TVET INNOVATIONS PRACTICES AND TVET TERTIARY INSTITUTION OUTCOME & PERFORMANCE IN OGUN STATE (A CASE OF THE FEDERAL POLYTECHNIC, ILARO)

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Abstract
This research assessed TVET innovation practices on Tertiary Institution in Ogun State using the Federal Polytechnic, Ilaro as study area. The variables employed were Strategy & Management; Teachings & Learning and Ecosystem Management as specific objectives while outcomes and performance are dependent variables employed which shows the results and achievement recorded amidst crisis such as Covid-19 pandemic. The research employed 222 respondents as sample size using Glenn D. Isreal model of sampling determination and data were analyzed using correlation and regression. The result obtained was p-value 0.000 at 5% significant level. It was found that all variables had positive and significant results except Ecosystem management. It was concluded that Federal Polytechnic, Ilaro should continue with all strategy TVET innovation practices employed in the past and increase it relationships on ecosystem management. It was recommended that continue to engage at social innovative practices and introduce practical apprenticeship system to it student to increase more employability in the labour market.
Keywords: Apprenticeship, **Tertiary-Institution, TVET-Innovation, Social, Practices, Employment**

Introduction

The market of labour in developed country and the world over is in transitory era with great impact on general-education of four walls and designed programs to increase talented student. In the same vein, 40% of job owner believe that new graduates of the colleges are ill prepared for the job future workforce because many do not learned advanced technology and so called soft skill necessary for the work in distant time (Renzulli, 2020). The fourth industrial economy has created a lot of disruptions of various kinds on our new graduates as well as teacher and institutions to develop a curriculum and learning that make the graduate employable of the society in the 21st century. All these affect TVET innovations in their activities to provide adequate manpower needs for world of work, hence, TVET innovation practice. TVET innovations practice is a systematic process through which institutions are required to develop transversal and technical skills for innovations within their local areas and which make TVET institutions relevant to needs of the economy, society and environment (UNEVOC,2020). Though, TVET innovation is an integral part of educational system which could stand as backbone of the nation and its economy. TVET sensitivity to market dynamics as a means of creating employment and solving societal problems. It is a problem for TVET innovation institutions with changing environment to maintain with ever dynamics hostile environment in the world over. Kazaure (2021) TVET of the 21st century should therefore provide skillful workers with persisted widened skills majorly to sustain the new organization requirements with attendant productive needs. Badawi and Dragoicea (2023) asserts that the labour market is almost always changing, as a result of technological and TVET innovation evolution, lifelong learning promises to cushion the unemployment rate and increase boom of the society through ICT innovative TVET training modules. TVET is expensive aspect of educational system, highly capital intensive. Hence, TVET innovation scheme is expensive in its sustainability. Managers of TVET institution do not have incentive and authority to innovate in sustaining their performance, hence output are not related to resources (ADB, 2008). TVET is the highest educational outfit difficult to manage, as a result of complexity in size and degree, sponsorships, client diversity, varied level of delivery and present dynamic job market needs (ADB, 2014). Innovation is construed as a solution to diverse economic, environmental and social problems with emphasis on skill needs in the market (Obe, et al,(nd). Innovative practice is a latent way to TVET practice, intra-institution to make TVET more targeted to society, economy, and environment needs. It entails the balance scorecards and dimensions proxy in relationship to documented output obtained from the institution (UNESCO-UNEVOC, 2020). TVET school based system include casual-industrial placements, the practical experience usually do not give adequate learning advantages, as well as usually not importantly closely related to the courses offered in school (Ruth & Deitmer, (nd). De Otero (2019) posits that innovations in service and product provided by TVET systems-linkage, networks and

institution internal agent resistance to new way in teaching methods, pedagogy and absence of new scientific tools and others (UNESCO-UNEVOC, 2019). TVET innovation may be challenged as a result of absence of technology supportive infrastructure facilities in delivery of lectures and practical, demonstrations, which could equip students of TVET with adequate knowledge in today's work environment, hence increase in unemployment rates (Boachin, 2019). Dissatisfaction about the content relevant/importance of formal educational courses to the industrial environment needs, as well as generally stated belief that institution based programme do stressed only on theories at the expense of the ability to use knowledge to carry out work environment needed competencies. Boachin (2019) conducted research on policy innovation in the TVET sector; the role of instructors in competency based training in Ghana TVET institution, the research is a review paper and qualitative in nature.

