

Human Resource Development and Organizational Performance in the Nigeria Liquefied Natural Gas Company Limited, Bonny

Mba Okechukwu Agwu¹ & Tonye Ogiriki²

¹ Department of Business Administration, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria

² Department of Finance and Accountancy, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria

Correspondence: Mba Okechukwu Agwu, Faculty of Management Sciences, Department of Business Administration, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria. Tel: 234-803-793-6191. E-mail: mbaagwu38@yahoo.com

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Abstract

The paper discussed human resource development (HRD) and organizational performance in the Nigeria liquefied natural gas company limited, Bonny. It views HRD as the integrated use of training and development, organizational development and career development to improve individual, group and organizational effectiveness. It assumes that HRD practices directly/indirectly enhance business performance through improvement in employees' skills, attitudes and behavior. The research question addressed the extent of the relationship between HRD practices (training and development) and increased employees motivation/commitment and organizational productivity in the Nigeria liquefied natural gas company limited, Bonny. The place of study is the bonny industrial area of the Nigeria liquefied natural gas company while the duration of study is between May 2013 and April 2014. A descriptive research design was used in executing the study, using 370 randomly selected NLNG employees from its industrial area in bonny island, for questionnaire administration. The sample size of 370 was determined from a population of 4,895 employees using Yamane 1964 sample size determination formula at 5% level of significance for sampling error. Data collected were analyzed using descriptive and inferential statistics. Results from the data analysis indicated that significant relationship exists between HRD practices (training and development) and increased employees motivation/commitment and organizational productivity in the Nigeria liquefied natural gas company limited, bonny and recommends among others: review of current training/development procedure, regular appraisal of employees job skill requirements, regular staff training/development, regular improvement of employees' condition of service and sustenance of current team building efforts/ incentive scheme.

Keywords: HRD practices, employees' motivation/commitment, organizational performance, NLNG bonny

1. Introduction

1.1 Background of the Study

The Nigeria liquefied natural gas company limited Bonny, was incorporated as a limited liability company on May 17, 1989, to harness Nigeria's vast natural gas resources and produce liquefied natural gas (LNG) and natural gas liquids (NGLs) for export. It is jointly owned by Nigerian National Petroleum Corporation (49%), Shell (25.6%), Total LNG Nigeria Ltd (15%) and Eni (10.4%). Its workforce comprises of 2,430 direct hire staff, 1,980 contract staff and 485 seconded staff from shareholder companies. With six trains currently operational, the entire complex is capable of producing 23.5 metric tons per annum (mtpa) of LNG, 4 mtpa of LPG and 2.4 mtpa of condensate from 3.5 billion cubic feet feedgas intake (NLNG, 2013).

In the period 1999–2011, NLNG converted about 92 billion cubic metres or 3.3 trillion cubic feet of Associated Gas (AG) to export LNG/NGL products (equivalent to about 968 LNG/NGL cargoes) which otherwise would have been flared. Presently, the company has the capacity to load and safely deliver over 340 cargoes of its products annually. It also delivers about 8% of the world's liquefied natural gas demand, supplies over 70% of Nigeria's liquefied petroleum gas needs and contributes about 7% of Nigeria's gross domestic product (NLNG, 2013).

With a mission to grow the company and its human resources to their full potential, a learning department was established to coordinate training/development of employees. The learning department regularly identifies employees' knowledge gaps in relation to their jobs (present or future) and arranges/organizes internal/external training/development programmes to bridge the identified knowledge gaps. This suggests that the company recognizes the value of HRD in achieving its mission of a global LNG company renowned for its operational excellence, cost leadership, high HSE standards, honesty and integrity.

HRD is the integrated use of training and development, organizational development and career development to improve individual, group and organizational effectiveness. Chalofsky (1992) defined it as the study and practice of increasing the learning capacity of individuals, groups, collectives and organizations through the development and application of learning-based interventions for the purpose of optimizing human and organizational growth and effectiveness. It involves all management decisions and practices that direct, affect or influence the human resource in an organization (Solke & Chaudhary, 2011).

