IMPACT OF WORKERS' TRAINING ON PRODUCTIVITY IN SMALL AND MEDIUM ENTERPRISES IN NIGERIA

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ABSTRACT

Firm productivity has become a crucial component of competitive advantage in modern businesses, prompting concerted efforts towards understanding the underlying factors that drive it. In this study, the impact of workers' training on productivity in small firms is examined. It is argued that firms that regularly train staff members would more generally adopt better production techniques, especially the use of technology, which will aid labour productivity, thereby, boosting innovation and overall productivity. The survey research method was employed in the empirical analysis using data from the World Bank Enterprise Survey for small enterprises in Nigeria. Using the Generalised Method of Moments (GMM) modelling technique, the study found that workers' training is crucial in stimulating productivity among small enterprises in Nigeria. In particular, current training and long-term staff development are found to promote productivity among the firms. It is also shown that training enhances technology diffusion within small firms in Nigeria. These outcomes imply that SMEs that engage in direct training have better opportunities for productivity growth, especially in the long term in Nigeria. It is, therefore, recommended that targeted employee training programmes should be adopted by small businesses as part of their growth and development strategies.

Keywords: *employee training, firm behaviour, productivity, skill development, technology*

JEL Classification: *D21, J3, J24, L25*

INTRODUCTION

The human factor in the firm has been identified as the major underlying driver of productivity and long run sustenance (Fialho, Quintini & Vandeweyer, 2019). The processes through which human capital delivers productivity enhancing impacts are, however, less clear and have continued to generate debate. While some suggest that the initial quality of human capital accumulation (through appropriate recruitment) should be the critical focus for the firm (de Grip & Sauermann, 2012; Menon, 2013), other studies consider the continuous development of human capital in the firm as the relevant process (Bartel, 1994; Fialho et al, 2019). Essentially, training is considered as a further and diverse human capital building process through education. In this

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case, while education provides a basis for the development of potential and lays the foundation for employability, training provides the core work skills, general knowledge, industry-based and professional competencies that facilitate the transition from education into the world of work (Choi, Jeong & Kim, 2019). Thus, employees need training to ensure adequate and sustained supply of human infrastructure with relevant skills to man operational and management positions in the firm. There is, therefore, a continual need for the process of staff development, and training fulfils an important part of this process.

Although many business enterprises in Nigeria have been bedevilled with perennial challenge of stagnant or even declining productivity, it appears that most have not considered training as an integral tool for lifting the poor productivity systems (de Grip & Sauermann, 2012; Malaolu & Ogbuabor, 2013). This challenge is particularly prevalent among small and medium enterprises (SMEs) in Nigeria where little consideration is given to the contribution of the human capital component (Malaolu & Ogbuabor, 2013; Halilu, 2015). For instance, a study by the World Bank (2018) indicated that only 30.7 percent of SMEs provided formal training for workers in the previous year. Among the SMEs that provided training, only 44.1 percent of the workers were trained. This shows that workers' training is an essential issue among SMEs in Nigeria.

Moreover, most of the studies on training in the firm have focused on the general impacts on overall financial performance (which is often measured in purely accounting terms) and have left out the crucial place of productivity (e.g., Marin-Diaz, Chiaramonte-Cipolla, Llinas-Audet & Escardibul, 2014; Fialho et al, 2019). The major issue with this type of studies is that, while human capital upgrade relates to basic development of the firms, financial performance can only measure recurrent conditions of the firm, instead of the core sustainability conditions over time (Siepel & Dejardin, 2020). Essentially, the potential of training to drive productivity of SMEs in Nigeria has been generally underexplored.

Based on the foregoing issues, the main aim of this study seeks to assess the impact of workers' training on the productivity of small enterprises in Nigeria. The objective is to present the pattern of interaction between training of employees among SMEs and the contribution of such enhanced human capital to the productivity trajectory and technology drive of the small businesses in Nigeria.