Obe, et al (nd) conducted a research on innovation in technical and vocational delivery: problem and prospects, the population was 303 in which 288 copies of research instrument were collected and analyzed at 0.05 level of significant with a mean value of 2.5 acceptance as the bench mark. It was accepted that p-value is less than 0.05 level of the t-critical value.

Ruth and Deitmer (nd) conducted research on the relationship between TVET and innovation. Qualitative methods were employed. Three research questions were employed on how diverse TVET systems could contribute to innovation capabilities through initial training of workers; which TVET system support workers; and development of innovation competence. It was concluded that theory function of work-based practical knowledge highly ignored store of knowledge. It was recommended that theory and practical should complement each other especially for TVET School based system as well as dual system of TVET.

Badawi and Dragoicea (2023) conducted a research on a value co-creation process in collaborative environment for TVET education. Technology acceptance model (TAM) were employed as specific objective. The population of study was an infinite, as a result, only105 respondents recorded as sample size of the study. The research employed optimization technique of partial least squares (PLS) to analyze the regression of latent parameter with help of smart PLS 3.3.2. It was formed that efficiency had highest influence on perceived ease of use of TVET practices at p-value 0.000. It was concluded that community interest in value co-creation and sustainability facilitated through a large act as provider of knowledge to establish common knowledge repository.

This research is anchored on Open Innovation theory propounded Henry Ghesborough two decades ago. The theory advocated that a firm should embrace externals ideas as well as internal ideas as well as Internal and external paths to the market. Also a purposive inflows and outflows of know-how to increase internal innovation and expand the market for outer use of innovation. The open innovation typology refer to R&D as an open system in which ideas can move from both inside of the firm and can move to the market via the same channels. Open innovation is of two folds; inbound open innovation which is a situation making use of discoveries that others make and establishment of relationship with them, in other to access their competence for firm innovation performance. Out-bound innovation refers to the purposive outflows of know-how which is meant to leverage existing technological capabilities, outside the boundaries of the organization, through sales of technologies intellectual property right and diverting it to outer environment. All these activities relates all variables of this study thematically in their orientations (Naqshbandi & Kaur, 2015).

The thrust of this research is to asses TVET innovation practices and tertiary institutions outcome and performance of the Federal Polytechnic, Ilaro. While the specific objectives are to:

1. Examine the strategy and management dimension on tertiary institution outcome and performance;
2. Evaluate the dimension of learning and teaching on tertiary institution outcome and performance;
3. Investigate the impact of product and service dimension on tertiary institution outcome; and
4. Determine the dimension of ecosystem management on the tertiary institution outcome and performance.

Technical Vocational Education and Training (TVET) is an element of education which entails in addition to traditional education, acquisition of practical know-how, appreciation, behavours that are germane to professions in many economic and social life (UNESCO, 2010). Innovation in fact bring a resource and there is no such thing like a resource except human being finds a use for something naturally and thus endows it with economic value (Drucker,

1985). Innovation is construed as a system of diverse economic, environmental and social problems with emphasis on skills needs in the market (Obe, etal, (nd). TVET innovation usually means new methods of teaching and learning, new qualification, courses, alternative path towards lifelong learning skills and emergent types of entrepreneurship training and practices (UNESCO-UNEVOC, 2019).

TVET innovation could also be referred to as social innovation. Social innovation in terms of the development of such institutions; as schools and universities, a civil service, banks and labour relations was far more difficult to achieve than building locomotives and telegraphs (Drucker, 1985).

TVET Innovation Dimensions

The innovative practices in TVET institutions among the followings according to UNESCO-UNEVOC (2019)

Strategy and Management Dimension: This dimension advocated that innovation should be embedded from Top-level of strategic intents to all areas of the organizations' participants and students. Besides, all faculties, courses should be innovative in their daily activities. In addition, it includes Leadership, Management, Organisational process and culture to sustain innovative undertakings. This entails persistent support for innovation from angle of Management functions such as planning, controlling, accounting and budgeting. Administrative and talent Management innovation as well as evaluative step activities and development of sustainable innovation system through the institutions spheres.

Teaching And Learning: This approach involves pedagogical and didactical model of evaluations almost always employing competency-based techniques in the teaching and evaluation of vocational skills and use of digital technology learning and teaching process. Embracement of apprenticeship schemes; methods of learning; project and challenge-problem solving based learning and digital techniques of teaching and impacting learnings.

