

The Effects of Apprenticeship System on Skill Development of Employees in the Printing Industry in Lagos State, Nigeria

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Abstract

This paper examines the contribution of apprenticeship system to skill development in the printing sector of the Nigerian economy. A descriptive research method (Structural Equation Model (AMOS 22)) was applied to analyse five hundred and sixty- four (564) copies of valid questionnaire completed by employees of printing establishments in ten major geographical locations within Lagos metropolis using stratified and simple random sampling techniques. The results obtained from the survey shows closed relationship between observed variables and also regression between the dependent and independent constructs of the study. The results from the survey indicates that apprenticeship system has positive significant impacts on employees' skill development in informal sector and in particular in printing industry. This suggests that training tools, on-the-job training, level of education, mentor-mentee relationships and observability, have significant effects on employee skill acquisition and development.

Key words: Apprenticeship, Skill Development, Training Tools, Mentoring, Observability, Printing, Level of Education

1.0 Introduction

Skill acquisition through formal or non-formal education is sine qua non for the social, cultural, political and most importantly, the economic development of any nation. In Nigeria, as in other African countries, most people have traditionally acquired their skills, knowledge and attitudes from institutions other than formal schools (Haan, 2006; ILO, 2008). Government through its education policy created opportunities for people to acquire basic education. The introduction of Universal Basic Education programme, turned into the labour market, a plethora of able-bodied young men and women without concrete and appropriate plans to ensure jobs for them (Lekan and Munta, 2008). Since governments by the federal, at various levels did not prepare for the influx of labour generated by different education policies, the free primary and secondary education of some states and the Universal Basic Education programme, the nation must be ready to face the consequences of inadequate preparation.

Obviously, the poor attention of government to the issue of unemployment and plights of the teeming population of young Nigerians propelled desirous parents and guardians who could not possibly sponsor their children and wards beyond secondary school level to resort to the non-formal system of education (Asaju, Arome and Anyio, 2014; Rao, 2014). Thus the apprenticeship system therefore became for such parents a tangible source of giving their children reasonable training and a means livelihood (Omole, 2004). Recalling the efforts made by government that proved inadequate, it is noteworthy mentioning the Structural Adjustment Programme (SAP) and the National Directorate of Employment (NDE)

programme, which were established by the Ibrahim Babangida's administration in Nigeria between 1985 and 1993. Unfortunately, neither of these programmes could conveniently solve the unemployment problems in the country. Also, since the euphoria of the oil boom subsidy, Nigeria has witnessed economic and employment challenges; unemployment became so alarming and job opportunities within the informal sector of the economy went completely out of the reach of all categories of school leavers, particularly primary and secondary school graduates.

The apprenticeship system and its skill development approach within the informal sector of the economy is seen to be the only saving grace embraced as observed earlier by many of the young school leavers whose parents could not train them beyond secondary school level (Walker 2011, Wright, 2003; Jamieson, 2000). Seeing the zeal and enthusiasm with which young school leavers in Lagos metropolis were trooping back to acquire skills in printing technology through the apprenticeship system, it becomes inevitable to take a look at the possible contributions of the apprenticeship system to skills and economic development in the printing industry. However, the importance of this study stemmed from its objectives, which are as follows:

- To examine how training tools can enhance apprentice lithographic skill in printing establishments.
- To evaluate the extent to which on-the-job training enhances apprentice in offset operation skill in the printing business.
- To examine whether apprentice level of education enriches apprentice screen printing skills.
- To determine the extent of mentoring on skills offer by apprenticeship system on packaging good in printing industry.
- To analyse the effect of observability on screen printing and packaging skills as an alternative strategy for human resource development.

1.2 Significance of the Study

This study will help in identifying the challenges associated with apprenticeship system and subsequently proffer suggestions that will help Planners, Administrators, Policy Makers and other Stakeholders take advantage of apprenticeship system to address the issue of youth unemployment in Nigeria.

2.0 Literature Review

2.1 The Apprenticeship System

Basically, apprenticeship involves a contractual relationship between a master craftsman and a trainee. The trainee is trained for prescribed work process by practical experience under the supervision of the master craftsman through formal instructions (Adeyeye, 2009; Omole, 2004). Apprenticeship scheme is the main avenue for skill and manpower development in the inform sector. It provides refuge for the unemployed in most African countries where they receive training and are engaged as quasi wage earning journeymen as the trainees learn on the job.