LITERATURE REVIEW

Conceptual Review

On a general scale, productivity is the relationship between the quantity of output and the quantity of input used to generate that output. Moreover, productivity is calculated as the ratio of the output produced to some measure of the inputs used (Dolman, Parham & Zheng, 2007). Output is seldom uniform at the organizational level; hence, it is usually measured in financial value such as sales, production value, or value added. Thus, productivity is a factor that provides an indication of efficiency and scale economies. In this case, the company that produces the highest output, given that two companies use exactly the same amount (and quality) of production factors, is said to have the higher productivity (Biatour & Dumont, 2011). In terms of applicability, productivity measures are used at the level of firms, industries and entire economies. Essentially, productivity is a measure of how effectively the resources of a system are translated into the production of goods and services. In this study, productivity is considered in monetary terms with respect to the sales of output in terms of the human (labour) factor.

Training is understood in broad terms, covering the full sequence of life stages (International Labour Organisation, ILO, 2010). In relation to the labour market participation, basic education gives each individual a basis for the development of their potential, laying the foundation for employability. On the other hand, initial training provides the core work skills, general knowledge, and industry-based professional competencies that facilitate the transition from education into the world of work. According to Onasanya (2005), training is a form of specialized education aimed at giving the trainee a particular or specialized knowledge, skill and attitude which he must possess to effectively perform in a given position.

In terms of firm management and development, training is a process within which employees are recruited, selected, trained, motivated and required within an economic system. This form of training (which this study focuses on) is formal in nature and is strategically performed as part of strategic human resource development as well as for firms' overall development (Alao, 2010). These programmes began to appear in large corporations in 1940 and early 1950s. In the past few decades, these processes have become prevalent among firms in developing countries. The ever-increasing technological sophistication among firms has also necessitated the need for more formal training, irrespective of the type of firm being considered, especially in this age of computer technology. Thus, training and

technology can be said to go hand-in-hand in firms, especially the SMEs (Alao, 2010).

According to the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN, 2014), small and medium enterprises (SMEs) are those that employ between 10 and 199 workers at any given time, either regular or casual. In particular, firms that employ 10 – 49 workers are small firms, while those employing 50 - 199 workers are medium firms. This is the definition of SMEs that this study employs.

Theoretical Review

Theoretical literature has identified a number of factors that may affect productivity growth in the firm. These models developed by Griliches (1979), Cohen and Levinthal (1990) among others, have included the basic neoclassical inputs of labour and capital as well as application of technology and investment in research and development (R&D). These factors form externalities that spill over to output size and sales prospects and multiply in relation to the absorptive capacity of the firm. In the models, the quality of labour is also regarded as a major determinant of productivity growth within an endogenous structure. A genuine accounting for the quality of workers directly reinforces the overall externality effects on productivity of firms.

The theoretical relationship between workers' training (which improves labour quality) and productivity is summarised in Figure 1. The diagram shows that training is an endogenous factor that appears to escalate, especially at higher levels of the firm.

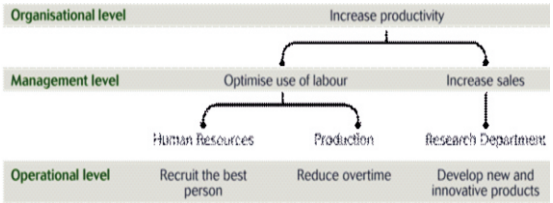

Figure 1: Theoretical relationship between training, productivity and firm performance.
Source: SPRING Singapore Report (2011)

The theoretical relationship between firm training and productivity presents a structure in which cost of production is reduced in the long run and resources are more efficiently used (Dearden, Reed & van Reenen, 2006). On a theoretical basis, there could be three channels through which training may lead to expansion in productivity of a firm (Dearden et al, 2006; Martins, 2022). First, training directly generates knowledge which leads to better accumulation of skills. This implies that

training increases employee capacity and the capability to adapt within a wider range of functions and activities. Second, workers with more overall training are better able to learn new activities and more easily incorporate management or production techniques. This makes adaption to different operational environment more seamless for the employees. Third, training improves the ability to process information. This means that training is associated with the ability to make better decisions, particularly in a volatile environment or one that is in rapid transition.