The three key activities involved in HRD include: training, education and development (Nadler & Nadler, 1989). Training is involved in learning with focus on the learner's present job. Training may be off-the-job (conducted outside the office) or on-the-job (conducted within the office environment). Education is involved in learning with focus on the learner's future job while development is learning that is not focused on the job. However, the major challenge of achieving the objectives of these HRD activities (increased employees motivation/commitment and organizational productivity) in the NLNG is the lopsidedness in the selection/nomination of employees for training/development programmes, while direct hire staff often gets nominated seconded and contract staff do not have the same opportunity.

The effects of HRD on organizational performance have been extensively studied in the recent past with a positive relationship observed between HRD and firms' performance (Rizov & Croucher, 2008). However, one of the leading challenges in management has been the implementation of effective HRD strategies to enhance performance (Bhatti and Qureshi, 2007). As a result of the emphasis on performance, researchers have stressed on effective HRD strategies. Thus, Luthans et al. (2010) emphasized a resource-based approach to HRD practices i.e. optimal use of human resources as a key to achieving competitive advantage since it is difficult for competitors to replicate. This resource-based approach has resulted in considerable attention being given to HRD and organizational performance. It is against this background that it becomes pertinent to discuss HRD and organizational performance in the Nigeria liquefied natural gas company limited, Bonny.

1.2 Statement of the Problem

The major challenge of the NLNG learning department is the lopsided selection/nomination of employees for training, while direct hire staff often gets nominated for training/development programmes, seconded and contract staff does not have the same opportunity since their period of employment with the company is for a specific duration. Even among the direct hire staff, some who share the same social affiliation with their line heads/managers often gets nominated for foreign training/development programmes while those who do not, may not be nominated for foreign training.

This lopsided approach to staff training/development may result in loss of productivity, competitive advantage, corporate benchmarking, staff commitment and inefficiency. Human resource being the most vital factor of production, a positive, fair, forward looking human resource development programme devoid of all manner of social affiliations is a sine-qua-non for organizational efficiency and effectiveness (Solke and Chaudhary, 2011).

1.3 Research Objectives

The objectives of the research are as follows:

- (1). To determine the extent of the relationship between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny.
- (2). To determine the extent of the relationship between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny.

1.4 Research Questions

Despite the company's lopsided approach in the execution of its training/development programmes, the various milestones recorded could not have been possible without the development of its human resources through HRD practices i.e. training and development thus prompting the following research questions:

- (1). Does any significant relationship exist between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny?
- (2). Does any significant relationship exist between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny?

1.5 Research Hypotheses

In view of the above research questions, the following null hypotheses were formulated:

1H₀: There is no significant relationship between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny.

2H₀: There is no significant relationship between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny.

1.6 Literature Review

There is a large and growing body of literature that shows a positive linkage between human resource development and organizational performance. The emphasis on human resources in organizations reflects the view that market value depends less on tangible resources, but rather on intangible ones, particularly human resources (Stiles & Kulvisaechana, 2005). Recruiting and retaining the best employees, however, is only part of the human resources development framework. Organizations also has to leverage the skills and capabilities of its employees by encouraging individuals learning and creating a supportive environment in which knowledge can be created, shared and applied to achieve corporate goals of the organization.

Increasing employees' skills and abilities are expected to create future returns through increased productivity and business performance (Shih, Chiang, & Hsu, 2006). The processes of resourcing and development aimed at increasing employees skills have a direct impact on their attitude i.e. motivation, commitment and satisfaction (Wright et al., 2003). Specifically, a large body of research considers motivation to be a key determinant of employee performance (Hardre, 2003). Employees' attitudes and behaviours generally depend on the HRD policies and procedures the organization is using.