2.2 Apprenticeship in Printing Business

In printing business, as in other trades, the period of training and fee to be paid by the trainee are specified. The period of apprenticeship varies with areas of specialization. In some cases, particularly in highly sophisticated machine operation, longer periods are required before the apprentice can be fully initiated to practice as a master craftsman (Waite, 2006). In some, learning and apprenticeship last for life; the apprentice consults the master when faced with challenges in the course of his/her practice. Apparently, apprenticeship in the printing vocation connotes a platform which offers opportunity for on-the-job learning either as full apprentices or as journeymen who receive some stipends from the master craftsmen (Adeyeye, Aina, and Ige 2012; Worthington 1998).

In printing, apprenticeship training does not end with skill acquisition; it is also regarded as a part of a larger process of resourcing into the business (ILO, 2012; Ryan, 2000). The trainees are usually engaged as permanent employees on completion of their trainings. There is no age limit but the vocation is not the best for young men and women who are above forty years of age. Also, there is no stipulated level of educational attainment for entry into the business; however, the apprentice must be able to read and write simple English to understand and flow with the style and level of training. A young school leaver may be apprenticed without recourse to any labour law requirement; Parents and Guardians do apprentice their wards from the age of twelve (Adeyeye, 2009). In most cases written agreement are entered into by parties, which state the length of training, the fees and the mode of payment. The agreements are signed by the master craftsman, the parents or sponsors of the trainee and some witnesses. Disputes among the parties are settled without recourse to any legal tussle since agreements are usually made out of court. In case of default in the payment of training fees, the master can refuse to organise the “freedom ceremony” or issue any certificate to the apprentice on completion of the training. It is important to note that printing technology includes different aspects such as offset lithography, flexography and gravure. Therefore, training tools, on-the-job training, mentoring, and level of education as well as the ability of the apprentices to keenly observe the way his /her master carries out the printing business is essential for skill acquisition and development (ILO, 2012, Hasluck and Hogarth, 2008)

2.3 Training Tools and Skill Development

Printing machines or tools in the printing industry, which include machines such as offset printing machine, lithographic machine, automatic copy paper cutting and packing machine, color offset printing press, dual pad printer, bobst autoplatine, colors coating, Ryobi press 4 color 3304ha plate loaders and console-ab dick presstek, etc. are capital intensive. However, the availability of these machines will facilitate the learning process of the apprentices to acquire all kinds of skills needed in the printing establishments which include but not limited to lithographic, screen printing and offset skills (Temple, 2007; Jamieson, 2000; Wright, 2003). Sequel to the above, the researchers propose the following hypothesis:

H0₁: Training tools have no effect on apprentice lithographic and Offset Operation skills acquisition

2.4 On-the-job Training and Skill Acquisition

On-the-job training is a strategic determinant that facilitates learning of job related knowledge, skills, ability and behavior that are crucial for efficient apprentices' skill acquisition (Falola, Osibanjo and Ojo, 2014; Noe 2000, Derek & Hall, 2000). In the printing industry, on-the-job training is required to enhance apprentices' capabilities, reasoning faculty and competence on how to effectively acquire lithographic, flexography, gravure, xerography, inkjet and screen printing skills (Lynton and Pareek, 2000). It is affirmed that, on-the-job training increases apprentices' efficiencies, innovation, invention, capacity to accept new technologies and techniques (McNamara, 2008). Besides, Walker (2011) posited that on-the-job training presents a good opportunity to expand the knowledge base of all graphic and printing apprentices, and it will strengthen those skills that each apprentice needs to improve. It is also capable of building the apprentice confidence because they have a stronger understanding of the industry, and this confidence will push them to perform even better and think of new ideas that will help them to excel (Walker, 2011). It is on this platform that the researchers propose the following hypothesis:

H₀₂: On-the-job Training has no significant effect on apprentice lithographic and Offset Operation skills acquisition