The theoretical basis for the formulation of the relationship between training and workers' productivity is explained in an extension of the neoclassical production function that addresses firm-level applications. According to the modelling developed by Stiroh (2001), the output of a firm (Y) under the neoclassical assumptions of competitive factor markets is made up of share-weighted rates of primary inputs (capital, K, and labour, L) modelled as:

$$Y_i = A_i\, f(K_i, L_i) \qquad (1)$$

The productivity growth of the firm i (A_i) is computed as the difference between output growth and the share-weighted growth rates of primary inputs (capital and labour) which is expanded (in logs) and stated as:

$$\Delta lnA_i = \Delta lnY_i - v_K \Delta lnK_i - v_L \Delta lnL_i \qquad (2)$$

where Δ represents a first difference, v_K is capital's share of output, and v_L is labour's share of output. The theory, therefore, identified the sources of average productivity growth in the firm by transforming equation (2) as:

$$\Delta lny_i = \Delta lnA_i - \Delta lnH_i \qquad (3)$$

$$= v_K \Delta lnk_i + v_L(\Delta lnL_i - \Delta lnH_i) + \Delta lnA_i \qquad (4),$$

where lowercase letters are per hour worked.

From the model, growth in productivity depends on three factors: (i) capital deepening, Δlnk, which captures the increase in capital services; (ii) growth in labour quality, which measures substitution toward workers with higher marginal products and is defined as the difference between the growth of labour input and the growth of hours worked ($\Delta lnL - \Delta lnH$); and (iii) technical change, ΔlnA. Thus, it is the labour quality, not total labour supply, that contributes to firm growth according to this model. One of the factors that drive labour quality is training (Stiroh, 2001). Hence, from equation (4) training of workers will increase ΔlnL and, thereby, lead to overall rise in productivity in the firm.

Empirical review

The empirical literature also follows training strand of argument and research for their conclusions. In general, it is shown that training by firms is an investment in which both workers and firms can share the benefits over time (Dearden et al, 2006; de Grip & Sauermann, 2012; Fialho et al, 2019; Chhetri, Gekara, Manzoni & Montague, 2019). While workers benefit through higher wages and increased skills, the firm benefits through improved capacity and increased innovation. For instance, results of analysis of Belgian data found that increasing the proportion of workers who receive training by 10 percentage points directly leads to 1.7% to 3.2% rise in productivity and 1% to 1.7% increase in wages (Almeida & Carneiro, 2009). In comparison, therefore, the firms appear to benefit more from training provided to employees. Also, Konings and Vanormelingen (2015) employed randomized tests to how that participation in a randomly selected training programme led to a 10% increase in productivity of the participants.

Furthermore, Malaolu and Ogbuabor (2013) applied a structured questionnaire to derive data on the effects of training on public sector workers in Nigeria. They found that manpower training programmes in ministries, departments and agencies (MDAs) led to improvement in efficiency and job productivity. In particular, the study found that trainings that are based on a structural assessment of workers' manpower needs appear to have more beneficial effects on their productivity. In research on a group of transitional economies, Thang and Quang (2011) used data for 196 companies to evaluate the impact of training on productivity across industries to measure the level of impact of training on firm performance in Vietnam. The study found a direct link between training and productivity since training led to increased sales even with the same number of workers. Similar findings were made by Menon (2013) and Tezzele (2022) by demonstrating generally positive effect on productivity since training was found to directly enhance skills and competencies as well as innovative capacity of employees.

The pattern and dimensions of effect of training on productivity have also been evaluated. It is argued that training may have limited effect on productivity in certain segments of the firm, for example, between lower-level and top-level workers or

between different industries. In this regard, Davar and Parti (2013) examined the relationship between training and productivity at different levels of firms in India. The study found that training affects the productivity levels of all segments of workers, including top-level, middle-level, and bottom-line employees. In the same vein, Konings and Vanormelingen (2015) found that training positively affects productivity irrespective of the quality of the work that an employee is involved in. Adiele and Ibietan (2017) also found that training activities for employees in the Nigerian public sector have generated about the same level of productivity outcome as training in the private sector. Morikawa (2021), however, found that training appears to benefit workers in services industry than those in the manufacturing industry in Japan.

Another area in the training-productivity research relates to the type of training received. In this direction, Fialho et al (2019) found that formal and non-formal training only deliver limited impacts on productivity. Rather it is the informal component of training that produces more intensity within the workplace. There is also evidence that firm-sponsored training complements other types of investment in the firm. For instance, Morikawa (2021) found that among Japanese firms, employer-provided training has a stronger impact on productivity. Also, Chhetri et al (2019) demonstrated that employer-sponsored training had a multi-dimensional effect on productivity in the firms. The study by Bartel (1994), however, demonstrated that it is well-targeted training, and not just general training, that provides better productivity enhancement to firms.

