



**DIGITAL TRANSFORMATION AND OPERATIONAL
CAPABILITIES OF TVET INSTITUTIONS IN OGUN STATE.
(A Case Study of the Federal Polytechnic, Ilaro, Ogun State)**

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Abstract

This study investigates the capabilities of digital transformation on TVET, specifically at the Federal Polytechnic in Ilaro, Ogun State. The study adopted a survey design. The population comprised all 514 academic staff members. Taro Yamane's sampling formula was used to choose 225 respondents. A simple random selection technique was employed to select responses, ensuring each participant had an equal chance of being chosen. A four-point Likert scale was utilized, with options of Strongly Agree (4), Agree (3), Strongly Disagree (2), and Disagree (1). A structured questionnaire was utilized to collect responses. The instrument's validity and reliability were confirmed using component factor analysis and Cronbach's Alpha. Multiple regression analysis was used to summarize data obtained using a social science statistical tool (SPSS version 23) for inferential purposes, with hypotheses tested at the 5% significance level. Findings: E-learning and E-repository have significant effects on TVET operations ($p\text{-value} < 0.05$). The study concludes that digital transformation has an impact on TVETIOC. The study also recommends that to remain relevant and competitive in the modern day, higher education institutions should adopt and adapt to digital technologies and innovations in teaching and learning.

Keywords: Digital Transformation, E- Learning, E- Repository, TVET, Operational Capability.

1.0 INTRODUCTION

Technical and Vocational Education and Training (TVET) is widely recognized and is vital for any country's economic growth and development. It has the potential to give occupational skills, alleviate unemployment, and diminish poverty and social vices (Bello and Muhammad, 2021). According to Ansah and Ernest (2013), TVET aspires to provide persons with the essential technical and professional competencies for the country's socioeconomic and industrial development. In Nigeria, TVET plays a critical role in preparing persons for employment, providing them with the skills required to satisfy the economy's demands. Many individuals feel

that education propels human development, social mobility, and economic success in any Community. However, some contend that the sort and quality of education provided to a country's inhabitants is determined by its level of development. As a result, TVET must undergo a digital transformation (DT) to keep up with the swift growth of the digital economy, the skills and occupations that the labour market requires.

Accelerated technological breakthroughs have resulted in tremendous transformations in many areas of society, notably, academia. To remain relevant and competitive in today's world, institutions must undergo digital transformation. Because TVET programs are the foundation of TVET delivery, analyzing DT in them is crucial. (Lin, Pang, 2024). The future of TVET, led by innovations in teaching techniques, digital technology, and collaborative learning practices, shows immense promise for enhancing the Nigerian workforce's employability and global competitiveness (Uduafemhe, 2021).

According to Chen and Kim (2023), digital transformation improves teaching and learning processes, educational activities, education systems, and even the overall performance of the educational community. Digital transformation is a significant shift in the use of digital technology to achieve educational goals through the optimization of the processes, data utilization, and the development of more innovative products and services.

Purwanto, Fahmi, and Sulaiman (2023) state that the function of digital transformation is to empower teachers to encourage skills and usage of digital technology in dealing with and equipping students throughout learning. Likewise, digital transformation can motivate teachers and staff to implement innovations that focus on knowledge transfer and acquisition to solve problems or complete tasks with pupils, including e-repositories and e-learning, i.e. the use of electronic devices for learning, teaching, and research. It includes a variety of tools to help lecturers

and students perform effectively. It is also described as any learning that takes place on the internet or intranet (Alsulimani & Kaabi, 2018). "E-repository is a novel approach for conserving and spreading digital academic works created by students and lecturers from diverse educational institutions. The presence of digital transformation not only increases the ability of instructors and students to adapt to new technologies but also promotes the development of novel methods to incorporate digital solutions into education.

While the internet can promote enjoyment, it also introduces new risks, such as excessive spending, online bullying, lower efficiency, and greater loneliness. Unfortunately, excessive use of electronic devices and frequent access to digital networks, particularly in professional contexts, can cause uneasiness and cognitive fatigue (Fleaca, Fleaca, & Maiduc 2022). Nonetheless, digital transformation is vital in deciding the direction and emphasis of an organization's change, which is becoming increasingly important for organizations and institutions working in dynamic and uncertain markets. However, higher education institutions in underprivileged nations throughout the world have experienced heavy criticism in recent years for producing low-quality results. Therefore, higher educational institutions in poor countries must urgently catch up with advances in teaching, learning, and research processes as in developed economies. Furthermore, institutions of higher learning confront significant obstacles in adjusting to changing capacities as a consequence of technological advancements, increased digital connectivity, global market expansion, flexibility and migration, and workplace diversity. As a result, evaluating the capacities of digital transformation on TVET institutions is critical, with the Federal Polytechnic of Ilaro serving as a research location. The aim of the study is to: (i) assess the effect of e-learning on the operational capabilities of Federal Polytechnic, Ilaro. (ii) Investigate the effect of e-repository on the operational capabilities of the Federal Polytechnic, Ilaro. This study is anchored by the

Technological Determinism theory developed by Thorstein Veblen (1857-1929). The theory holds that as we move from one technological era to the next, technology affects how individuals think, feel, and behave in a society, as well as how our society operates.

