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**APPRENTICESHIP AND WORKSHOPS AS TRAINING AVENUES
TOWARDS IMPROVING PERFORMANCE OF SMALL MINING
BUSINESSES IN NASARAWA STATE**

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Abstract

The study was concerned with the measurement of the effect of Apprenticeship and Workshops, as training modes, on the performance of small mining businesses in Nasarawa State through an increase in owner-manager competence. To achieve this, a causal design was adopted by the study, premised on the Human Capital Theory and relying on quantitative methods, including the collection of survey data from a sample of 298 small mining operators across the state. In analysing the collected data, as well as testing model hypotheses, the Partial Least Squares Structural Equation Modelling (PLS-SEM) approach to path analysis was employed. Findings indicated that while Apprenticeship was positive and statistically significant in determining Performance, the effect exerted by Workshops was not statistically different from zero. Based on this, it was therefore recommended that government and other stakeholders prioritise collaboration with business owners in enhancing apprenticeship programmes where participants receive relevant, hands-on training that meets the specific needs of the mining sector. Furthermore, it is crucial that workshops, as a training mode, be reassessed in terms of content and delivery methods, based on participant feedback to ensure relevance to the challenges faced by small mining enterprises. Addressing identified shortcomings and integrating practical training opportunities can enhance the effectiveness of these workshops by allowing participants to apply theoretical knowledge in real-world contexts.

Keywords: Apprenticeship, workshop, training, mining, Nasarawa.

Introduction

Small businesses division has a significant role in the economic development of most countries of the world and is, notably, vital for profit generation. This contribution can bring about a surge of improvement in the way of living and create employment (Johnson-Hart, 2023). Small mining businesses in Nasarawa State are vital to the local economy, leveraging the region's rich mineral resources to create jobs and stimulate economic growth. However, these businesses continue to grapple with challenges within their operating environment that negatively affect their ability to optimise performance and remain competitive in an increasingly demanding market. Nasarawa State, often referred to as the "Home of Solid Minerals," boasts significant potential in the area of solid mineral resources. It is documented that the state is rich in some of the largest deposits of valuable solid minerals, such as cooking coal, barite, lead, zinc, and lithium. Additionally, it is home to many active companies involved in the development of solid minerals. This presents immense potential for viable business opportunities in the sector. However, the industry remains somewhat stagnant in terms of business performance, with a very low level of commercialisation and business growth (Ukumba, 2022).

Entrepreneurship training has often been put forward as a potent tool for business operators to run and expand their enterprises. As a key ingredient for enhancing small business performance, training is highlighted by Lewrick (2015) to promote desirable skills such as innovativeness, risk-taking, opportunity identification and business management. The technical knowledge and skills training provided are crucial for entrepreneurs in effectively performing their role and meeting business objectives (Fizel & Itri, 2014). In this regard, training programs have emerged as a potential solution to enhance the capabilities and competencies of small business owners and operators. Training provides benefits for start-ups, expansion of the already existing business and it is as well useful throughout the lifecycle of a business (Abdul, 2018).

Forms of entrepreneurial training such as apprenticeships and workshops (Ladzani & van Vuuren, 2017) are, therefore, crucial and useful in attaining this. Apprenticeships offer hands-on training and skill development, enabling individuals to gain practical experience while contributing to the productivity of their employers. Workshops, on the other hand, provide a platform for knowledge sharing and capacity building, facilitating the exchange of best practices and innovative approaches within the industry. This research seeks to explore how these training avenues can effectively address the skills gap and operational challenges faced by small mining enterprises in Nasarawa State. By examining the impact of structured apprenticeship programs and targeted workshops, this study aims to contribute to the development of sustainable practices that not only improve business performance but also foster a more robust mining sector in the region.

Specifically, the study aimed to

- i. Determine the effect of apprenticeship on the performance of small mining businesses in Nasarawa State.
- ii. determine the effect of workshops on the performance of small mining businesses in Nasarawa State.

To meet these objectives, the following hypotheses were tested.

H₀₁: Apprenticeship does not have a significant effect on the performance of small mining businesses in Nasarawa State.

H₀₂: Workshops do not have a significant effect on the performance of small mining businesses in Nasarawa State.

Apprenticeship

Apprenticeship programs offer an avenue for entrepreneurship training. Apprenticeships involve a structured training arrangement where a novice, or apprentice, works alongside an experienced professional in the mining industry. Through hands-on experience, apprentices acquire practical skills, learn industry-specific techniques, and gain a deeper understanding of mining operations. This form of training enables small mining business owners to enhance their technical expertise and improve overall performance in their operations (Agbionu et al., 2018). Most of the training under apprenticeships is done through observing and/or working for the trainer (who is a master of the craft), who helps the apprentice learn their trade or profession, in exchange for their continued labour for an agreed period after they have achieved measurable competencies (Okafor & Akinwale, 2016).

