Supplier Development and Product Performance of Oil and Gas Services Firms in Rivers State

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Abstract
The study focused on the link between supplier development and product performance of oil and gas services companies in Rivers State, Nigeria. In particular, it examined how supplier training and financial support affect the product quality conformance and defects rate. The survey research design was used and data gathered from 168 valid respondents using a structured questionnaire. Data analysis was carried out using Spearman's Rank Order Correlation. The results showed strong positive relationships with product quality conformance (r = 0.982) and defect rate (r = 0.851) with the supplier training. In the same way, financial assistance was positively associated with product quality conformance (r = 0.773), and defect rate (r = 0.884). The study found that supplier development is a key determinant in improving product performance, and it suggested frequent training of suppliers, financial support and continuous assessment of suppliers.

Keywords: *Supplier Development, Product Quality Performance, Training, Financial Assistance, Product Quality Conformance, Defect Rate*

1. Introduction

The oil and gas industry remain a pivotal force in the global economy, fueling industries, employment, national income, powering transportation, and influencing geopolitics. Despite advances in renewable energy and growing concerns over environmental sustainability, oil and gas continue to meet a substantial share of the world's energy demand. However, the industry is increasingly challenged by mounting operational complexities (Nwankwo, 2021). As exploration and production become more technically demanding and geographically dispersed, oil and gas companies are turning to specialized service providers to support their operations. This reliance on third-party expertise makes supplier development a central focus of performance especially in ensuring cost control, quality assurance and timely delivery. Nigeria, as one of Africa's leading oil-producing nations, mirrors their global dynamics while facing its own set of challenges.

Supplier development has become a critical strategic practice in modern supply chain management as organizations increasingly rely on suppliers to achieve operational excellence and customer satisfaction. It involves collaborative efforts by buying firms to enhance suppliers' capabilities, quality standards, technological competence, and overall performance (Adedokun et al., 2017). Through activities such as training, technical support, performance evaluation, financial assistance, and information sharing, supplier development strengthens supplier associations and improves supply chain efficiency. One key performance outcome associated with effective supplier development is the product quality, which measures how effectively an item or service fulfills its intended purpose, blending technical capability with business success. A high product performance reflects superior supply chain performance and customer satisfaction (Govindan et al., 2023). As competition intensifies in global and local markets, organizations are recognizing that investing in supplier development can substantially reduce defects, delays, and low product quality thereby improving perfect order fulfillment and creating sustainable competitive advantage. Consequent upon this, evaluating the effectiveness of supplier development requires a closer look at key metrics, with product performance emerging as a critical indicator of operational success (De Silva et. al., 2025). Oil and Gas services industry in Port Harcourt is a highly competitive and quality sensitive industry where product performance is a crucial determinant of operational efficiency, customer satisfaction and organizational sustainability. Ideally, oil and gas service companies are supposed to provide products and services that satisfy the required specifications, industry standards and expectations of the client, consistently and in all circumstances. Good product performance is indicated by high product quality conformance, low defects, reliability and meeting with regulatory requirements. This can build customer trust, minimise operating interruptions and give companies a competitive advantage in the market. Despite the expectation, there remains a substantial number of service companies in the oil and gas industry facing some performance related issues with their products. Non-compliant to quality specification, product defect, rework, customer complaint and material rejected due to product being unreceptive have been reported in the industry (Bayram, 2024). The adverse consequences of these quality-related issues can lead to higher operational expenses, project delays, customer dissatisfaction, and damage to the company's reputation. High defect rates and quality inconsistencies continue to be a problem, indicating that the processes and systems underlying product delivery have some problems. The previous studies suggest several solutions such as quality management practices, supplier evaluation, supplier collaboration, supplier certification and supplier training programmes, to improve product performance (Govindan et al., 2023; Ladipo et al., 2022; Du et al., 2023; Fan & Kang, 2023; Golrizgashti et al., 2022). Although the above-mentioned methods have been found to be effective in some cases, it seems that product quality conformance problems and defect rates are commonplace in many oil and gas services companies. This indicates that current efforts to improve product performance through interventions did not sufficiently cover supplier-related factors. Hence, this study aims to investigate the correlation between supplier development and product performance of the oil and gas service companies in Port Harcourt. In particular, the study aims to explore the potential to improve product quality conformance and minimize defect rates with supplier development practices. The study hopes to give the managers and practitioners a practical set of recommendations with empirical evidence on the effectiveness of supplier development initiatives to improve product performance and gain sustainable competitive advantage.