LITERATURE REVIEW

TVET

Technical Vocational Education (TVE) is recognized as that aspect of education that leads to the acquisition of practical and applied skills as well as basic scientific knowledge that will enable an individual to secure employment in a particular occupation for a sustainable livelihood. These skills cannot be acquired in a vacuum but rather in a well-established and functional workshop with the right tools, equipment, and machines for effective implementation of the TVET programme. (Ayonmike, 2016). Meanwhile, capability has been identified as a critical factor in the adoption of TVE innovation. Firms are more likely to consider adopting new technology when it is recognized as compatible with work application systems. (Agbo & Agbaji 2024).

DIGITAL TRANSFORMATION

Many potential benefits of digitization are yet to be completely realized by enterprises. One possible explanation is that firms do not fully comprehend the impact of digital transformation on their organizational structure. Kozarkiewicz (2020) describes digital transformation as the application of digital technology to initiate and strengthen important transformations in the company and society. It is a shift that creates or impacts electronic gadgets in all aspects of human life. With the rapid expansion and emergence of technology developments, educational institutions have begun to employ new teaching methods and approaches. Consequently, digital transformation is described as a company's transition to a business plan that incorporates digital technology into

innovative goods and services, resulting in new revenue streams and prospects while boosting the value of its products.

E-LEARNING

Electronic learning is the acquisition of knowledge through electronic media, such as the internet, or offline using ICT devices such as computers, smartphones, wearable technology, CD-ROMs, and flash drives (Adeola, 2023). E-learning has become an extremely important element of education and preparation around the world, particularly during the coronavirus epidemic, which disrupted traditional forms of learning. Nigeria, like other developing countries, is exploring the use of technology to improve education and training for its growing population (Ugah, Omoke, Uguru, 2023). Its practicality, which includes easy access from any location; adaptability, which adapts to the needs and speed of learning; and profitability, which lowers expenses, are its main benefits (Edmundson, 2007).

E- REPOSITORY

Safdar (2021) asserts that libraries worldwide are concentrating on building institutional repositories in part to support their researchers and instructors in achieving their learning and research goals. Scholarly and research resources produced by academic institutions are gathered, arranged, archived, and shared by repositories.

Empirically, Tuire (2022) investigated how digital platforms and supply chain capabilities affect operational effectiveness. The study established that digital platforms have a favorable and considerable impact on supply chain capability. Also, Nabeel (2021) explored how digital technology enhances organizational productivity, effectiveness, and efficiency. The report established that globalization and digitalization increased corporate effectiveness. Nwankpa and Yaman (2016) explored the mediating influence of digital transformation in the relationship between IT competency and business performance. The study shows that digital transformation

improves innovation and company performance, while innovation is reaffirmed as having a positive impact on firm success.

2.0 METHODOLOGY

The study adopted a survey design. The population comprised all the 514 members of the Academic Staff of Federal Polytechnic, Ilaro, Ogun State, Nigeria (Central Administration, February 2025). Taro Yamane's sampling Technique was used to draw 225 respondents while a simple random sampling technique was adopted to select respondents so that each participant stands an equal chance of being selected. Responses from respondents were retrieved through a structured questionnaire. Multiple regression analysis was used to summarize the data obtained with the aid of a statistical package of social science (SPSS version 23) for inferential purposes with hypotheses tested at a 5% level of significance.

4.0 DATA ANALYSIS AND INTERPRETATION OF RESULT

Model specification:

The model for this study is specified below: $Y = f(x)$, where y is the dependent variable and x is the independent variable.

$$TVET = \beta_0 + \beta_1 EL + \beta_2 ER + \dots + e$$

Where TVETIOC=Technical Vocational Education Training. Institutional operational capabilities

EL = E-Learning, ER = E- Repository, $\beta_0, \beta_1, \beta_2$ = Coefficients e = error term.

Table 1: Reliability

Reliability Statistics	
Cronbach's Alpha	N of Items
.934	21

Source: Researcher's Compilation from SPSS version 23, 2025.