There are basically two types of apprenticeship: Formal and Informal apprenticeship. The former, as explained by Okafor and Akinwale (2016), is a learning process which transits from the classroom to real practical situations in the workplace in the industry. Learning experiences acquired in the classroom are transferred to the real work situation. Programmes where formal apprenticeship is practiced include internships and on-the-job training schemes (Ayinde, 2018). Informal apprenticeship, on the other hand, as described by Orjinta (2017), involves close interaction between the learner and the master, whereby the apprentice learns the skills of the trade by observing his master perform the job. No theory is taught, the facilities in which the training is done are ill-equipped and no training syllabus used. Informal apprenticeship systems are widespread in many countries and are considered the most important source of skills training in Africa and South Asia. As put by (ILO, 2011), informal apprenticeship is a socially accepted practice for transmitting skills from one generation to the next. Hence, at their workplaces, apprentices not only learn relevant technical skills but are also introduced to a business culture and a business network (ILO, 2011). Familiarity with these environments increases their chances of employment once the apprenticeship is complete (ILO, 2011).

Workshops

Workshops are presentation-form training events designed for a wide audience (Al-Mzary et al., 2015). Here, a group of individuals is trained on a particular issue all at the same time. Workshops are traditional forms of training that can bring together small mining business owners and industry experts to share knowledge, best practices, and insights. These events provide opportunities for interactive learning, networking, and exposure to new ideas and innovations. By attending workshops and seminars, small mining business owners can enhance their knowledge, gain industry-specific insights, and improve their business performance through the application of new strategies and techniques (Nassary, 2020).

Business Performance

The performance of small businesses has to do with how well the management of the enterprise manages its resources. In other words, it has to do with how well a business enterprise is managed and the value such an enterprise offers to its customers and other stakeholders. Performance of small businesses in this study focused on an increase in profit, increase in productivity, increase in size of the firm (increase in market share), increase in sales and increase in number of workers. Muslimu and Alhassan (2020) affirmed that entrepreneurship training, if adequately acquired and properly applied, could improve the performance of a business. According to Eniola and Entebang (2015), performance is commonly employed as an index of a firm's health over a dedicated period. This puts performance as one of the key issues of small businesses.

Empirical Review

Apprenticeship and Business Performance

In a study carried out in Anambra State, Iwueke et al. (2020) examined the effect of apprenticeship training on performance. Analysis of primary data collected from a cross-section of trades/crafts/businesses indicated a positive and statistically significant effect of apprenticeship on performance due to increased competency. Aka (2015), in a related study conducted in Ebonyi State among micro businesses based on a correlational research design, also found that apprenticeship was positively and significantly associated with performance. Primary data were collected and analysed from 301 firms in the state. Furthermore, Charity et al. (2019) confirmed the positive and significant effect of apprenticeship on performance, through both formal and informal avenues.

Training Workshops and Business Performance

Scholarstica et al. (2022) explored the role of training workshops on the performance of Igbo traders in Anambra State. Ordinary Least Squares (OLS) regression was applied to primary data collected from a sample of 482 respondents in the state. Findings from the results indicated that workshops, as a form of training, were positive and statistically significant in determining performance among businesses in the study area. In their study among graduates in Malaysia, Mahmood et al. (2020) also found business performance to be a positive outcome of training workshops after estimating a multiple regression model with self-reported survey data collected from a sample of 250 graduates engaged in various businesses.

Similarly, in an empirical study carried out in Indonesia, Rakib et al. (2020) determined the effect of entrepreneurial training on business performance in the City of Parepare. Partial Least Squares Structural Equation Modelling (PLS-SEM) was carried out using primary data from 150 small-scale entrepreneurs who had received entrepreneurship assistance and training in the city. It was found that training workshops were influential in predicting higher levels of business performance. In the same vein, Nnabugwu and Gladys (2019) found workshops to positively and significantly predict performance from an analysis of primary data gathered from 310 business owners in Enugu State.

Conceptual Framework

The conceptual framework of the study, as guided by empirical review, establishes performance as an outcome of workshops and apprenticeship, as important components of entrepreneurial training (see Figure 1)

Figure 1

Conceptual Framework of the Study

Note. Researcher's Compilation.