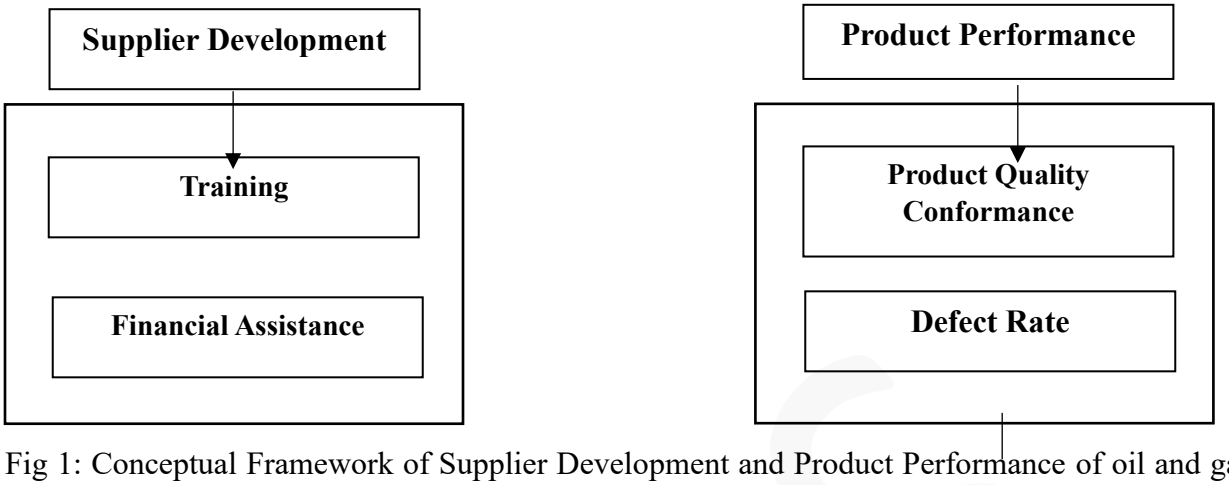


Fig 1: Conceptual Framework of Supplier Development and Product Performance of oil and gas services firms in Rivers state.

2. Social Exchange Theory

A social psychology and sociological viewpoint, social exchange theory posits that parties negotiate exchanges as the means by which societies evolve and remain stable (Ekeh, 1994). All human connections, according to social exchange theory, are born out of weighing the pros and cons of potential actions and making decisions based on that evaluation. Economics, psychology, and sociology are the theoretical antecedents. Relational costs include things like the time, energy, or money invested in a association as well as the undesirable qualities of one's partner. The good aspects of a association are its rewards, which might include things like acceptance, support, and companionship. According to the Social Exchange theory, each connection is valued by deducting its benefits from its drawbacks; a positive value indicates a healthy association (Scott, 2000). In contrast, a negative value denotes an inverse correlation. What happens in a association, or whether two people stay together or break up, is affected by how valuable the partnership is. All things pertaining to social exchanges, according to the social exchange theory, have results and pleasure that are reliant on connections.

According to the social exchange theory, in a reciprocal association, each side relies on and takes on the duties of the other. Trust, dedication, collaboration, and contentment are at the core of social exchange theory's tenets, as are the norms of associations that emerge through time and rule the association instead of formal agreements (Heide & John, 1992; Pratt & Dirks, 2007). The notion is applicable to the special connection that the customer forms with the provider in order to facilitate mutually advantageous commercial transactions. In exchange for innovative products, shorter lead times, higher product safety, better quality, competitive price, and less risk of non-supply, the buyer empowers the supplier through financial support, technical support, and supplier training.