For SMEs, the weak focus on training has been linked to the initial consideration of training as a costly and risky investment since workers may leave their firms after being trained (de Grip & Sauermann, 2012). The role of training was, therefore, considered as temporal even though there was the realisation that it yielded high returns. More recent studies have, however, demonstrated that the costs of training can be more rapidly and easily recouped, suggesting that training of employees does not pose as much threat to firm investment as was initially thought (Lyons & Zhang,

2017; Martins, 2022). Moreover, trainings that apply to technological applications seem to be more easily recouped by the firm irrespective of its size (Lyons, 2020; McKenzie & Puerto, 2021). Thus, the prevalence of technology in production and services has heavily tilted the productivity contribution of workers and resulted in new approaches to evaluating productivity in the firms.

The results from the empirical literature have however been general and the ones that involve Nigeria have not made the connections that are the main goals of this current study (for example, Aroge, 2012; Ofoegbu & Joseph, 2013; Halilu, 2015). Although policymakers need to consider the importance of firm training as a key driver of productivity growth, there is little empirical outcomes in the case of Nigeria. Although the impact on financial performance may be clear, there is the need to determine the role of training in driving sustainability among smaller firms over time. This is the area where this study contributes to the research on firm training in Nigeria.

METHODOLOGY

Model Specification

The model specified for the effects of training on productivity is based on the theoretical framework as well as the modified neoclassical production function developed by Segarra-Blasco and Teruel (2011) and Lorenz (2014) which relates the representative firm "*i*" with the effective labour, capital, and intermediate materials. Note that effective labour is used in this model to highlight the influences of training on the labour component of productivity. In general, the model assumes a capital-augmenting technology specified as:

$$Y = (TL)^{\alpha}(Ke)^{\beta} \quad (5)$$

Where Y represents output, T is labour training, L is labour input, and K is capital input. In productivity terms (productivity is output to labour ratio). The model becomes:

$$Y/L = T^{\alpha-1}(Ke)^{\beta} \quad (6)$$

This can be further written as

$$y_i = T^{\alpha-1}(Ke)^{\beta} \quad (7)$$

where y is productivity and i is the representative firm. In a linearised form, the model can be written as:

$$y_i = \xi_0 + (\alpha-1)t_i + \beta X_i + u_i \quad (8)$$

where t represents the log of training and X represents the logged variables that make up the covariates that include the capital and technology factors and other factors assumed to be independent from the training effects on productivity, including working conditions and remuneration, and u is the error term. In the model in equation (6), it is presented that productivity is primarily determined by workers training with the inclusion of other factors as controls.

The full econometric model to be estimated for the productivity equation is designed to capture the direct impact of workers' training (and other relevant factors) on a firm's productivity. Productivity is measured as the per capita form of y_i in (8). The model is specified as:

$$y_i = \delta_0 + \delta_1 training_i + \delta_2 cap_i + \delta_3 R\&D_i + \delta_4 fage_i + \delta_5 finacc_i + \delta_6 manedu_i + \delta_7 wedu_i + \delta_8 envr_i + \mu_i \quad (9)$$

Where:

y	=	productivity
training	=	workers' training in the firm
cap	=	capacity utilization in the firm (to proxy capital use)
R&D	=	investment in research and development
fage	=	firm age
finacc	=	access to finance by the firm
manedu	=	level of education of manager
wedu	=	level of education of workers
envr	=	the business environment of firm.
μ	=	the stochastic error term.

In the model, training is measured using an item in the World Bank Enterprise Survey questionnaire that requests respondents to respond to whether there was training conducted regularly on workers in the past three years. In this case, the dummy

variable was categorized as 1, for firms that indicated training, and 0, for firms that did not indicate training. As highlighted in the theoretical presentation, training is expected to exert positive impact on productivity in the firm. Availability of training programme is measured as whether the firm has formal system of training (in terms of codes and procedures). Capacity utilization is used to capture the capital application rate in the firm and is measured as the rate of usage of capital in the firm. Research and Development is measured as those firms that have spent on R&D in the past three years, while firm age is measured in years. Access to finance is measured as firms that have applied for and obtained loans in the past three years, while the business environment is measured in terms of the firms which state that regulations have negatively affected their output. The level of education of managers and workers are measured as the highest educational attainment of the respondents (managers or workers).