Certain HRD policies and procedures may convey a message to employees that it is in the organization's best interest that employees stay longer in the firm (Katou & Budhwar, 2007). This message may be translated into such employees' behaviours as staying longer within the organization as opposed to leaving and being present at work as opposed to being absent at work (Guest, 2001). In their multilevel model linking human resource practices and employee reactions, Ostroff and Bowen (2000) observed that human resource practices are significantly associated with employee perceptions and expectations. Chew (2004) observed that employee attitudes and behaviours (including performance) reflect their perceptions and expectations, reciprocating the treatment they receive from the organization. Campbell (1990) in his job performance theory stated that employees' attitudes influence their behaviour which in turn influences organizational performance.

It has been argued that employees' turnover is heavily influenced by job satisfaction, motivation and organizational commitment, because no employee would like to stay with an organization that is not satisfied with his work (Chiu & Francesco, 2003). Although, it is argued that satisfaction usually precedes organizational motivation and commitment, it is suggested that job satisfaction and organizational motivation and commitment are strongly interrelated (Bartlett, 2001). Other authors support the view that it is commitment that causes satisfaction (Vandenberg & Lance, 1992). Rowden and Conine (2003) observed that a large part of the workers sense of job satisfaction can be attributed to workplace learning opportunities.

Bartlett (2001) observed a positive relationship between training and organizational commitment and recommended that human resource development professionals adapt new research methods to demonstrate to organizational decision makers that training and development contributes to desired workplace attitudes which may in turn influence behaviours such as absenteeism and turnover. Lee and Bruvold (2003) stated that comprehensive training activities are positively associated with productivity; reduced staff intention to leave and organizational effectiveness.

Raghuram (1994) argues that staffing and training lie at the heart of the processes aimed at developing the necessary skills for maintaining competitive advantage and organizational performance. Although it is true that the source of competitive advantage refers to the human resources themselves and not to the policies employed to attract, utilize and retain them, recruitment and selection may be considered to be a good starting point for building a pool of superior employee resources and capabilities. Individual and team training and development may be employed to add new skills to the existing employee resources and capabilities.

1.7 Conceptual Framework

Human resources are unique because they are the only active factor of production that combines other production inputs to obtain the desired outputs; hence they need to be developed through properly articulated HRD policies and procedures. Thus, HRD is the integrated use of training and development, organizational development and career development to improve individual, group and organizational effectiveness. Swanson (1995) defined it as a process of developing and/or unleashing human expertise through organization development (OD) and personnel training and development (T&D) for the purpose of improving performance. It is also viewed as the process of acquiring and increasing the number of persons who have education, skills and experience which are critical for economic and social development (Sharma, 2004).

The three key activities involved in HRD include: training, education and development (Nadler and Nadler, 1989).

- Training is a learning activity provided by employers to employees, to help them perform, their current jobs more efficiently;
- Education focuses on learning designed to prepare an individual for a job different than the one currently held; and
- Development focuses on providing knowledge or skills within a specified area, but is not necessarily job related.

According to Armstrong (2005), the three levels of HRD analysis include: individual, organizational and social levels. The individual level of HRD analysis emphasizes on the human aspect of HRD and considers such concepts as self-efficacy, self-esteem, motivation to learn and motivation through expectation. The two main aspects of this level include: individual development and competence development. The organizational level of HRD analysis emphasizes on the resource aspect of HRD. The goal of HRD at this level is to acquire resources, improve efficiency and utilize employees' potentials to achieve organizational goals. Thus, HRD programmes must be designed to develop activities/inventions that solve system/organizational needs. The social level of HRD analysis emphasizes on community development, national competition and accessibility to networking. It also focuses on the educational segments and human capital development for promotion of national competition and increasing citizen life quality. The three aspects of this level include: the effect of HRD on: the national culture, the social/human capital and the learning community.

The models of HRD are divided two groups: HRD as a function and HRD as a field. The three models involved in considering HRD as a function include: rational models, natural models and human resource models based on the strategic reference points while the two models involved in considering HRD as a field include: open and close approach and I-A model. Rational models emphasizes on the coordination of organizational human resource system and organizational strategies. They are based on the liner relationship between business strategy and human resource strategy (Armstrong, 2005). Natural models believe that such factors as organizational strategy, technology, culture and marketing environment will affect the human resource strategy of an organization (Erabi & Fayazy, 2008).