3. Conceptual Review

Supplier Development

One definition offered by CIPS is "Supplier development," which is a purchasing organization's direct engagement with specific suppliers in an effort to boost those suppliers' performance. In it, the buying organization takes advantage of the supplier's knowledge and skill set to meet its business needs, and vice versa when necessary (Bosibori, 2014). If purchasing organizations encounter issues with their supply networks, Wagner and Krause (2006) state that supplier

development is one of three options available to them. Some examples of supply chain problems include suppliers that don't meet expectations, suppliers that aren't competitive, suppliers that can't support a company's strategic growth, and markets where there aren't enough competent providers (Ahmed & Hendry, 2012). The responsible purchasing professionals for the project must first choose the best supplier to develop before developing any supplier. This decision should be based on a number of factors, including the supplier's cooperation with the buying organization, the product or service supplied, the nature and scope of development needed, the current capacity compared to ideal capability, and so on. While there is no universally agreed-upon method for supplier development (Adedokun et al., 2017), there are three generally recognized levels that can be used to categorize efforts: basic, moderate, and advanced. These levels are based on the amount of firm involvement and the complexity of implementation (the amount of time, effort, and resources needed to carry out an activity successfully). Purchasing and supply management experts should first assess and understand the corporate goals and business requirements of their own organization before focusing on supplier development, according to Al-Doori (2019) and Iroegbu et al. (2018). This is a basic prerequisite to developing any strategy in this area. According to Yegon et al. (2015), organizations should only launch supplier development projects if they believe such endeavors would further their purchasing and supply management strategies, which in turn will further their overall organizational goals. But there are also more sophisticated, time-and resource-intensive, and difficult-to-implement direct investments in supplier development. Specifically, this study defines supplier development as "an ongoing, intentional activity that a buyer organization deliberately pursues to increase a supplier's capability, adaptability and value-creating potential by engaging in knowledge sharing, resource provisioning, performance development and collaborative learning processes that result in better operational outcomes and competitive supplier advantage along the supply chain." Supplier training and financial aid are two separate but related constructs of supplier development that will be examined in this research.

Training

According to Wong and Wong (2008), a company's procurement performance is influenced by both the company itself and its suppliers. Some customers have been more supportive of their suppliers than others when it comes to using trainings, according to the literature (Praxmarer-Carus et al., 2013; Yawar & Seuring, 2020; and Blount & Hill, 2015). The buyer's goal in developing training programs for suppliers is to increase the firms' productivity by strengthening the suppliers' technical capabilities in areas such as quality control, production methods, and management best practices (Glock, 2016). Depending on their priorities, buyers can design training programs with an eye toward immediate gratification or toward the long-term growth of their suppliers. Consequently, suppliers can participate in a variety of buyer-specific supplier development programs. This suggests that research that center on suppliers' points of view would be the most effective for determining what kinds of training would be most beneficial to them. Supplier training and education are regarded as essential for enhancing supplier competencies and fostering robust supplier collaborations, particularly in challenging sectors like as oil and gas (Agarwal et al., 2018).

Financial Assistance

Outsourcing production to suppliers sometimes leaves customers without direct control over product quality, which is vital for increasing sales and generating profitability (Jiang & Tian, 2022). Buyers can encourage suppliers to improve product quality by offering them financial

assistance, splitting investment costs, or opening doors to bank loans (Chakraborty et al., 2019, Dong et al., 2023, Huang, 2022, Tunca & Zhu, 2018). Research has shown that offering financial assistance is a great way to encourage supply chain enterprises to work together. This technique can help with financial difficulties and make operations more efficient (Chen et al., 2020, Li et al., 2023). In view of recent worldwide events like the COVID-19 epidemic and economic slump, many suppliers are struggling to secure working capital and are finding it difficult to fund their operations (Gernert, Wuttke, & Heese, 2023). Buyers' competitive advantages, product sales, and long-term cooperative associations can all benefit from suppliers being able to remove working capital limitations in quality improvement through lending.

Product Performance

Product performance is a multi-dimensional concept which refers to the degree to which the product meets the customer's requirements, technical specifications and functional objectives for which it was designed, consistently. It is a measure of the capacity of an organization to manufacture products which are reliable, durable, safe, and provide expected value to consumers. The modern literature on quality management considers product performance as an important element to ensure customer satisfaction, operational excellence, and competitive advantage, as organizations that consistently produce high-performing products are more likely to earn customer loyalty and reach high profits (De Giovanni & Zaccour, 2022; Bayram et al., 2024). Recent research also supports the view that customer expectations are changing and product performance has become a key strategic performance indicator in manufacturing and service industries, as products have become more complex.