From the literature reviewed, it has been demonstrated that a major aspect of productivity in modern firms involves the use and application of technology. Hence, the study seeks to evaluate the impact of workers' training on efficiency of use and application of technology in the firm. The model to be specified in this case is:

$$techapp_i = \delta_0 + \delta_1 training_i + \delta_2 training * tech_i + \delta_3 cap_i + \delta_4 R\&D_i + \delta_5 fage_i + \delta_6 finacc_i + \delta_7 tech_i + \delta_8 manedu_i + \delta_9 wedu_i + \delta_{10} envr_i + \mu_i \quad (10)$$

In the model, *techapp* is the application and use of technology in the firm which is proxied by the contribution of technical input to sale. An interaction term between training and availability of technology in the firm is included in the model to capture how more training can enhance the quality of technology in the firm. Availability of technology in the firm (*tech*) is captured as the presence of internet and computerised processes in the firm.

Data and methods

The data used in this study are based on the World Bank Enterprise Survey data collected in Nigeria between April 2014 and February 2015 under an initiative of the World Bank. The Enterprise Surveys use structured questionnaires to collect information from a representative sample of the non-agricultural formal private economy for a total of 19 states. The data collected provides a description of the representative private firm in the country and also an estimate of how some of the attributes of the average firm were distributed across the population of firms. The

definition of small and medium scale firms is based on SMEDAN (2014) categorization of firms into four different sizes along employment lines. Firms that employ between 10 – 49 workers are small firms, while those employing 50 - 199 workers are medium firms. In the study, 45.55% of the firms are micro, 41.97% are small, 9.75 are medium, and 2.73 are large. This shows that more of the firms in the study (87.52%) are micro and medium firms. For the study, only data on enterprises with between 10 and 199 workers were used for the analysis.

In estimating the equations of the model, there is evidence that training and productivity are endogenous (Bartel, 1994; Chhetri et al, 2019). This implies that while training may influence productivity, the level of productivity may also affect training conditions in a firm. In this case, the application of a pooled OLS technique in estimating Equations (5) and (6) will lead to a simultaneity bias (i.e., the training variable is correlated with the error term) which sample size cannot adjust for (Wooldridge, 2010). To address this econometric challenge, an instrumental variable-based generalized method of moments (GMM) estimation technique is used for the estimation. The instrumental variable employs an instrument for the endogenous variable in a two-stage procedure in order to avoid the simultaneity problem. In this case an instrument, which is correlated with training but uncorrelated with productivity, was selected. For the instrument, we use data on firms that train over 20 percent of workers instead of firms that provided training. Hence, the dummy variable becomes 1 for firms with over 20 percent training and zero for firms with less than 20 percent training. This variable was shown to be correlated with the initial training variable at 73.7 percent. In order to improve the robustness of the estimates, the Two Stage Least Squares (2SLS) technique (which is also an instrumental variable method) is also adopted.

EMPIRICAL ANALYSIS

Descriptive Statistics

The data used for the empirical analysis of the study are presented in Table 1. It shows that positive responses from firms with respect to experiencing productivity growth is high at 1.57 on average. Note that responses on productivity range between 1 (for no) and 2 (for Yes). Hence, a score of 1.57 implies that more of the SMEs in the study indicated increase in productivity over the past year. Moreover, an average of 15.73 percent of the firms have adopted and applied some form of technology, indicating that most of the SMEs have not fully keyed into the application of technology-based

activities within the firms. It can also be observed that 62.46 percent of small firms in the study agreed that they have conducted some form of training for their workers in the last year. This indicates that a substantial number of firms have adopted some form of training for staff in recent years. A larger proportion of the small firms indicated that they had provisions for R&D investment, while capacity utilisation is quite high at 70.62 percent on average for the SMEs.