2.5 Level of education

Apprentices with good basic education background are able to learn fast on the job and as well develop the knowledge and occupational competencies demanded by specific job roles (OECD, 2009; McGrath, 2002). Therefore, apprentice entering into printing business should have basic education to cope with the ever changing technology in the contemporary digital world. Basic education will provide the apprentice a platform to learning and practicing a new method and experimenting with the new materials and technology (Moodie, 2002; Tzannatos, and Johnes, 1997). For example offset lithography printing technology which is widely used for mass production is the process of transferring an inked impression from a plate to a rubber-covered cylinder to paper or other medium for the final printed product require basic education and technical ability to use machinery and advanced computer programme to run the press and all of its subsystems. Further to the literature reviewed above, the following hypothesis is hereby proposed:

H₀₃: Apprentice level of education has no significant influence on Offset Operation skill and screen printing skill acquisition

2.6 Mentoring and Skill Acquisition

Mentor-mentee relationship in the printing industry is a strategy that ensures high retention rate of apprentices; thus improving the rate of successfully completed apprenticeship. However, participating in a mentoring programme increases the chances of apprentices acquiring screen printing, packaging and lithographic skills among others from their mentors. Obviously, a good mentoring scheme will afford the apprentices the opportunity of learning and growing under the mentor's guidance; experimenting with creative solutions to problems solving within a safe and supportive environment and thus become

effective and efficient in the chosen area of specialization (Kutilek, & Earnest, 2001; Podsen, & Denmark, 2000; Mincemoyer, & Thomson, 1998). Therefore, the following hypothesis is proposed to test the relationships between mentoring and skill acquisition:

H0₄: Mentoring has no significant influence on apprentice screen printing and packaging skills acquisition

2.7 Observationality

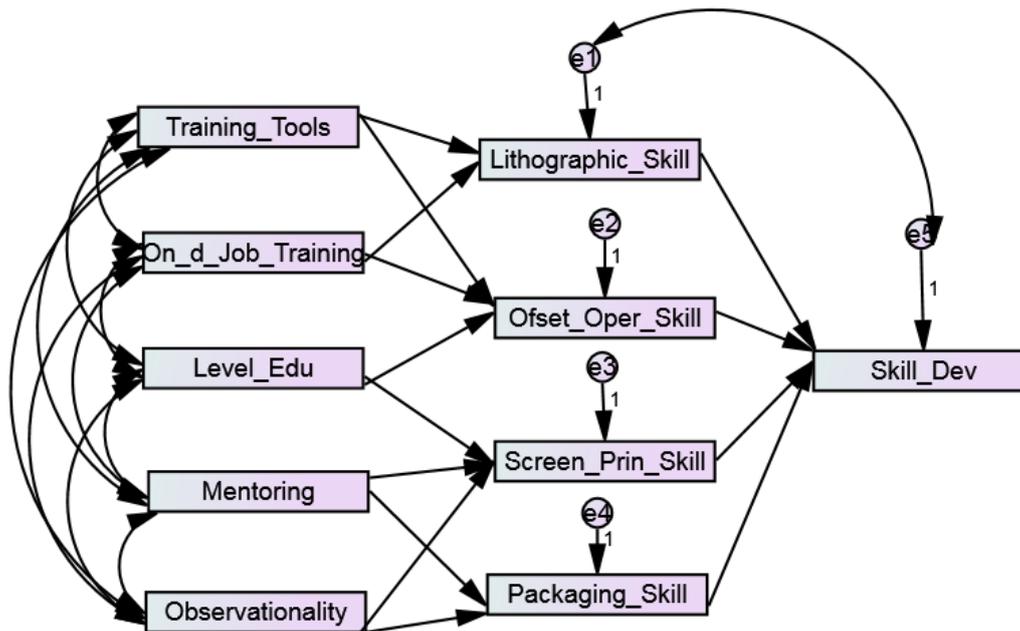
The apprentices are required to carefully observe the way and manner the master craftsman is performing a task as it relates to the printing business. Meanwhile, the master demonstrates the correct way of completing a task, and afterwards the apprentices are encouraged to attempt by imitating the master's skills, while being corrected for any mistakes (Uwameiye and Iyamu, 2002). Besides the apprentice's ability to pay very close and keen attention to the methods the master craftsman is performing a task, the apprentice will help in mastering the processes, procedures and skills involved in lithography, screen printing, offset printing and packaging among other skills in the printing business (Lekan and Munta, 2008). It is on this note that the researchers would like to propose the following hypothesis:

H0₅: Observationality has no significant effect on apprentice screen printing and packaging skills acquisition

3.1 Research Model

This study focuses on the apprenticeship system and skill development in the printing industry in Lagos metropolis. However, as obtained in the literature reviewed, we propose the research model depicted in figure 1.