Product quality conformance is one of the most accepted methods of determining product performance. Product quality conformance is the extent to which a product meets specific engineering requirements, industry standards and customer requirements. High quality conformance is a product that consistently meets the design tolerances without fail. In manufacturing, a typical way to measure quality conformance is to measure the percentage of products that meet the specifications at inspection and testing. High conformance quality will lead to less rework, fewer warranty claims, increased customer trust, and improved corporate image (De Giovanni & Zaccour, 2022). Likewise, quality research in quality 4.0 highlights the fact that in achieving high conformance quality with digital quality management system, organizations can benefit in terms of organizational competitiveness and customer satisfaction.

Defect rate is another important index of product performance; it is defined as the ratio of products that do not meet product quality requirements during production or after delivery. A low defect rate reflects the high manufacturing capability and quality control, while a high defect rate will point towards poor manufacturing capability, inefficiencies in the manufacturing process, rising production cost, customer dissatisfaction and lower operational performance. According to recent literature in the field of Zero-Defect Manufacturing (ZDM), reduction of defects is one of the main aims of organizations looking for continuous quality improvement and sustainable manufacturing performance. As a result, companies are increasingly implementing sophisticated quality management practices, integrating suppliers into their processes, and implementing digital inspection technologies to reduce defects and enhance overall product performance (Psarommatis et al., 2024).

4. Empirical Review

Researchers Mwesigwa and Nondi (2018) looked at how the World Food Programme's procurement performance was affected by supplier development. The research team at World Food Program Kenya set out to determine how supplier development affected the efficiency of their procurement processes. To provide a solid rationale for and to facilitate an in-depth investigation of how supplier development impacts procurement performance, the study used a descriptive survey research strategy. Questionnaires were distributed utilizing the "drop and pick" technique in order to gather data. While regression analysis was employed to examine the connection between supplier development and procurement success at WFP, mean and standard deviation were utilized to examine the extent to which concepts were implemented. In order to make the instrument better, a pilot study was done. Using Cronbach's alpha, we evaluated the study's reliability and validity. Statistical Package for the Social Sciences (SPSS) Version 23 for Windows was used to analyze the data on a personal computer. The data was analyzed and displayed visually through graphs, charts, and tables utilizing statistical tools such as frequency counts, percentages, means and standard deviation, regression, and correlation. The findings demonstrated that WFP in Kenya's procurement performance was positively and substantially affected by supplier development. All of the mentioned hypotheses were determined to have a substantial link with procurement performance when examined in the regression model. This study's results proved that supplier development was taking place in a cutthroat market.

In order to improve the sustainable performance of suppliers, DeSilva et al. (2025) conducted research on a developing country's dairy supply chain. Studying the mediating roles of farmer capabilities and the processor-farmer association, it aimed to analyze the effects of training, financial support, and quality-performance evaluation and feedback on suppliers' sustainable performance. Three hundred twenty-four dairy farmers who supplied milk to processors were included in the population. The researchers employed a quantitative survey design and analysed the data using partial least squares structural equation modelling (PLS-SEM). The findings revealed that financial support had the greatest impact on sustainable supplier performance among the three development initiatives examined. The processor–farmer association also played a substantial mediating role, with a solider effect than farmer capability. The study concluded that financial assistance can be an important supplier-development mechanism for improving supplier performance, particularly when supported by solid associations between buyers and suppliers. Although the study did not directly measure the buyer's product performance, its findings support the argument that financial assistance can strengthen supplier performance and potentially improve the quality and reliability of products supplied. Nasiche et. al. (2020) examined how supplier training affects the performance of sugarcane enterprises in Kenya. This research looked at how sugarcane businesses in Kenya fared after implementing supplier training, a component of supplier development. Its objective was to determine whether training suppliers could improve enterprise performance amid concerns about declining sugarcane yields. The study population consisted of approximately 250,000 active farmers, from which a sample of 400 was selected. With a response rate of 73.25 percent, 293 respondents filled out the researchers' surveys after they implemented a descriptive research strategy. Simple linear regression was used for the data analysis. Enterprise performance was positively and substantially correlated with supplier training ($r = 0.347,\ p < 0.001$). The researchers concluded that supplier training was positively associated with performance improvement in the sugarcane sector. Although the study supports the importance of training as a supplier-development practice, its outcome was enterprise performance rather than product quality specifically.