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Obs
Productivity	1.57	0.50	1	2	2598
application of technology	15.73	1.80	9.61	27.23	12765
formal training	62.46	31.47	0	100	1561
capacity utilisation	70.62	20.52	15.1	90.8	5685
R&D	1.82	0.38	1	2	1955
age of firm	32.34	170.80	13	22	13031
access to finance	2.27	1.40	0	4	13516
manager's education	11.32	8.64	0	31	13514
education of worker	0.84	1.02	0	4	13701
Business environment	6.65	12.14	0	100	13025
level of technology	1.76	0.43	1	2	13031

Source: Authors' computation

Regression Analysis

In this section, the results of the cross-sectional data estimates of the specified models are reported and analysed. Note that the main (null) hypothesis for the study is that "workers' training has no significant impact on SMEs' productivity". The results presented in Table 2 show the estimates of the model that explains how workers' training influences productivity in the firms used in the study. In order to enhance robustness, the results were estimated using the GMM technique and the Two Stage Least Squares (2SLS) technique. It can be seen from the R-squared values and the other output of the two results that the estimates of the GMM provided better outcomes than those of the 2SLS results. The goodness of fit statistic for the GMM estimates is rather low and suggests that about 39 percent of the systematic variations in productivity among the selected firms was explained in the model. This outcome is to be expected since the data used for the estimations are cross-sectional (Iyoha,

2004; Wooldridge, 2010 for further explanation). The J-statistic for each of the equations also fails the significance test at the 5 percent level of significance, with probability values lying around the acceptable 0.1 region. This indicates that the null hypothesis that the over-identifying restrictions are equal to zero cannot be rejected. Apparently, the equations in the models along with the selected instruments, therefore, pass the identification tests. Consequently, the selected instruments in the specification are shown to be appropriate and consistent.

Table 2: Results for Training and Productivity

Variable	GMM			2SLS		
	Coef.	*z*	*P(z)*	*Coef.*	*z*	*P(z)*
Constant	0.037	0.1	0.92	0.552	1.83	0.07
Training	0.166	2.4	0.02	0.183	3.41	0.00
R&D	0.345	1.79	0.07	0.098	0.95	0.34
capacity utilization	0.008	2.05	0.04	0.007	1.74	0.08
firm age	0.001	1.53	0.13	0.0001	1.66	0.10
access to finance	0.041	2.26	0.02	0.035	2.01	0.04
management education	0.006	2.21	0.03	0.006	2.26	0.02
Workers' education	0.015	0.41	0.69	0.012	0.33	0.74
operating environment	0.003	3.23	0.00	0.003	3.15	0.00
R squared	0.392			0.271		
Wald stat	94.9[0.0]			66.01[0.0]		
J-stat	14.02[0.12]			13.68[0.11]		

Source: Authors' computations

From the results in Table 2, it can be seen that that the coefficient of training is positive and easily passes the significance test at the 5 percent level of significance (note that the probability of the z-value for the coefficient is 0.02 which is less than 5 percent). This indicates that training has a positive and significant impact on workers' productivity among the sampled firms. More training offered in the firms would, on average, result in higher productivity of the workers in the firm. Indeed, the coefficient of training in the productivity equation is high at 0.166, suggesting that training has a strong positive impact on the productivity of the workers. This coefficient is also close to the estimates for Belgian firms by Almeida and Carneiro (2009) and for a group of international firms by Konings and Vanormelingen (2015).

The other variable that relates to training is the level of R&D for workers among the firms. The coefficient is positive and slightly significant (at the 10 percent level of significance). This indicates that long term activities on development of human capital and other aspects of the firms actually have some sort of effects on current productivity among the sampled firms. However, the clear significance of the training coefficient shows that it is the present training systems and outcomes that exert the greater positive influences on current productivity among the sampled firms.

In the results also, capacity utilization had positive and significant impacts on productivity among the firms, indicating that greater efficiency of resource use tends to stimulate and improve productivity. As firms tend to improve their efficiency in the use of capacity and other inputs, overall labour productivity tends to rise within the firms. The coefficient of firm age fails the significance test, although it is positive. This indicates that age of firm does not tend to explain productivity, especially when training is taken into consideration. The coefficient of the degree of access to finance is positive and significant in the model, suggesting that greater access to finance promotes productivity among SMEs in Nigeria. The level of management education has a positive impact on productivity by the workers, as shown in the result. This means that better trained managers also tend to enhance productivity among small scale manufacturing firms in Nigeria. The positive impact of the operating environment on productivity is demonstrated by the positive coefficient of the environment variable. World Bank (2007) has noted that environmental influences tend to have adverse effects on enterprise development, especially the smaller businesses. For Nigeria, Adegboye, Alao-owunna and Egharevba (2018) also found similar results.

