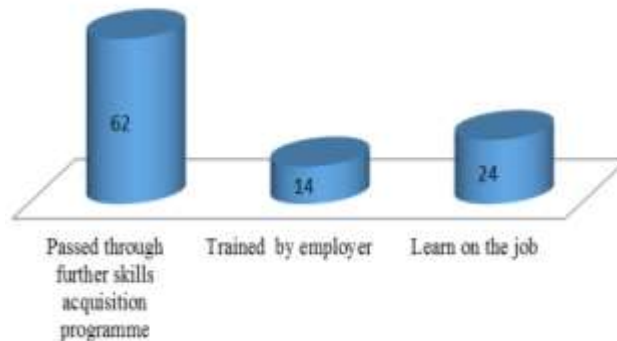


Figure 6: Distribution of Participants Perception to Employment

Analysis of variance in Table 2 depicts the significant difference between participants' mean response perception to TVET programmes and their position in the IT firm. Inferential statistics revealed that the mean response of participants position in their respective IT firms does not significantly differ in their perception of TVET programmes with  $F = 1.690$  and  $\text{Sig. } 0.195 > 0.05$ .

**Table 2:** Analysis of Variance

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	24.663	2	12.331	1.690	0.195
Within Groups	342.857	47	7.295		
Total	367.520	49			

Dependent Variable = Total Response

Factor = Position in the Organization

## CONCLUSION

The analysis from this study supports the fact that the current curriculum being used in TVET educational institutions are insufficient to equip the products of TVET for the demands in the industry as there are missing links that needed to be filled up. The curriculum needs revamping with contents enriched with practical that meets industrial needs. The National Board of Technical Education alongside professional bodies in different fields must take up this responsibility and ensure the review is done from time to time if the nation intends to



have sustainable economic growth and development. Also, the government should put in place strategies that protect TVET products from being treated inferior to their university counterpart so that they can comfortably use the practical skill and training acquired to the advantage of the nation for speedy technological development

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