5. Methodology

This study population include fifty-seven (57) registered oil and gas services companies in Rivers State, Nigeria (PETAN, 2024A total of 57 oil and gas service providers are part of the Petroleum Technology Association of Nigeria (PETAN), an organization that represents indigenous technical oilfield service providers in Nigeria (PETAN, 2024). Three managerial positions represented the oil and gas services firms as test units and they include Procurement/Supply Chain Manager, Operations/Production Manager, Logistics/Delivery Supervisor. These roles were chosen because they are directly involved in supplier engagement, operational coordination, and delivery performance, which are central to the study objectives. A total of 117 people filled out the survey as a consequence of this. Information was retrieved from respondents using a standardized research questionnaire that includes multiple-choice items and is rated on a 5-point Likert scale. To ensure the accuracy and consistency of the study instrument, validity and reliability assessments were carried out. The reliability was evaluated using Cronbach's alpha coefficient, where an internal consistency level of 0.70 is considered to be a minimum. Validity of content ensured its integrity. By revising measurement questions from previous studies and seeking advice from experts, we were able to confirm the questionnaire's content validity. Descriptive and inferential statistics were used to examine the study's data. The data was summarized using descriptive statistics including standard deviation, frequency, and percentages. To investigate if user-generated content had any effect on delivery performance, inferential statistics, and specifically Spearman's Rank Order Correlation, were employed.

Model Specification

$PQC=\beta0 + \beta1T + \beta2FA + \varepsilon$

$DR=\beta0 + \beta1UT + \beta2FA + \varepsilon$

Where:

- PQC = Product Quality Conformance
- DR = Defect Rate
- T = Training
- FA = Financial Assistance
- β_0 = Constant
- β_1–β_2 = Regression coefficients
- ε = Error term

6. Results and Discussion

Survey copies of the questionnaire were administered directly to respondents. A total of three hundred and eighty-four (384) copies of the questionnaire were distributed to participants. The distribution and retrieval rate of the questionnaire are presented in Table 1.

Questionnaire	Number	Percentage
Distributed	171	100
Retrieved	171	100
Not retrieved	0	0
Retrieved used	168	98.2
Retrieved not used	3	1.8

Table 4.1 shows the questionnaire distribution and retrieval process for the study. As a result of errors, omissions, or blank entries some of the copies of the questionnaire were deemed unusable and were not included in the study. Out of a total of one hundred and seventy-one (171) copies of

the questionnaires distributed, one hundred and seventy-one (171) copies representing a response rate of 100% were retrieved. Out of the one hundred and seventy-one (171) retrieved, one hundred and sixty-eight (168) which represent 98.2% were used, and three (3) which represent 1.3% were not used for the study.

Validity and Reliability Analysis

The study instrument was subjected to validity and reliability testing to guaranty its correctness and consistency. An internal consistency level of 0.70 was considered to be a minimum acceptable result when testing reliability with Cronbach's alpha coefficient. Both the content and construct validity checks confirmed the validity. In order to ensure that the items measured the desired variables, we used factor analysis to determine their construct validity, and we reviewed the questionnaire with experts to ensure that the items were adaptable from past studies, which allowed us to obtain content validity. Below you will see the reliability test results.

Table 2. Reliability Test Result

Variables	No. of Statement Items	Reliability Results
Training	4	**.867**
Financial assistance	4	**.866**
Product Quality Conformance	4	**.863**
Defect Rate	4	**.798**

Correlation Analysis of the Association Between Supplier Development and Product Performance

Table 3: Correlation Analysis showing the association between training and product quality conformance

			MAIN_TRAINING	MAIN_PQC
Spearman's rho	MAIN_TRAINING	Correlation Coefficient	1.000	.982**
		Sig. (2-tailed)	.	.000
		N	168	168
	MAIN_PQC	Correlation Coefficient	.982**	1.000
		Sig. (2-tailed)	.000	.
		N	168	168

**. Correlation is substantial at the 0.05 level (2-tailed).

Table 4: Correlation Analysis showing the association between training and defect rate