Figure 1: Proposed Study Model



Source: researchers (2015)

The model encompasses endogenous variables such as lithographic, offset operation, screen printing and packaging skills; while the exogenous variables include training tools, on-the-job training and level of education of the apprentices as well as mentor-mentee relationships and observability. The observed endogenous and exogenous variables are integrated in the model to establish whether specific paths are significant.

3.2 Methodology

The descriptive survey research design was adopted for this study. The scope of the study was Lagos metropolis where many printing companies are situated. Lagos metropolis was divided into four (4) zones - zone A is made up of Somolu, Mushin, and Ilupeju areas; zone B is made up of Ikeja, Agege and Ogba; zone C is made up of Apapa, Ebute-Meta and Yaba; while zone D is made up of Lagos Island, Eti-Osa and Ido. For the study, one area each noted for high concentration of printing activities was purposively selected. The areas selected for this study are Somolu for zone A, Ikeja for zone B, Apapa for zone C and Lagos Island for zone D. The population covered by this study was one thousand, three hundred and seventy (1370) apprentices comprising those that had completed their apprenticeship training and those still undergoing on-the-job training but had spent two (2) years and above as apprentices. The stratified and simple random sampling techniques were used to select 700 respondents. The major instrument for the data collection was a set of structured questionnaire which was complemented with the use of oral interview, observations and consultation of relevant documents in the selected printing companies in the zones. Out of seven hundred (700) copies of structured questionnaire administered to the respondents in the selected zones, five hundred and sixty four (564) copies were valid and adjudged suitable for this study, which translates to 81% response rate. Meanwhile, Five-point Likert scale was used in the design

of the questionnaire. The responses obtained were subjected to analyses with the use of Statistical Package for Social Sciences (SPSS) AMOS 22, and the adoption of Structural Equation Modeling (SEM) to determine the level of correlation between observed variables and regression between the endogenous and exogenous constructs. For refinement of scale, Confirmatory Factor Analysis (CFA) in which the Non-factor Index (NFI), Confirmatory Factor Index (CFI), Standardized Root Mean Square Error (SRME), Root Mean Square Error of Approximation (RMSEA), and the degree of freedom (df) were used to determine the level of fit among the items on the hypothesized constructs, the degree of internal consistency and overall relationship among the items comprising the scales. The reliability of the factors was estimated by assessing the internal stability of the scales by means of Cronbach's alpha.

3.3 RESEARCH RESULTS

Respondents Profiles

The table below describes the statistical analysis of respondents' profiles in the form of frequency and percentage.

Table 1: Respondents' Demographic Profiles

			Percentage (N=564)
Gender:	Male	341	60
	Female	223	40
Age:	21 – 30 years	273	48
	31 – 40 years	198	35
	41 – 50 years	93	17
	50 years & above	00	0
Marital Status:	Single	373	66
	Married	191	34
Educational Qualification:	Pry	198	35
	SSCE	251	45
	ND/NCE	98	17
	B.SC/HND	17	3
Length of Learning	0 – 1 year	91	16
	1– 2 years	103	19
	2– 3years	186	33
	3 – 4 years	154	27
	Above 4 years	30	5

Source: Field Survey, 2015

The demographic profiles in table 1 above, show that 341 (60%) of the total respondents represent male population and 223 females representing 40%. This means that printing business is dominated by male personeel in the selected areas. While, about 93% cumulative of the respondents were within an economically active population, 373 representing (66%) of the respondents were single and 191 representing (34%) were married, though the reasons for their present marital status could not be ascertained as at the time of documenting this report. Furthermore, 198 representing (35%) of the respondents had First school Leaving Certificate, 251 representing (45%) had SSCE, 98 (17%) had National Diploma/NCE while only 17 representing (3%) had B.Sc/HND certificates. Regarding the length of learning on the job, 91 representing (16%) of the respondents had spent between 0 and 1 year; 103 (19%) had spent between 1-2 years while 186 representing (33%) had put in between 2-3 years; 154 (27%) had spent between 3-4 years and 30 respondents representing (5%) had spent 5 years and above learning on the job. However, going by the years the respondents had spent on learning the printing skills, we concluded that respondents understood the questionnaire and their true feelings.