Services and Product Dimension: This dimension involves institutional capabilities to make provision for innovative services delivery for learners and other collaborators. They may engage innovative research which could solve immediate problem in it research efforts by using it staff and facilities in development of product. Engaging in consultancy service through the use of its facilities for the community uses, as a training ground. This model required that TVET institutions should recognize the prior learning, adapt its services delivery, apprenticeship system and equally adapt work-based learning to the society needs as required by changing labour market dictates.

Ecosystem Relationship Management Dimension: This involves the role of outside communication as well as inclusion of external collaborators in the structure of governance in the TVET institutions. This involves engagement with individual and organisation that can provide feedback on graduated students of institutions who are working outside the institution. This involves employment rating by the employers on the performances of turned out graduates of TVET institutions in the society as well adaptation of learning and leaching; Product and Service; and Strategy & Management of the TVET institution with current industry's requirements.

Outcome and Performance Concept

The creation of innovation brings in the outcomes such as product, service, or ways of doing things that is latest to the state of the art (Walker et.al, 2010). Tertiary institution outcome is about the courses and programme offers to the public and mode of delivery as well as service being delivered. Tertiary institution performance relate to goals achievement of events; programmes; target; objectives; visions and missions. Tertiary institutions goals are teaching, dissemination of existing and old information as well as service to humanity as well as social responsibilities, research and solving of social problems in the local areas.

TVET Innovations Practices and Tertiary Institution Outcome and Performance of The Federal Polytechnic, Ilaro

TVET innovations is synonymous with social innovation. According to Drucker (1985) social innovation in relation to development of such institution as schools and Universities, a Public Civil Service, labour relations and financial institutions, was far more challenged than to advance building locomotives and telegraphs. TVET innovation is more demanding in 21st Century work place requirement that is ultra-changing and which require institutions and its work force to adapt to dictate require from industries as such, the institution authorities require to provide top notch

theory and practical to it teeming clients (students) which will enable them to acquire a new duties to meet 21st industrial work demand or increase their employability.

According to Renzulli (2020) lecturers, policy makers and administrators who fail to learn these skills themselves and establish opportunity for its clients (students) to learn way to gain advanced skills placed the future relevance of the educational organization at all degrees in state of shamble or jeopardy. On this statement, the authorities of the Federal Polytechnic engage in dimensions of TVET innovation practices as: Establishment of research and Directorate headed by Chief Lecturer to pilot affairs on institutional group and individual intention which was demonstrated during COVID-19 and innovation in designed Ventilators in the Polytechnic community during COVID-19 Pandemic. The establishment of Directorate of Robotic and innovation Centre to train students in Robotic and innovations sciences to all HND I students in Engineering, Applied Sciences and Environmental programs. The authorities over many years had introduced CISCO Certification ICT oriented programme to the institution in Engineering, Applied Science and Environmental programme which is an ICT Certification curriculum and all student do take certification examination in CISCO in the recent time. Management students also have been enlisted for CISCO Certification programme. Entrepreneurial Education with practical are also introduced to HND I and II and ND I students to prepare them in vocational course against nearest future in trades and every semester new vocations are usually added to the existing programmes. The authorities of the Polytechnic, the Department of Transportation Planning and Technology also introduced driving skill acquisition to other department like Marketing compulsory for HND I to train and certificated with driving skill for their future uses. The Management supports for various strategic innovation as Strategic Planning Committee and many programme of trainings and collaborations were put in place in the institution which served as enablers for the institution to conduct on-line class for the students during COVID-19 Era, through which NBTE approved the Federal Polytechnic, Ilaro as part of Open Distance Flexible e-Learning (ODFEL) programmes approved institution in Nigeria.

Methodology

This research work adopted survey design among the respondents that were managers, heads and owners of the organisations chosen from public, private and third sectors that have had employment interactions with the product (graduands) of the Federal Polytechnic, Ilaro over the years which were of infinite population through which 268 respondents actually completed the questionnaire for the study but 222 sample size were adopted. This is because Glenn (2003) posited that population within the range of 500 and below will have 222 sample size with use Cochran sampling model for infinite population. A detailed TVET innovations concept was explained in the covering note affixed to the questionnaire. The affixed covering note gave an understanding of what is required of the respondents in responding to the questionnaire promptly in relation to the variables of the study. The returned questionnaire were analyzes SPSS 23.0 version.