The impact of training on the application and efficiency of technology in small firms is also reported in Table 3. It should be noted that the dependent variable in this model also measures the level of vertical transfer of such technology within the firm or in terms of technology diffusion. The relevance of this estimation is based on the fact that technology use among small scale manufacturing firms, though critical for survival, is actually quite low among these firms (Adegboye & Iweriebor, 2018).

Table 3: Training and Use/Transfer of Technology

Variable	*GMM*			*2SLS*		
	Coef.	**Z**	**P>z**	**Coef.**	**Z**	**P>z**
Constant	16.0	7.71	0	13.6	6.55	0
capacity utilization	0.021	0.73	0.47	0.018	0.62	0.55
Training	0.048	2.44	0.02	0.041	2.07	0.04
R&D for workers	-0.092	-0.63	0.53	-0.078	-0.54	0.53
*training*tech*	0.027	2.93	0.00	-0.023	-2.49	0.01
Technology	1.184	1.99	0.05	-1.006	-1.69	0.07
Age	0.001	3.31	0.00	0.001	2.81	0.00
access to finance	-0.181	-1.2	0.23	-0.154	-1.02	0.26
management education	0.016	0.62	0.54	0.014	0.53	0.57
worker education	0.087	0.51	0.61	0.074	0.43	0.60
Environment	-0.009	-1.32	0.19	-0.007	-1.12	0.29
R-sqaured		0.264				
Wald test		0.024				
J-stat		9.91[0.10]			11.33[0.11]	

Source: Authors' computations

A close look at the individual coefficients of the explanatory variables in the model shows that the coefficient of training is positive and significant at the 5 percent level of significance. This shows that more training leads to capacity enhancement to adapt to new technology among the small firms. The coefficient of the interaction between training and availability of technology is significant and positive in the model. This indicates that training actually enhances technology use in the firms since the interaction variable is positive and significant. These results, therefore, demonstrate that training not only enhances productivity in a direct way, it also has an indirect impact through enhancement of technology use. These results are similar to those of Lyons (2020) and McKenzie and Puerto (2021). The coefficient of technology variable itself passed the significance test at the 5 percent level of significance. Thus, the results show that when training is conducted for the workers, there are better effects of technology and training on productivity of the firms in Nigeria. The other measure of training (through R&D) did not pass the test at the 5 percent level of significance and shows that research and development does not promote productivity when technology is involved. This result suggests that direct

training on the job may provide more beneficial outcomes for the SMEs in Nigeria.

CONCLUSION

In this study, the role of training in productivity growth among small enterprises in Nigeria was examined. The main argument in the study is that small enterprises that regularly train staff members would more generally adopt better production techniques, especially the use of technology, and enhance labour productivity. The data used in the study were obtained from the World Bank Enterprise Survey database for Nigeria in 2015 and the Generalised Method of Moments (GMM) modelling technique was used for the empirical analysis of the study. The overall result of the study revealed the relevance of training as a critical tool for stimulating productivity among small firms in Nigeria. Training was also found to be relevant in promoting technology application and overall technology diffusion among the sampled firms. In particular, it was found that more training offered in the firms actually resulted in higher productivity of the workers in the firms. The study also found that, although current training is crucial for expanding productivity, long term staff development investment (in the form of R&D) is also important for promoting productivity enhancement among small enterprises in Nigeria. In the same vein, enhancement of managerial training was also found to have positive impact on productivity in the firms, indicating that better trained managers tend to have rob-off effects on workers.

The study, however, highlights that the proportion of small enterprises that engage in workers' training is low in Nigeria (although the proportion appears to be rising over time). It is, therefore, recommended that there is the need for small businesses to expand training programmes for workers, not only at the recruitment level, but through the job processes. In particular, in-service training should be intensified among employees as a matter of right and due processes, rather than of privilege. In the same vein, training of newly recruited staff should be made mandatory as a policy for enterprises in Nigeria. Focus should be given to induction and orientation courses, which should be pursued vigorously, in view of their relevance to newly recruited employees. The issues of training content and dimensions were, however, not covered in this study. This is a veritable area where future research needs to be focused.

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