Table 2: Parameter Estimation (Regression Weight) for Modified Model

			Estimate	S.E.	C.R.	P	Label
Lithographic_Skill	<---	Training_Tools	.066	.020	4.750	***	Significant
Lithographic_Skill	<---	On_d_Job_Training	.040	.012	3.760	***	Significant
Ofset_Oper_Skill	<---	On_d_Job_Training	.075	.026	1.790	.073	Significant
Ofset_Oper_Skill	<---	Level_Edu	.160	.031	3.794	***	Significant
Screen Prin_Skill	<---	Mentoring	.014	.041	.315	.753	Significant
Packaging_Skill	<---	Observationality	.107	.031	2.549	.011	Significant
Screen Prin_Skill	<---	Observationality	.074	.033	1.495	.135	Significant
Screen Prin_Skill	<---	Level_Edu	.132	.037	2.668	.008	Significant
Ofset_Oper_Skill	<---	Training_Tools	.071	.034	1.688	.091	Significant
Packaging_Skill	<---	Mentoring	.194	.044	4.625	***	Significant

Note: C.R. = Critical Ratio; S.E. = Standard Error; * significant at 0.05

Further to table 2 presented above, the level of correlations that exists between observed variables can be classified as strong or low. The null hypothesis is the hypothesized model in which the parameters were set up to indicate whether a path should exist between variables or not. It is important to note that, where p-value (0.001) is less than the significance level (0.05), the null-hypothesis should be rejected. The covariance lithographic skill and training tolls is positive and estimated to be $r=.066$ ($p<0.001$). However, lithographic skill as a variable co-varies positively with on-the-job training at ($r=.040$, $p<0.001$). Meanwhile, the relationship between offset operating skill and on-the-job training is positive and estimated to be $r=.075$ ($p<0.001$); while the relationships between offset operating skill and apprentice level of education is also positive at ($r=.160$, $p<0.001$); and training tools ($r=.071$, $p<0.001$). Similarly, there was a positive relationship between screen printing skill and other variables such as mentoring ($r=.014$, $p<0.001$); observationality ($r=.074$, $p<0.001$) and apprentice level of education ($r=.132$, $p<0.001$). Besides, the covariance between packaging skill and other variables such as observationality (r