Theoretical Framework

Human Capital Theory

The study is predicated on the Human Capital theory. The theory, pioneered by Adam Smith and subsequently popularised by Greg Becker, emphasises investment in people as a means of improving competency through training and education. The theory views competency as a resource businesses require to effectively function and extends the need for investing in the physical aspects of the business, such as machinery and technology, to include an equally important investment in human

capital in terms of training as a way of improving productivity and efficiency (Health Assured, 2024). The study repurposes the theory to frame the investigation into how apprenticeships and workshops contribute to skill development and knowledge acquisition among entrepreneurs of small mining businesses in Nasarawa State. By focusing on the value of training as an investment in human resources, the study can explore the relationship between enhanced skills and improved operational efficiency, productivity, and overall business performance in the mining sector. Furthermore, this theory can support the examination of the long-term benefits of such training initiatives in the larger picture of the implications of such initiatives on innovation and competitiveness within the industry. By applying Human Capital Theory, the research can provide a comprehensive understanding of how effective training avenues can transform small mining businesses in Nasarawa State.

Methodology

The causal design was adopted by the study in line with the study direction and its specific objectives. Primary data were, therefore, collected individually on all variable constructs using associated measurement scales, and path relationships between the exogenous constructs and the endogenous construct were estimated. The data used were primary in nature, obtained from a questionnaire survey involving the administration of a structured questionnaire to a cross-section of 326 small mining business owners across selected Local Government Areas of Akwanga, Karu, Keffi, Kokona and Nasarawa, being a number drawn from a total population of 1133, as provided by the Miners Association of Nasarawa State (2022). This sample number represented the necessary sample size, determined with the Yamane (1967) sample determination formula inflated by 10% to account for non-response.

Respondent selection was done through multistage sampling involving a combination of purposive and stratified random sampling, with the LGAs featured as strata. The instrument, designed as closed-ended, with construct measurement scales formatted based on the 5-point Likert scale response framework, was subjected to validity (through face and content analysis), as well as reliability tests to confirm accuracy. The latter was achieved using the popular Cronbach's Alpha computed on pretest results obtained from a preliminary sample of 30 respondents selected from LGAs in Kaduna State. Satisfactory validity and Cronbach's Alpha results were obtained, with necessary corrections done, including adjustments of questionnaire items, as well as removal of problematic ones, where appropriate.

Results and Discussions

The analysis of the obtained survey data was done based on a retained sample of 298 from the total of 326 administered questionnaire copies. This was a satisfactory number, as it exceeded the necessary computed sample size of 296 computed using the Yamane formula. The survey data obtained indicated that most of the respondents were male (71.2%), married (67.6%) and had been in business for more than 7 years (41.2%). Collected survey data generally pointed to a low level of apprenticeship and workshop training among surveyed businesses.

In analysing the collected data, PLS-SEM was employed in two main stages. The first was the assessment of the measurement model involving reliability and validity tests. Here, firstly, indicator reliability was tested via an evaluation of loading values. Loadings below 0.708 were discarded, as recommended by Hair et al. (2019), as can be seen in Table 1, in the removal of AS1, AS3, WS3, WS4 and PF4. All retained indicators were confirmed to be reliable based on this criterion.

Table 1

Reliability and Convergent Validity of Measurement Model

Construct	Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Apprenticeship		0.865	0.904	0.658

AS2	0.745			
AS4	0.746			
AS5	0.915			
<i>Workshops</i>				
WS1	0.932	0.866	0.874	0.882
WS2	0.936			
WS5	0.912			
<i>Performance</i>		0.880	0.913	0.679
PF1	0.867			
PF2	0.852			
PF3	0.782			
PF5	0.726			

Note. SmartPLS Output.

In addition to indicator reliability, internal consistency reliability was also determined using Cronbach's Alpha and Composite reliability. In both cases, all constructs were found to be reliable given computed values greater than 0.7. Convergent validity was assessed through AVE values based on a 0.5 threshold recommended by Hair et al. (2019). Validity in this regard was confirmed based on the fact that all computed AVE values met this criterion.

Discriminant validity was the second form of validity determined for measurement model constructs aimed at determining the uniqueness of indicators in measuring their underlying constructs. This was achieved with Heterotrait-Monotrait (HTMT) ratios. HTMT ratios are generally required to be less than 0.9 (Henseler et al., 2015). As depicted in Table 2, all HTMT values were confirmed to satisfy this criterion.