			MAIN_TRAINING	MAIN_DR
Spearman's rho	MAIN_TRAINING	Correlation Coefficient	1.000	.851**
		Sig. (2-tailed)	.	.000
		N	168	168
	MAIN_DR	Correlation Coefficient	.851**	1.000
		Sig. (2-tailed)	.000	.
		N	168	168

**. Correlation is substantial at the 0.05 level (2-tailed).

Table 5: Correlation Analysis showing the association between financial assistance and product quality conformance

			MAIN_FA	MAIN_PQC
Spearman's rho	MAIN_FA	Correlation Coefficient	1.000	.773**
		Sig. (2-tailed)	.	.000
		N	168	168
	MAIN_PQC	Correlation Coefficient	.773**	1.000
		Sig. (2-tailed)	.000	.
		N	168	168

**. Correlation is substantial at the 0.05 level (2-tailed).

Table 6: Correlation Analysis showing the association between financial assistance and defect rate

Correlations

			MAIN_FA	MAIN_DR
Spearman's rho	MAIN_FA	Correlation Coefficient	1.000	.884**
		Sig. (2-tailed)	.	.000
		N	168	168
	MAIN_DR	Correlation Coefficient	.884**	1.000
		Sig. (2-tailed)	.000	.
		N	168	168

**. Correlation is substantial at the 0.05 level (2-tailed).

Table 3 to Table 6 shows that supplier development has positive and substantial association with product performance of the oil and gas services firms in Rivers State as revealed by the Spearman's rank correlation analysis. Specifically, training has a very solid positive correlation with product quality conformance (r = 0.982) and solid positive correlation with defect rate (r = 0.851). Likewise, financial assistance shows high positive correlation with Product Quality Conformance

(r = 0.773) and Defect Rate (r = 0.884). The results of the statistical analysis indicate that all of the associations are statistically substantial (p = 0.000 < 0.05) and that the corresponding null hypotheses (H01, H02, H03 and H04) are rejected. The results showed that training and financial assistance are both substantial in improving product quality conformance and also low defect rate, which ultimately improve the general product performance of oil and gas services companies in Rivers state.

7. Discussion of Findings

The findings of this study reveal that supplier development substantially influences product performance of oil and gas services firms in Rivers state. Specifically, the results indicate that both training and financial assistance have solid positive and statistically substantial associations with product quality conformance and defect rate. The findings are consistent with existing literature and theoretical expectations.

Firstly, the study found that training has a solid affirmative association with product quality conformance (r=982) and solid association with defect rate (r=851). This implies that when supplier development is adequately executed and solidifies supplier association management, organizations are better able to improve their product performance. This study is consistent with the finding of Nasiche et. al. (2022) who concluded that supplier training was positively associated with performance improvement in the sugarcane sector.

This study also found that financial assistance has a solid link with the measures of product performance (Product quality conformance, r=773 and Defect rate, r=884). This finding aligns with the empirical view of financial assistance as presented by DeSilva et. al. (2025), who revealed that financial support had the greatest impact on sustainable supplier performance among the three development initiatives examined. In the context of this study, offering financial assistance to suppliers can help improve and sustain product quality thereby resulting in optimum product performance. The implication is that oil and gas services firms in Rivers state can optimize product performance by supporting suppliers financially and also training. This will help in increasing the capability of the supplier to conform to product specification and also improve on durability and other associated qualities expected of the product.

From a theoretical perspective, the findings support the Social Exchange Theory (George Homan, 1958). The model posits that in exchange for innovative products, shorter lead times, higher product safety, better quality, competitive price, and less risk of non-supply, the buyer empowers the supplier through financial support, technical support, and supplier training.

8. Conclusion

Based on the findings of this study, it is concluded that supplier development is a critical driver of product performance of oil and gas services firms in Rivers state. Specifically, training and financial assistance enhance both product quality conformance and defect rate.

The study establishes that when suppliers are engaged in constant training and also supported financially, products conform to quality and specification and defect rate is minimal.

Furthermore, the study extends existing knowledge by demonstrating that supplier development goes beyond the unnecessary impression that ones you pay for a product you are entitled to get the best. This study has revealed that placing order and paying is not enough to achieve high product performance, training suppliers and assisting them will improve product quality and performance.