Table 1: Crobach's Alpha

Crobach's Alpha	**Cronnach's Alpha Based on Standardized item**	**N of Items**
.0745	0.749	25

Researchers computation (Aug., 2023)

This shows the instrument engage of good fit which measured what expected to be measured.

Table 2: (Model Summary)

MODEL	**R**	**R-SQUARE**	**ADJUSTED R SQUARE**	**STD ERROR OF ESTIMATE**
1	-759[a]	0.573	0.565	1.779
				1.77382

Source: Researcher computation (Aug., 2023.)

Predictors (Constraint) Strategy and Management; Product and Services; Learning and Teaching; Ecosystem Management. This indicates the coefficient R-0.757 depict a strong positive correlation of variables. Adjusted Coefficients of determination R2 = 0.573 which transformed to 57.3% is averagely explains the dependents variable changes can be explained by strategy and Management, Ecosystem Management; Product and Service and Learning and Training on Tertiary Institution outcome and performance. The residual 42.7% could be explained by other factors put up by the Federal Polytechnic, Ilaro in its institution performance/outcome.

Table 3: ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	P
Regression	916.017	4	229.004	72.782	.000[b]
Residual	682.776	218	3.146		
	682.776				
Total	1598.793				

Researcher computation (Aug., 2023).

(a) Dependent Variable: Tertiary Institution Outcome/Performance (TIOP)

(b) Predictors: (Constant): SM, PS, LT, EM

Strategy and Management = SM; Product and Service = PS; Learning and Teaching = LT; Ecosystem Management = EM. The ANOVA indicated that whole Model was significant 72.782 at P-Value. 0.000<0.05. This shows that the model is of good fit to explain joint interactions of variable of study which significantly influenced the overall result of the study.

Coefficients [a]

Table 4: Correlation Coefficients

Model	Unstandardized Coefficients B	Standardized Coefficients Std Error	Beta	T	Sig
Constant	1.751	800	.315	2.188	.003
SM	-311	.061	.164	5.099	.000
LT	-166	.065	.256	2.568	.001
PS	-245	.060	.164	4.106	.000
E	.159	.061		2.626	.009

Researcher Computation (Aug., 2023)

a. Dependent Variable: Tertiary Institution outcome/performance

Hypothesis

Ho_1: Strategy and Management Dimension has no impact on Tertiary Institution Outcome and Performance

Ho_2: Learning and Teaching model has no effect on Tertiary institution outcome and performance

Ho_3: Product and Service Concept has no effect on Tertiary Institution Outcome and Performance

$H0_4$: Ecosystem Management dimension has no effect on Tertiary Institution outcome and performance.

The equation result depicted:

$Y = 1.751 + 0.311_{x1} + 0.166_{x2} + 0.245_{x3} + 0.159_{x4}$

The study revealed that taking all variables Constant Tertiary Institution Outcome and Performance of the Federal Polytechnic, Ilaro have positive effects with slopes of B1 = 0.311; B_2 = .166, B_3 = 0.246; and B_4 = 0.159 respectfully holding the variables constant ,Tertiary Institution performance would 1.751 when all the variables of Dimension

increase by one unit jointly. Holding all variables Constant, performance of Tertiary Institution performance and outcome will be: 1.751.

This study found out that there was positive and statistically significant association between Strategy and Management dimension and Tertiary Institution Outcome and Performance at P-Value 000. The management of the institution through good leadership articulated TVET innovation practice in their administrative activities which is demonstrated in their outcomes through good landmark on innovative practices recoded in the institution. This in line with conclusion of Fadipe et al (2021) that creativity and innovation is rests on the people, educational institution and the government.

The study found that there was positive and statistical relationship between Learning and Teaching on Tertiary Institution outcome performance at P-Value .001<0.0.5.

The study showed that there was a positive and statistical association between Product and Service dimension on Tertiary Institution outcome and performance at P Value .000<0.05. This is in line with the conclusion of Obe, et.al. (nd) that digital culture should be embedded in instructional delivery in the tertiary institutions.

The study shows positive and statistically and insignificant association between Ecosystem management and Tertiary Institution outcome and performance at P Value .009>0.005.