Table 2

Heterotrait-Monotrait (HTMT) Ratio

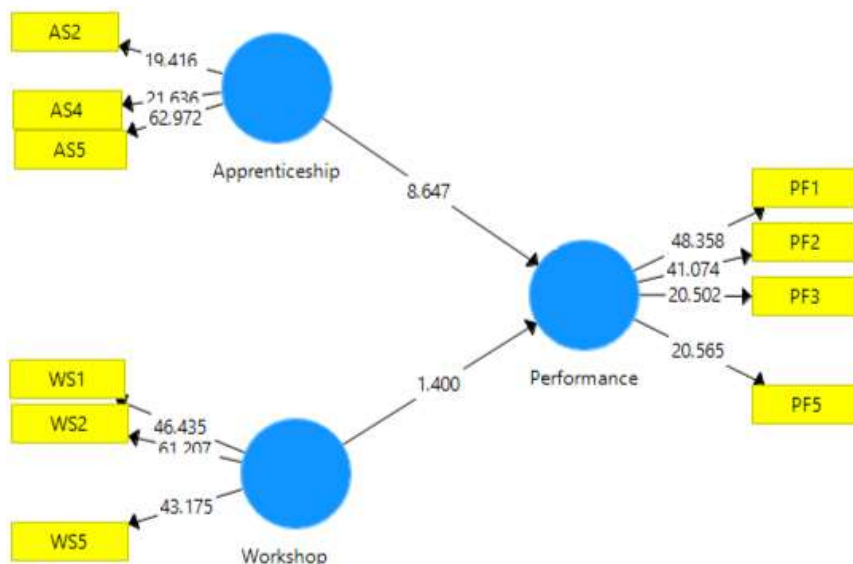
	Performance	Apprenticeship
Apprenticeship	0.601	
Workshop	0.368	0.551

Note. SmartPLS Output.

The confirmation of the accuracy of the measurement model was followed by structural model estimation carried out in a bootstrapping process involving 5,000 subsamples. Figure 2 presents the estimated model for the study, with exogenous constructs of Apprenticeship and Workshops predicting the endogenous construct of performance.

Figure 2

Estimated Path Model of the Study



Note. SmartPLS Output.

To ensure that the accuracy of the inner model, however, test of collinearity among constructs in the inner model was carried out using Variance Inflation Factor (VIF) statistics as can be seen in the information provided in table 3.

Table 3
Variance Inflation Values (VIF) (Inner Model)

Construct	VIF
Apprenticeship	1.181
Workshop and Seminar	1.740

Note. SmartPLS Output.

Estimated values of less than 5 for all constructs confirmed that collinearity was not a problem in the model, based on the rule of thumb established by Ringle et al. (2019). In-sample explanatory power was also estimated for the path model with the Coefficient of Multiple Determination (R^2). (see table 4). The estimated value of 0.703 (using adjusted R^2) indicated that about 70% of changes in performance are attributable to changes Apprenticeship and Workshop training modes, thereby upholding high predictive power of the estimated model, as well as high level of accuracy in model specification.

Table 4
In-Sample Predictive Power of Estimated Model

	R Square	R Square Adjusted
Performance	0.705	0.703

Note. SmartPLS Output.

Estimated path model coefficients are provided in Table 5. The bootstrapping process carried out provided pertinent t and p values required for carrying out tests for the hypotheses formulated for the study.

Table 5
Estimated Path Coefficients and Hypothesis Testing

	β	Std Dev.	t	p value	P < 0.05?
Apprenticeship -> Performance	0.415	0.048	8.647	0.000	Yes
Workshops -> Performance	0.094	0.067	1.400	0.162	No

Note. Extracted from SmartPLS Output.

As can be seen from Table 5, Apprenticeship was estimated to have a positive and significant effect on performance (0.415, $t = 8.647$, $p < 0.05$) among small mining businesses in Nasarawa State. On the other hand, the effect of Workshops as a training form was found not to have a statistically significant effect on performance (0.094, $t = 1.4$, $p > 0.05$), indicating that training Workshops, in their present form were not effective in predicting performance among these businesses

Conclusion and Recommendations

The study aimed at an empirical investigation of the effect of Apprenticeship and Workshops, as important forms of training, on the performance of small mining businesses in Nasarawa State, which have been characterised by low performance levels over the years. It was found by the study that Apprenticeship was instrumental in bringing about superior performance among these businesses. Thus, stakeholders, including government agencies, mining associations, and business owners, should collaborate to enhance these programs by developing structured curricula in partnership with vocational schools and training institutions. This approach ensures that apprentices receive relevant, hands-on training that meets the specific needs of the mining sector.

Although training workshops did not show a statistically significant effect on performance, it remains important to reassess their content and delivery methods. Stakeholders should gather feedback from participants to identify areas for improvement, ensuring that workshop topics are relevant and aligned with the challenges faced by small mining enterprises. By addressing any shortcomings, workshops can become more effective in fostering knowledge and skill development. Moreover, integrating workshops with practical training opportunities can greatly enhance their effectiveness. By combining theoretical knowledge with hands-on experiences, participants can immediately apply what they learn in a real-world context, bridging the gap between theory and practice. This integrated approach will help ensure that the skills and knowledge gained during workshops are relevant to daily operations.

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