9. Recommendations

Based on the findings of the study on supplier development and product performance of oil and gas services firms in Rivers State, the following recommendations are proposed:

1. Oil and gas services firms in Rivers State should establish regular training programmes for their suppliers, focusing on product specifications, quality standards, technical requirements, quality control procedures and defect prevention.
2. To enable suppliers to acquire appropriate equipment, procure quality raw materials and improve production processes, management of oil and gas services firms should provide financial assistance to qualified suppliers through advance payments, favourable payment terms, access to credit facilities or targeted financial support.
3. Oil and gas services firms should strengthen long-term associations with their suppliers by combining training with financial assistance and technical support. This will promote trust, knowledge sharing and mutual commitment, consistent with Social Exchange Theory, while encouraging suppliers to meet established product specifications and performance expectations.
4. Oil and gas services firms should implement a systematic supplier performance evaluation framework that regularly assesses product quality conformance, defect rates and compliance with agreed specifications. The results should guide decisions on further training, financial assistance and corrective actions, ensuring that supplier development initiatives continuously improve product performance.

10. Contribution to Knowledge

This study contributes to knowledge by extending the role of supplier association management via supplier development to product performance and overall delivery performance. It provides empirical evidence that the supporting suppliers financially and training them enhances favourable product performance outcome.

The study also integrated key dimensions of supplier development with product performance measures, offering a more comprehensive understanding of their association. In addition, it validates the social exchange theory in an organizational context, showing that firms can get better product performance by consciously developing their supplier.

Finally, the study fills a contextual gap by focusing on firms in Rivers state, Nigeria, thereby providing insights relevant to emerging markets and linking supplier development directly to product performance.

References

Adedokun, F. B., Onikola, Y. S., & Oke, J. A. (2017). Influence of supplier development on organization performance: An empirical investigation of the manufacturing sector in Oyo State, Nigeria. *International Journal of Economics and Business Management, 3*(2), 29–38.

Ahmed, M., & Hendry, L. (2012). Supplier development literature review and key future research areas. *International Journal of Engineering and Technology Innovation, 2*(4), 293–303. https://doi.org/10.1016/j.jom.2006.02.001

Bayram, B., Deserno, L., & Greiff, K. (2024). *Product quality in the circular economy: A systematic review of its definition and contexts in scientific literature*. *Circular Economy and Sustainability, 4*(4), 2713–2747. https://doi.org/10.1007/s43615-024-00396-0

Blount, I. Y., & Hill, J. A. (2015). Supplier diversification by executive order: Examining the effect reporting compliance, education and training, outreach, and proximity to leadership have on government procurement behavior with minority business enterprises. *Journal of Purchasing and Supply Management, 21*(4), 251–258. https://doi.org/10.1016/j.pursup.2015.04.001

De Giovanni, P., & Zaccour, G. (2022). A survey of dynamic models of product quality. *European Journal of Operational Research, 303*(1), 1–18. https://doi.org/10.1016/j.ejor.2022.06.010

DeSilva, L., Jayamaha, N., & Garnevska, E. (2025). Supplier development to improve supplier sustainable performance: A test on a dairy supply chain of a developing country. *International Journal of Productivity and Performance Management, 74*(11), 119–142. https://doi.org/10.1108/IJPPM-04-2024-0264

Du, J., Liu, Y., Um, K.-H., & Kang, M. (2023). Effect of supplier development on innovation performance: Moderating role of supplier evaluation and IT use with suppliers. *Total Quality Management & Business Excellence, 34*(11–12), 1508–1525. https://doi.org/10.1080/14783363.2023.2182676

Ekeh, P. P. (1974). *Social exchange theory: The two traditions*. Harvard University Press.

Fan, Z., & Kang, T.-W. (2023). Linking sustainable supplier selection to firm's sustainable performance: The moderated mediating role of supplier development and leadership for functional integration. *Sustainability, 15*(12), Article 9757. https://doi.org/10.3390/su15129757

Gernert, A. K., Wuttke, D. A., & Heese, H. S. (2023). Sourcing and pricing decisions under upstream competition with a financially distressed supplier, endogenous bankruptcy risk, and a backup supply option. *Production and Operations Management, 32*(8), 2475–2490. https://doi.org/10.1111/poms.13986

Glock, C. H. (2016). Training suppliers by delegating workers: A decision support model. *Computers & Industrial Engineering, 93*, 302–309. https://doi.org/10.1016/j.cie.2016.01.005