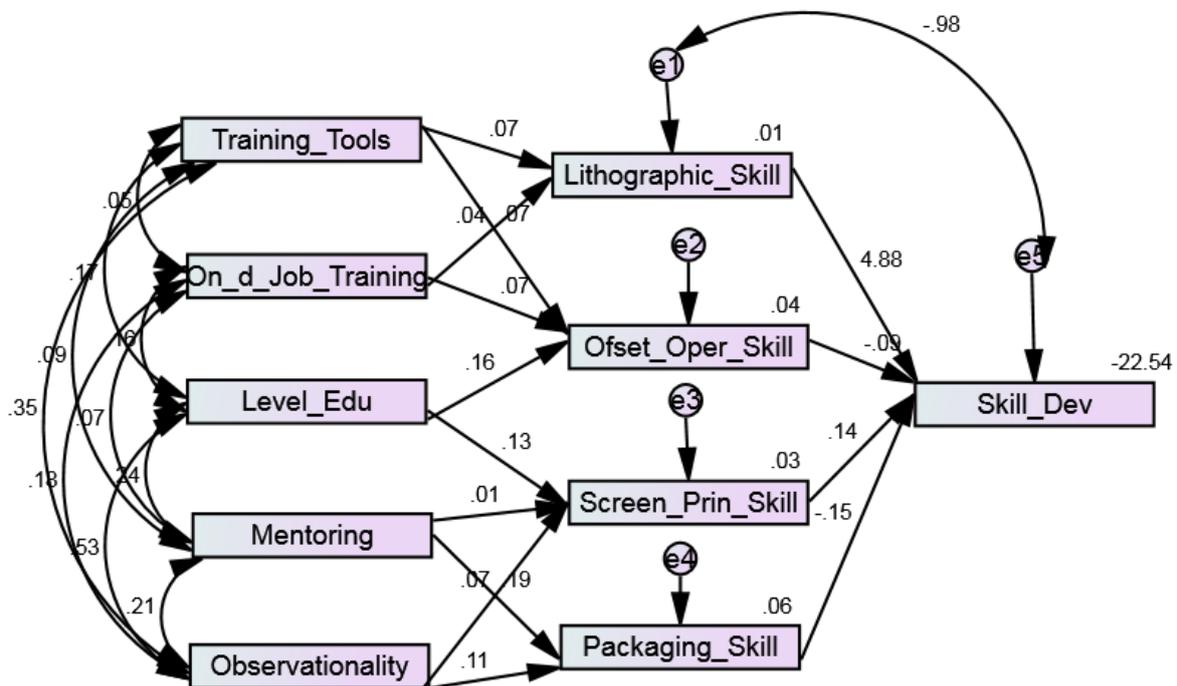
= .107, $p < 0.05$) and mentoring ($r = .194$, $p < 0.05$) is positive. However, the table below summarizes the results of the research hypotheses.

Table 3: Summary of Research Hypotheses Results

Research Hypothesis	Results
H0 ₁ : Training tools have no effect on apprentice lithographic and Offset Operation skills acquisition	H ₀ Reject
H0 ₂ : On-the-job Training has no significant effect on apprentice lithographic and Offset Operation skills acquisition	H ₀ Reject
H0 ₃ : Apprentice level of education has no significant influence on Offset Operation skill and screen printing skill acquisition	H ₀ Reject
H0 ₄ : Mentoring has no significant influence on apprentice screen printing and packaging skills acquisition	H ₀ Reject
H0 ₅ : Observationality has no significant effect on apprentice screen printing and packaging skills acquisition	H ₀ Reject

3.4 Model Testing

Figure 2: Results of the Structural Model of Data Collected



Source: Field Survey, 2015

The researchers used the Structural Equation Modeling AMOS (Analysis of Moment Structure) path analysis version 22.0. The programme was adopted to determine the level of fitness between the exogenous (independent) and endogenous (dependent) variables. Model fit indices such as Comparative Fit Index (CFI), Normed Fit Index (NFI), Relative Fix Index (RFI), Incremental Fix Index (IFI), Root Mean Square Error of Approximation (RMSEA) and CMIN indicated acceptable and good fit. As noted by Awang (2012); Tabachinck and Fidell, (2007); Kenny, and McCoach, (2003); Hu and Bentlar, (1999) and Bentler and Bonett (1980), acceptable criteria of SEM path structure are presented in the table below:

Table 4: Criteria of SEM Path Structure

Criteria	Characteristics
Unidimensionality	When factor loadings is more than 0.5.
Validity	Convergent validity <ul style="list-style-type: none"> • AVE value is more than 0.5 Construct validity <ul style="list-style-type: none"> • Fitness index Chisq $p > 0.05$ RMSEA < 0.80 GFI > 0.90 AGFI > 0.90 CFI > 0.90 TLI < 0.90 Chisq/df < 5.0 Discriminant validity <ul style="list-style-type: none"> □□ Correlation between variables
Reliability	Internal reliability <ul style="list-style-type: none"> □□ Cronbach's alpha > 0.7 Construct reliability <ul style="list-style-type: none"> □□ CR value > 0.6 Average Variance Extracted <ul style="list-style-type: none"> □□ AVE > 0.5

However, the result obtained shows that all the fits indices are above the minimum acceptable value indicating a good fit. The summary of the fitness is presented in the table below:

Table 5: Fitness Index Measurement

Fit Indices	Benchmark	Value	Results
Chisq	$p > 0.05$	278.786	Achieved
RMSEA	< 0.80	.049	Achieved
GFI	> 0.90	.944	Achieved
AGFI	> 0.90	.945	Achieved
CFI	> 0.90	.958	Achieved
TLI	> 0.90	.956	Achieved