Conclusion

The study concluded that Strategy and Management dimension has positive and significantly influenced the Tertiary Institutions outcome and performance. The study concluded that the leadership engage in Management strategy that innovative in nature which enable the institution to survive in the waves of crisis hit the Tertiary Institution especially COVI-19 crises.

The study concluded that Learning and Teaching dimension had positive and significant impact the Tertiary Institutions outcome and performance. The learning and Teaching model of the institution is linked up with industrial requirement standard based on innovate programme of ICT based programme introduced to students of the institution over the years.

The study concluded that Product and Service dimension had positive significant impact on the Tertiary institution performance through which the graduates of the institution adjudged through this study of innovative research conducted that was used to navigate crisis of the past in innovative invention carried out by the institutions. The methods employed had assisted the institution to be selected as one of the ODFEL programme facilitators by the NBTE.

The study revealed that Ecosystem had positive but insignificant effect on Tertiary institution outcome. This is an indication that the institution should engage more interaction of beneficial relationship with other partners in its programme delivery as well as programmes mounting to institution, so that the teachers and student could have best practice information which would assist them.

Recommendations

The study findings indicated strategy and Management had positive and significant effect on Tertiary Institution outcome and performance. This study recommends that the Management should continue to engage the social innovative Strategy and Management in the management of institution which had produced good results should be continued.

The study findings showed that Learning and Teaching dimension had positive and significant effect on Tertiary Institution's outcome and performance especially in the area of digital technology and Teaching on the students of the institution, as one of its stakeholders. This study recommend that lecturer and technologist should be made to undertake internship in the related industry during the three months holiday to acquaint them with industrial latest practices in their area of studies

The study findings indicated that Product and Learning, the institution should continue to use its faculty in generating IGR, where students' research project should be developed and commercialized to create an avenue for more IGR

instead of relying on government for fund. Moreover, it also recommends that the institution should continue to adapt product and service to the needs of local environment nationally and internationally.

The finding revealed that Ecosystem management had positive but insignificant effect on Tertiary Institution. It is recommended that this institution should collaborate strategically in area of student apprenticeship system where each student should be made to attend one (1) day off-class apprenticeship practical demonstration from local or informal practicing Technicians to enable the student understand and embraces apprenticeship learning after their academic programmes in their various homes.

References

Asia Development Bank (2014*). Technical and Vocational Education and Training for Accelerated Human Resource Development in South Asia,* Australia Aid.

Badawi, S. &Dragoicea, M. (2023) Towards a value co-creation process in collaborative. Environment for their TVET Education. *SustainabilityV*ol.15(1792). http://doi.org/10.3390/SU15031792

Boachin, P. (2019): Policy innovation in the TVET Sector: The role of Instructors in Competency-Based Training in Chanian TVET Institutions. *European Journal of Training Development Studies. Vol.*6(1), 42-57.

De Otero (2019*) Innovation in TVET*. UNESCO UNEVOC. Virtual Conference.

Glenn D. Israel (2003*) Determining Sample Size*. Agricultural Education and Communication Department, Cooperative Extension, IFAS University of Florida. http://edis.ifas.ufls.edu.

Kazaure (2021*) Repositioning Education Towards Addressing Technological Challenge of the Nation in the 21st Century, 1st Raheem Oloyo Annual Public Lecture*, Directorate of Research and Development, The Federal Polytechnic, Ilaro.

Naqshbandi M.M & Kaur, S. (2015) *Theories in Innovation Management In selected theories in Social Science Research.* UM Press.41-45. ISBN 9798831007946

Obe, P. I., Madu, M. A. &Onah, E. (n.d*) Innovation in Technical and Vocational Education and Training (TVET) Instructional Delivery: Problems and Prospects.*

Renzulli, J. S. (2020) The catch-A-Wave Theory of Adaptability: Core Competencies for Developing Gifted Behaviours in the Second Machine Age of Technology. *International Journal of Talent Development and Creativity* 8(1) August, 2020 and 8(2) December, 2020, 79-91

Ruth, K. & Deitmer, L. (n.d) *The Relationship between TVET and Innovation* (2nd draft).

UNESCO-UNEVOC (2019*) Innovation Hubs Practices at a Glance*. UNESCO Publication

UNESCO-UNEVOC (2020) *Innovating Technical and Vocational Education and Training*. A Framework for Institution.