HRD models based on the strategic reference point believe that human resource strategy is based on determinate goals or reference points that system's deciders have chosen (Bamberger & Meshoulam, 2005). The open approach is based on the integration of business strategy and HRD. It asserts that for each special business strategy, there are choices and processes that are distinct and limited while the closed approach believe that without attention to business and it's strategies, there are human resource activities that are occasionally useful. The goals of such activities are improving processes as integration, quality and team work that will result in better performance in a competitive environment (Louma, 1999).

The I-A model considers HRD as a field of activity in an organization. It classifies human resource activity into four dimensions: identity, integration, achievement and adaptation. The identity dimension is concerned with pointed actions that can help systems to maintain common sense or common culture. The integration dimension is concerned with pointed actions that make each member feel a sense of belonging to the system and try to keep people, processes and policies together as segments of the system. The achievement dimension is concerned with pointed actions that use resources to achieve system goals. In other words, the actions help to make a plan for achieving goals by human resource development. The adaptation dimension is concerned with pointed actions that can help the system to obtain information/resources from outside and adjust to changes in the environment.

1.8 Theoretical Framework

This research is based on the HRD-performance linkage model which is a diverging model from the HRM-performance linkage models of Becker and Huselid (1998) and Wright et al. (2003) whose core philosophy suggests that HR practices have a direct impact on employee skills and motivation, which are subsequently translated into improved operating performance that has adirect impact on financial performance. The HRD-performance linkage modelis based on the resource-based view (RBV) which states that increasing

employees' abilities and motivation, through HRD will ultimately improve organizational performance (Lopez et al., 2005). The central element of the RBV of human resources is the positive relationship between HRD and organizational performance (Mayo, 2000; Mabey & Ramirez, 2005). The RBV perspective advocates that the potential for competitive advantage of an organization is based on its ability to exploit the inimitable characteristics of its pool of human resources and capabilities.

The pool of employee resources and capabilities on which the RBV perspective is based, considerably depends on employee resourcing and development (Appelbaum & Reichart, 1998). The processes of resourcing and development aimed at providing increased skills to employees have a direct impact on their attitudes, such as motivation, commitment and satisfaction (Bartlett, 2001; Fey et al., 2000; Wright et al., 2003).

Employees' attitudes and behaviours generally depend on the HRD policies and procedures the organization is using. Employees' attitudes influence their behaviour which subsequently influences organizational performance (Wright et al., 2003). It is argued that employee turnover is heavily influenced by job satisfaction, motivation and organizational commitment (Hardre, 2003). It is also argued that satisfaction usually precedes organizational motivation and commitment while job satisfaction, organizational motivation and commitment are strongly interrelated (Bartlett, 2001). The basic causal pathway of this HRD-performance linkage model is as stated thus:

Resourcing → Development → Skills → Attitudes → Behaviour → Performance

Considering this causal pathway, the general framework of the mediating models is indirect linkage or hierarchical linkage through the outcomes of skills, attitudes, and behaviour between development and organizational performance (Black, 2001). In these models we may also see a direct linkage between the individual policies of resourcing and development and the individual outcomes of skills, attitudes, and behaviour and organizational performance (Schuler & Jackson, 1999). However, these linkages may not be present at the same time. It may be possible that in the absence of a direct linkage, some policies may significantly contribute to organizational performance through the intervening process.

Furthermore, this intervening process may be 'moderated' by organizational contextual variables. By appropriately managing these moderating organizational features: management style, organizational culture, size, life cycle stage, union intensity and capital intensity, HRD has the potential to be a source of competitive advantage (Ferris et al., 2007).