In Table 1, the Cronbach's Alpha coefficient for the reliability test was 0.93, beyond the threshold of 0.70, indicating credible research data.

Table 2: Model Summary**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.965 ^a	.932	.931		.74044

a. Predictors: (Constant), ER, EL

Source: Researcher's Compilation from SPSS version 23, 2025.

Table 2 reveals that the explanatory factors (E-Learning and E-Repository) jointly accounted for 0.93, indicating that the independent variables (EL and ER) account for 93% of the variation in TVETIOC.

Table 3: ANOVA

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	
1	Regression	1659.693	2	829.846	2513.614	.000 ^b
	Residual	121.164	221	.548		
	Total	1780.857	223			
a. Dependent Variable: TVETIOC						
b. Predictors: (Constant), ER, EL						

Source: Researcher's Compilation from SPSS version 23, 2025.

The ANOVA results above explain the combined influence of the independent and dependent variables. The analysis revealed that the combination of independent factors had a significant positive effect on TVET ($F = [2/221] = 2513.614$; $P < .05$). According to these data, the study concludes that E-Learning and E-Repository have a major impact on the Operational capabilities of TVET institutions in the study area.

Table 4: Coefficient**Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.500	.534		12.171	.000
	EL	.660	.025	.896	25.999	.000
	ER	.410	.039	.080	2.327	.001

a. Dependent Variable: TVETIOC

Source: Researcher's Compilation from SPSS version 23, 2025.

Table 4 displays the relative impact and significance of each explanatory variable (e-learning and e-repository) on the dependent variable (TVETIOC). Both had a statistically significant effect on

the TVETIOC projection. The individual variables t-statistics demonstrate that E-Learning (EL) has a strong positive and statistically significant effect on TVETIOC ($t= 25.999$; $p < 0.05$), whereas ER has modest positive and statistically significant effect on TVETIOC ($t= 2.327$; $p < 0.05$). This finding implies that a unit increase in EL causes a 25.999 unit increase in TVET institution's capabilities. Similarly, a unit increase in ER results in a 2.327 unit increase in TVET institution's capabilities in the Federal Polytechnic Ilaro, Ogun state. Based on this finding, the null hypothesis was rejected, and the alternative hypothesis was accepted with a 95% confidence interval.

Hypotheses Testing

Decision Rule:

If the p-value for the hypothesis being tested is greater than 0.05 (5% level of significance), we reject the alternate (H_1) hypothesis in favour of the null (H_0) hypothesis. The opposite will be true if the p-value is lesser than the 5% level of significance.

HYPOTHESIS ONE

H_{01} : E-learning has no significant effects on TVETIOC.

H_1 : E-learning has significant effects on TVETIOC

Decision: As indicated in Table 4, the t-statistic for E-Learning is 25.999, and the p-value is less than 5%, therefore the study rejects the null hypothesis and finds that E-Learning has a substantial effect on TVETIOC in the study area.

HYPOTHESIS TWO

H_{02} : E-Repository has no significant effects on TVETIOC.

H_2 : E-Repository has significant effects on TVETIOC

Decision: The t-statistic of the E-Repository is 2.327, and the p-value is less than 5%, the study rejects the null hypothesis and indicates that E-Repository has a substantial effect on TVETIOC in the organization study region.

5.0 CONCLUSION AND RECOMMENDATIONS

Based on the findings of the research, it was concluded that digital transformation has a substantial impact on TVETIOC. The study's findings demonstrated a substantial, favorable, and statistically significant association between E-Learning and TVETIOC. The study concludes that E-Learning helps considerably to the growth and development of the education system at FPI, Ilaro, by allowing for flexibility in learning and complete autonomy. This conclusion is consistent with the findings of Alsulimani¹ and Kaabi 2018 among others.

Furthermore, the study's findings demonstrate a weak positive and statistically significant association between E-Repository and TVETIOC. Thus, the study concludes that E-repository allows all sorts of learners, teachers, and researchers, regardless of social background, economic status, academic level, or position, to interact with research works from anywhere in the globe. This result is in line with the findings of Ponti, Cerrillo-i-Martínez, & Di Mascio, 2022 among others.

Given the above, the following recommendations were made: The Management of the Federal Polytechnic Ilaro should increase its digital technology compatibility, particularly in the usage of websites and social networks, through effective technology portfolio and capability management in terms of their operations. To fully utilize digital technologies, it's important to link their functionality with institutional needs. This necessitates enhancing workers' digital competencies. Furthermore, other higher educational institutions, including the Federal Polytechnic ilaro, should adopt and adapt to the usage of digital technologies as well as advance in teaching and learning to remain relevant and competitive in today's learning world.

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