Golrizgashti, S., Mohammadi Bidhandi, H., Safari, M., & Hodaei, H. (2022). A causal structure between total quality management, organisational culture, knowledge management, supplier integration and supply chain performance: An FMCG case study. *International Journal of Integrated Supply Management, 15*(2), 206–231. https://doi.org/10.1504/IJISM.2022.121990

Govindan, K., Aditi, Kaul, A., Darbari, J. D., & Jha, P. C. (2023). Analysis of supplier evaluation and selection strategies for sustainable collaboration: A combined approach of best–worst

method and TOmada de Decisao Interativa Multicriterio. *Business Strategy and the Environment, 32*(7), 4426–4447. https://doi.org/10.1002/bse.3374

Heide, J. B., & John, G. (1992). Do norms matter in marketing relationships? *Journal of Marketing, 56*(2), 32–44.

Huang, X. (2022). Financing disruptive suppliers: Payment advance, timeline, and discount rate. *Production and Operations Management, 31*(3), 1115–1134. https://doi.org/10.1111/poms.13597

Jiang, B., & Tian, L. (2022). Effects of reactive capacity on product quality and firm profitability in an uncertain market. *Operations Research, 70*(5), 2619–2636. https://doi.org/10.1287/opre.2022.2310

Ladipo, P. K. A., Udofia, E. E., Oniku, A., & Ekpudu, J. E. (2022). Supplier collaboration practices and product innovation management. *Modern Management Review, 27*(3), 23–37. https://doi.org/10.7862/rz.2022.mmr.14

Liu, H. C., Liu, R., Gu, X., & Yang, M. (2023). From total quality management to Quality 4.0: A systematic literature review and future research agenda. *Engineering Management Review, 10*, 191–205. https://doi.org/10.1007/s42524-022-0243-z

Mwesigwa, F. M., & Nondi, R. (2018). Effects of supplier development on procurement performance of World Food Programme. *Strategic Journal of Business & Change Management, 5*(2), 1184–1205

Mwesigwa, F. M., & Nondi, R. (2018). *Effects of supplier development on procurement performance of World Food Programme*. *The Strategic Journal of Business & Change Management, 5*(2), 1184–1205. https://doi.org/10.61426/sjbcm.v5i2.724

Nasiche, F. A., Ngugi, P. K., Kiarie, D., & Odhiambo, R. (2020). Influence of supplier training on performance of sugarcane enterprises in Kenya. *Global Journal of Management and Business Research: A Administration and Management, 20*(A17), 73–85. https://journalofbusiness.org/index.php/GJMBR/article/view/3285

Nasiche, F. A., Ngugi, P. K., Kiarie, D., & Odhiambo, R. (2020). Influence of Supplier Training on Performance of Sugarcane Enterprises in Kenya. Global Journal of Management and Business Research, 20(A17), 73–85.

Psarommatis, F., May, G., & Azamfirei, V. (2024). Zero defect manufacturing in 2024: A holistic literature review for bridging the gaps and forward outlook. *International Journal of Production Research*. Advance online publication. https://doi.org/10.1080/00207543.2024.2388217

Sony, M., Antony, J., McDermott, O., & Garza-Reyes, J. A. (2022). Data analytics in Quality 4.0: Literature review and future research directions. *International Journal of Production Research, 61*(2), 678–701. https://doi.org/10.1080/0951192X.2022.2128219

Tunca, T. I., & Zhu, W. (2018). Buyer intermediation in supplier finance. *Management Science, 64*(12), 5631–5650. https://doi.org/10.1287/mnsc.2017.2863

Wagner, S. M. (2006). A firm's responses to deficient suppliers and competitive advantage. *Journal of Business Research, 59*(6), 686–695. https://doi.org/10.1016/j.jbusres.2006.01.006

Yawar, S., & Seuring, S. (2020). Reviewing and conceptualising supplier development. *Benchmarking: An International Journal, 27*(9), 2565–2598. https://doi.org/10.1108/BIJ-01-2020-0018

Yegon, J., Kosgei, D. K., & Lagat, C. (2015). Effect of supplier development on buyer performance: A survey of sugar milling firms in Western Region of Kenya. *European Journal of Logistics, Purchasing and Supply Chain Management, 3*(3).