2. Method

2.1 Research Scope/Design

The scope of this research is limited to the direct hire staff, contract staff and seconded staff working at the industrial area of the Nigeria liquefied natural gas company limited, Bonny. It is assumed that responses obtained from the sample respondents would be representative of the opinions of all categories of employees at the industrial area of the company on their perception of human resource development (HRD) and organizational performance in their company. The duration of study is between May 2013 and April 2014. The core aspect of the study is the use of cross sectional survey research design in generating the required primary data.

A sample of 370 randomly selected respondents from a population of 4,895 NLNG employees consisting of 2,430 direct hire staff, 1,980 contract staff and 485 seconded staff at the industrial area of the company in Bonny Island was used for questionnaire administration. The sample size of 370 was determined from the population size using Yamane 1964 sample size determination formula at 5% level of significance for sampling error. The sample respondents were selected using shuffling of cards method (without replacement) in which all the names of the three categories of employees' were each separately written on small cards and the name on the topmost of each of the three group of cards was selected each time, the cards were shuffled until all the sample respondents were selected.

Data collected were analyzed using descriptive and inferential statistics. The questionnaire was designed to obtain a fair representation of the opinions of 370 sample respondents (184 direct hire staff, 149 contract staff and 37 seconded staff) using a four-point Likert type scale. The questionnaire responses of the sample respondents were presented using tables while formulated hypotheses were tested using analysis of variance (ANOVA). A total of 370 copies of the questionnaire were administered, collected and used for the analysis.

2.2 Calculation of Sample Size

The sample size was determined from the population of 4,895 NLNG employees at the industrial area of the company in Bonny Island using Yamane (1964) formula for sample size determination thus:

$$n = \frac{N}{1 + N(e)^2}$$

Where: n= sample size, N= population size, e= level of significance/sample error factor.

$$n = \frac{4,895}{1 + 4,895(0.05)^2} = \frac{4,895}{13.2375} = 369.78 = 370$$

3. Results and Discussion

3.1 Distribution of Responses on Research Questions

3.1.1 Question Number 1

Does any significant relationship exist between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny? Table 1 shows that questions: 1, 2, 3, 4, and 5 with varying mean scores of 3.00, 2.84, 2.78, 2.73 and 3.03 were above the weighted average of 2.5. The table further revealed a grand mean score of 2.88 indicating a strong evidence of the existence of a significant relationship between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny. This conclusion is buttressed by the observation of Bartlett, 2001; Fey et al., 2000 and Wright et al., 2003 that the processes of resourcing and development aimed at providing increased skills to employees have a direct impact on their attitudes, such as motivation, commitment and satisfaction. This conclusion is also supported by the observation of Rowden and Conine (2003) that a large part of the workers sense of job satisfaction can be attributed to workplace learning opportunities.

$$\text{Mean Score} = \frac{4n_4 + 3n_3 + 2n_2 + 1n_1}{(n_4 + n_3 + n_2 + n_1)} \quad (1)$$

Where n1, n2, n3 and n4 are the respective number of responses obtained from each of the four options provided while 1, 2, 3 and 4 respectively represent the weights (SA (4), A (3), D (2) & SD (1) attached to each of the four options.

Table 1. Mean responses on the relationship between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny (n=370)

No.	Research Questions	SA(4)	A(3)	D(2)	SD(1)	Total Responses	Mean Score
1.	Do NLNG's HRD practices (training and development) motivate employees to put in their best in accomplishing their tasks?	150 600	100 300	90 180	30 30	1110	3.00
2	Do NLNG's HRD practices (training and development) enhance employees' job satisfaction in the company?	130 520	100 300	90 180	50 50	1050	2.84
3	Do NLNG's HRD practices (training and development) create a positive employees' job attitude in the company?	120 480	100 300	100 200	50 50	1030	2.78
4	Do NLNG's HRD practices (training and development) provide employees' with greater intrinsic rewards than other traditional HRD tools?	130 520	80 240	90 180	70 70	1010	2.73
5.	Do NLNG's HRD practices (training and development) increase employees' commitment to the company?	160 640	100 300	70 140	40 40	1120	3.03
	Grand Mean						2.88

Source: Field Survey, 2014.