Source: Field Survey, 2015

Further to the result of the structural model depicted in figure 2, the model result show the regression between Training tools (Training_Tools); on-the-job training (on_d_job_Training) level of education

(Level_edu); mentoring; and observability on skill development. Besides, all the variables tested under independent construct have positive path coefficients as factors that tend to enhance skill development. However, the path coefficient scores (regression weights) of the observed constructs explain the regression between the studied variables. The regression weight between training tools and lithographic skill is .066 ($p < 0.001$) which indicate that when **Training_Tools** goes up by 1 standard deviation, **lithographic skill** goes up by 0.066 standard deviations; meanwhile, the regression weight for training tools in the prediction of apprentice acquisition of lithographic skills is significantly different from zero at the 0.001 level. The implication is that investment in training tools will improve skill acquisition. In a related development, the effect of on-the-job training on lithographic skill was posited with the path coefficient of 0.04 ($p < 0.001$); therefore, when **on_d_job_training** goes up by 1 standard deviation, **lithographic_skill** goes up by 0.04 standard deviations.

Meanwhile, the effect of on-the-job-training on offset operating skill is positive with the regression weight of .075 ($p < 0.001$); therefore, when **On_d_Job_Training** goes up by 1 standard deviation, **offset_oper_skill** goes up by 0.075 standard deviations. The regression weight for on-the-job training in the prediction of apprentice offset operation skill is significantly different from zero at the 0.001 level. Furthermore, it is important to state that the apprentice level of education has a strong relationship with variables such as offset operating skill and screen printing and their effect is positive with coefficient values of .160 ($p < 0.05$) and .132 ($p < 0.05$) in that order. Evidently, when level of education goes up by 1, offset operating skill goes up by 0.160 and screening printing goes up by 0.132; in other words, the regression weight for offset operating skill and screen printing skill in the prediction of apprentice skill acquisition is significantly different from zero at the 0.001 level.

In another development, the effect of mentoring on screen printing and packaging skills are positive with the regression weights of .014 ($p < 0.001$) and .194 ($p < 0.001$) respectively. When mentoring goes up by 1 standard deviation, apprentice screen printing and packaging skills goes up by 0.014 and 0.194 standard deviations respectively. The regression weight for mentoring in the prediction of apprentice screen printing and packing skills are significantly different from zero at the 0.001 level respectively. In another development, the effect of observability on screen printing and packaging skills are positive with the regression weights of .074 ($p < 0.001$) and .107 ($p < 0.001$) respectively. Therefore, when observability goes up by 1 standard deviation, screen printing skill and packaging skill goes up by 0.074 and 0,107 in that order. Further results of the SEM analysis show the correlation between the independent variables (training_tool, on_d_job_training, level of edu, mentoring and observability); thus the results show the close association that exists between the tested independent variables.

Conclusion

This study provides insight into the significance of apprenticeship system and skill development in the informal sector of Nigeria's economy in general and the printing industry in particular. Apprenticeship system remains a potential source of employment opportunity for young men and women who are interested in the printing business. Training tools, on-the-job training, level of education, mentoring and observability will have positive effect on apprentices' lithographic, offset operation, screen printing

and packaging skills. Therefore, the more apprentices develop their skills, the more their performance will be enhanced. This study will assist stakeholders in the printing business to fully understand the effects of apprenticeship system (training tools, on-the-job training, level of education, mentoring and observationality) on apprentice skill acquisition (lithographic, offset operation, screen printing and packaging skills). The study will further assist policy makers and other stakeholders in printing business to understand the significant relationship that exists between the apprenticeship system and skill development. Thus the study has made cogent and important contribution towards the improvement of the apprenticeship system in Nigeria printing industry.

Finally, the researchers strongly recommend that Government at all levels should as a matter of urgency reorganize, revisit and adequately fund all institutions of informal training, particularly the National Directorate of Employment (NDE). Thus NDE and other training centres will be empowered to effectively reorganize the apprenticeship systems for the benefit of Nigeria's teeming population of young men and women.

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