3.1.2 Question Number 2

Does any significant relationship exist between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny? Table 2 shows that questions: 6, 7, 8, 9, and 10 with mean scores of 2.70, 2.97, 2.84, 2.68 and 3.00 were above the weighted average of 2.50. The grand mean of 2.84 shows that there is a strong evidence of a significant relationship between HRD

practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny. This conclusion is buttressed by the observation of Lopez et al., 2005 that increasing employees' abilities and motivation through HRD will ultimately improve organizational performance. The conclusion is also supported by Lee and Bruvold (2003) observation that comprehensive training activities are positively associated with productivity; reduced staff intention to leave and organizational effectiveness.

Table 2. Mean responses on the relationship between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny (n=370)

S/No.	Research Questions	SA(4)	A (3)	D(2)	SD(1)	Total Responses	Mean Score
6.	Do NLNG's HRD practices (training and development) increase employees' individual output in the company?	120 480	90 270	90 180	70 70	1000	2.70
7.	Do NLNG's HRD practices (training and development) increase organizational productivity?	150 600	100 300	80 160	40 40	1100	2.97
8.	Do NLNG's HRD practices (training and development) bring about greater flexibility and increased workflow?	130 520	100 300	90 180	50 50	1050	2.84
9.	Do NLNG's HRD practices (training and development) bring about production efficiency?	110 440	100 300	90 180	70 70	990	2.68
10.	Do NLNG's HRD practices (training and development) bring about cost effectiveness in production?	160 640	90 270	80 160	40 40	1110	3.00
	Grand Mean						2.84

Source: Field Survey, 2014.

3.2 Test of the First Hypothesis

H₀: There is no significant relationship between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny.

H₁: There is a significant relationship between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny.

Table 3. Computation of statistical variables on the first hypothesis from table 1

S/No.	Strongly Agree		Agree		Disagree		Strongly Disagree	
	X	X ²	X	X ²	X	X ²	X	X ²
1	150	22500	100	10000	90	8100	30	900
2	130	16900	100	10000	90	8100	50	2500
3	120	14400	100	10000	100	10000	50	2500
4	130	16900	80	6400	90	8100	70	4900
5	160	25600	100	10000	70	4900	40	1600
Total	690	96300	480	46400	440	39200	240	12400

Source: Survey Data, 2014.

Calculation of total sum of squares (SS_T)

$$SS_T = \sum_{i=1}^C \sum_{j=1}^{n_1} (X_{ij} - \bar{X}_i)^2$$

$$\sum X^2 = 96300 + 46400 + 39200 + 12400 = 194300$$

$$\frac{\sum(X)^2}{N} = \frac{(690+ 480 + 440 +240)^2}{20} = 171125$$

$$SS_T = 194300 - 171125 = 23175$$

$$SS_T = 23175$$

Calculation of between group sum of squares (SS_B)

$$SS_B = \sum_{i=1}^c n_i (\bar{X}_i - \bar{X})^2$$

$$\frac{\sum (X)^2}{n} = \frac{(690)^2}{5} + \frac{(480)^2}{5} + \frac{(440)^2}{5} + \frac{(240)^2}{5}$$

$$= 95220 + 46080 + 38720 + 11520 = 191540$$

$$\frac{\sum (X)^2}{N} = \frac{(690 + 480 + 440 + 240)^2}{20} = 171125$$

$$SS_B = 191540 - 171125 = 20415$$

$$SS_B = 20415$$

Calculation of within group sum of squares (SS_W)

$$SS_W = \sum_{i=1}^c \sum_{j=1}^{n_i} (X_{ij} - \bar{X})^2 \text{ or } SS_W = SS_T - SS_B$$

$$SS_T - SS_B = 23175 - 20415 = 2760$$

$$SS_W = 2760$$

Calculation degrees of freedom

$$SS_T \text{ df} = N - 1 = 20 - 1 = 19$$

$$SS_B \text{ df} = c - 1 = 4 - 1 = 3$$

$$SS_W \text{ df} = n - 1 + n - 1 + n - 1 + n - 1 = 4n - 4 = 4(5) - 4 = 20 - 4 = 16$$

Calculation of Variances

$$\text{Between group variance } (S_B^2) = \frac{\text{Between group sum of squares } (SS_B)}{\text{Between group degree of freedom}}$$

$$S_B^2 = \frac{\sum_{i=1}^c n_i (\bar{X}_i - \bar{X})^2}{c - 1}$$

$$S_B^2 = \frac{20415}{3} = 6805$$

$$\text{Within group variance } (S_W^2) = \frac{\text{Within group sum of squares } (SS_W)}{\text{Within group degree of freedom}}$$

$$S_W^2 = \frac{\sum_{i=1}^c \sum_{j=1}^{n_i} (X_{ij} - \bar{X})^2}{n - c}$$

$$S_W^2 = \frac{2760}{16} = 172.5$$

$$F\text{-value} = F_{df_1, df_2} = \frac{S_B^2}{S_W^2} = \frac{\text{Between group variance} = 6805}{\text{Within group variance} = 172.5} = 39.45$$

Table 4 shows that calculated F-Value of 39.45 resulted from the relationship between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny. This calculated F-Value is significant since it is greater than the critical F-Value of 5.29 given 3/16 degree of freedom at 0.01 level of significance. Hence, the null hypothesis is rejected while the alternative is accepted. This shows that there is a significant relationship between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny.

Table 4. Computation of analysis of variance on the relationship between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny

Source of variance	Sum of squares	Degree of freedom	Mean sum of squares	Calculated F-value	Table critical F-value	Decision
Between groups	20415	3	6805	4.39.45	5.29	H ₀ : Rejected
Within group	2760	16	172.5			
Total	23175	19				

Source: Statistical Computation and Table 3.

3.3 Test of the Second Hypothesis

H₀: There is no significant relationship between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny.

H₁: There is a significant relationship between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny.

Table 5. Computation of statistical variables on the second hypothesis from table 2

S/No.	Strongly Agree		Agree		Disagree		Strongly Disagree	
	X	X ²	X	X ²	X	X ²	X	X ²
6	120	14400	90	8100	90	8100	70	4900
7	150	22500	100	10000	80	6400	40	1600
8	130	16900	100	10000	90	8100	50	2500
9	110	12100	100	10000	90	8100	70	4900
10	160	25600	90	8100	80	6400	40	1600
Total	670	91500	480	46200	430	37100	270	15500

Source: Survey Data, 2014.

Calculation of total sum of squares (SS_T)

$$SS_T = \sum_{i=1}^c \sum_{j=1}^{n_i} (X_{ij} - \bar{X}_i)^2$$

$$\sum X^2 = 91500 + 46200 + 37100 + 15500 = 190300$$

$$\frac{\sum (X)^2}{N} = \frac{(670+480+430+270)^2}{20} = 171125$$

$$N = 20$$

$$SS_T = 190300 - 171125 = 19175$$

$$SS_T = 19175$$

Calculation of between group sum of squares (SS_B)

$$SS_B = \sum_{i=1}^c n_i (\bar{X}_i - \bar{X})^2$$

$$\frac{\sum (X)^2}{n} = \frac{(670)^2}{5} + \frac{(480)^2}{5} + \frac{(430)^2}{5} + \frac{(270)^2}{5}$$

$$= 89780 + 46080 + 36980 + 14580 = 187420$$

$$\frac{\sum (X)^2}{N} = \frac{(670+480+430+270)^2}{20} = 171125$$

$$N = 20$$

$$SS_B = 187420 - 171125 = 16295$$

$$SS_B = 16295$$

Calculation of within group sum of squares (SS_W)

$$SS_W = \sum_{i=1}^c \sum_{j=1}^{n_i} (X_{ij} - \bar{X})^2 \text{ or } SS_W = SS_T - SS_B$$

$$SS_W = SS_T - SS_B = 19175 - 16295 = 2880$$

$$SS_W = 2880$$

Calculation of Degrees of Freedom

$$SS_T df = N - 1 = 20 - 1 = 19$$

$$SS_B df = n - 1 = 4 - 1 = 3$$

$$SS_W df = n - 1 + n - 1 + n - 1 + n - 1 = 4n - 4 = 4(5) - 4 = 20 - 4 = 16$$

Calculation of Variances

$$\text{Between group variance } (S_B^2) = \frac{\text{Between group sum of squares } (SS_B)}{\text{Between group degree of freedom}}$$

$$S_B^2 = \frac{\sum_{i=1}^c n_i (\bar{X}_i - \bar{X})^2}{c-1}$$

$$S_B^2 = \frac{16295}{3} = 5431.67$$

$$\text{Within group variance } (S_W^2) = \frac{\text{Within group sum of squares } (SS_W)}{\text{Within group degree of freedom}}$$

$$S_W^2 = \frac{\sum_{i=1}^c \sum_{j=1}^{n_i} (X_{ij} - \bar{X}_i)^2}{n-c}$$

$$S_W^2 = \frac{2880}{16} = 180$$

$$F\text{-value} = F_{df_1, df_2} = \frac{S_B^2}{S_W^2} = \frac{\text{Between group variance} = 5431.67}{\text{Within group variance} = 180} = 30.18$$

Table 6 shows that calculated F-Value of 30.18 resulted from the relationship between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny. This calculated F-Value is significant since it is greater than the critical F-Value of 5.29 given 3/16 degree of freedom at 0.01 level of significance. Hence, the null hypothesis is rejected while the alternative is accepted. This shows that there is a significant relationship between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny.

Table 6. Computation of analysis of variance on the relationship between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny

Source of variance	sum of square	Degree of freedom	Mean sum of square	Calculate F-value	Table critical F-value	Decision
Between group	16295	3	5431.67	30.18	5.29	H ₀ : Rejected
Within group	2880	16	180			
Total	19175	19				

Source: Statistical Computation and Table 5.

3.4 Conclusion and Recommendations

The paper discussed human resource development (HRD) and organizational performance in the Nigeria liquefied natural gas company limited, Bonny. It assumes that HRD practices directly/indirectly enhance business performance through improvement in employees' skills, attitudes and behavior.

The three major findings of the research are as follows:

- ❖ NLNG's HRD practice of training and development provide their employees with greater intrinsic rewards than other traditional HRD tools.
- ❖ There is a significant relationship between HRD practices (training and development) and increased employees' motivation/commitment in the Nigeria liquefied natural gas company limited, Bonny.

❖ There is a significant relationship between HRD practices (training and development) and increased organizational productivity in the Nigeria liquefied natural gas company limited, Bonny.

Arising from the findings of this paper, it is suggested that NLNG management should take the following measures to improve the gains from its current training and development programme:

- (1). Review of current training/development procedure: NLNG management should review the current training/development procedure to ensure that every employee has equal opportunity of being nominated for both local and foreign training/development programmes.
- (2). Regular appraisal of employees' job skill requirements: NLNG management should regularly appraise employees' job skill requirements to ensure that every employee possesses the right skills required in his/her job.
- (3). Regular staff training/development: NLNG management should regularly organize training/development programmes to bridge knowledge gaps identified in employees' job/skill requirements.
- (4). Regular improvement of employees' condition of service: NLNG management should regularly improve employees' condition of service to ensure high level of staff morale, commitment, efficiency and low staff turnover.
- (5). Sustenance of current team building efforts/incentive scheme: The current team building efforts in NLNG should be improved to promote cohesion and interdependency in solving operational problems while the incentive scheme should be sustained to maintain high staff morale.

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