



INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES



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To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v8-i6/4261>

DOI: 10.6007/IJARBSS/v8-i6/4261

Received: 11 June 2018, Revised: 29 June 2018, Accepted: 06 July 2018

Published Online: 12 July 2018

In-Text Citation: (Iqbal, Nisar, & Ali, 2018)

To Cite this Article: Iqbal, F., Nisar, A., & Ali, A. (2018). The Moderating Effect of Job Aid on the Relationship between Work Environment and Employees' Productivity in Oil and Gas Development Company Limited (OGDCL) of Pakistan. *International Journal of Academic Research in Business and Social Sciences*, 8(6), 630–651.

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Vol. 8, No. 6, June 2018, Pg. 630 - 651

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www.hrmars.com

ISSN: 2222-6990

The Moderating Effect of Job Aid on the Relationship between Work Environment and Employees' Productivity in Oil and Gas Development Company Limited (OGDCL) of Pakistan

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Abstract

Employees are central in the process of achieving organizational mission and vision through innovative products and services to outshine their competitors. However, employees need a work environment that permits them to work freely without problems. Prior literature indicates that work environment positively or negatively affects employees' productivity at workplace. Much research has been performed to investigate the effect of work environment and its various components on the employees' performance and productivity in various settings. However, Pakistani oil and gas industry especially OGDCL remained unexplored. Moreover, none of the studies have investigated the moderating effect of job aid on the relationship between work environment and employees' productivity. This study examined the moderating effect of job aid on the relationship between work environment and employees' productivity in OGDCL. A conceptual model was developed and tested using sample data of 70 employees from OGDCL and applying PLS-SEM. The results indicated that job aid positively moderated the relationships between supervisor support and employees' productivity, adequate workload and employees' productivity, physical work environment and employees' productivity. However, the relationships between incentives and recognition plans and employees' productivity and good relations with co-workers and employees' productivity were not moderated by job aid. The results provide important implications for academicians and practitioners. From academicians' point of view, the study enhances the scope of work environment factors influencing the employees' productivity especially in oil & gas companies. From practitioners' point of view, the results of the study could be used by the authorities at OGDCL and similar environment to accept the important variables that are crucial for the work environment and lead towards employees' productivity in this setting. Such an acceptance would help not only to improve work environment but also employees' productivity.

Keywords: *Work Environment, Employees' Productivity, Job Aid, Pls-Sem*

Introduction

Work environment plays a vital role towards the employees' productivity at workplace. According to Agbozo et al. (2017), an attractive and supportive work environment is paramount for employees' job satisfaction which ultimately leads towards employees' performance and productivity at workplace. On the other hand, many organizations fail to achieve their objectives due to their internal weaknesses because these are unable to understand the importance of work environment (Raziq & Maulabakhsh, 2015). Nevertheless, employees are central in the process of achieving organizational mission and vision through innovative products and services to outshine their competitors. Therefore, employees need a work environment that permits them to work freely without problems. Without this, employees cannot perform up to their full potential and abilities. Coopersmith (2017) described that work environment impact immensely on employees' productivity either towards negative or the positive outcomes. The importance of good work environment for employees cannot be undermined. Ogunyemi et al. (2015) found that majority of people spend more than 50% of their time within indoor activities which largely affect their mental health, abilities and performance. Therefore, a good work environment needs to be provided to the employees at workplace because a good physical environment boosts the morale of the employees and ultimately improves their performance and productivity.

Prior literature on various workplace environments and buildings indicated that the factors like cluttered workplaces and physical environment contributed towards the loss in employees' productivity (Bastida, Marimon, & Carreras, 2017; Housman, 2016). However, the factors of work environment have been changed since 1990s due to many social, organizational, technological and environmental changes (Armstrong, 2007). Different industries may have different factors for good work environment depending on the nature of their working environment. When employees emotionally as well as physically are fit, they have desire to perform well and enhance organizational outcomes in the form of productivity. Boles, Pelletier and Lynch (2004) argued that a good workplace environment enables the organizations to reduce absenteeism, and thus increase employees' performance and productivity. Much research has been conducted to test the effect of work environment and its various components on the employees' performance and productivity in various settings (Eyetsemitan, 2017; Afrianty, Issa, & Burgess, 2016) but less research has been conducted to investigate the effect of work environment in the oil and gas industry and even Pakistan remained largely unexplored.

Nevertheless, the oil and gas industry is among the most sensitive industries of the world where a good work environment is essential to contribute towards safe and successful operations with higher emphasize on health and safety and lower tolerance for work related illness and accidents. Moreover, it is vital that the oil and gas industry must work in a secure, safe, productive and human centered work environment with standard of welfare that must be consistent in line with technological advancements and social developments in this industry. Therefore, it is paramount to investigate which components of work environment influence the employees' productivity in oil and gas industry. The OGDCL of Pakistan is selected for this purpose. This study examined the moderating effect of job aid on the relationship between work environment and employees' productivity at OGDCL. A conceptual model was developed and hypotheses were formulated and tested based on data of sample of 70 employees from OGDCL. The PLS-SEM software was applied for the purpose of data analysis.

Literature Review

Work Environment

Taiwo (2010) defines work environment as “all the situation, events and people etc. that influence the way in which people live or work”. However, Kohun (1992) defines work environment as “the sum of all forces, actions and other influential factors that are currently and/or potentially contending with the employees’ activities and performance”. Opperman (2002) described that work environment consists of three sub-environments: human environment, technical environment and organizational environment. Human environment deals with peers, people other than peers, team and/or groups, leadership, management and interactional issues. This environment should be articulated in such a way that enables informal interaction to enhance knowledge sharing and exchange of ideas. This is considered as foundation for achieving maximum employees’ productivity. Technical environment deals with technological infrastructure, physical & technical components and tools & equipment. This environment creates technological setup that enables employees to execute their responsibilities and tasks. Organizational environment deals with vision & values, practices and systems & procedures. Organizational environment is controlled by the management of the organization. Problems in organizational environment effect employees’ productivity. According to Kyko (2005), there are two types of work environments: conducive and toxic. Conducive work environment provides pleasant environment to employees and encourages them to actualize their abilities and behaviors. This work environment enables employees to self-actualize their behaviors. For example, a conducive work environment converts an irresponsible employee into responsible employee. Toxic work environment, on the other hand, provides an unpleasant environment to employees and creates a de-actualize employees’ behavior. This work environment enables employees to low self-actualize their behaviors and proceeds towards negative traits. For example, a toxic work environment converts a responsible employee to irresponsible employee. Agbozo et al. (2017) described three types of work environment in their article published in journal of Human Resource Management: physical work environment, psychological work environment and social work environment. Physical work environment deals with physical or tangible things at the workplace such as office layout, ventilation, lighting, machinery, noise and space etc. The physical environment can influence the nature and level of social interaction between the employees. Psychological work environment deal with employees conduct related elements at workplace such as emotions, attitudes, behaviors, moods, psychological symptoms, affective disorders etc. The psychological work environment can influence the nature and level of employees’ feelings. Social work environment deals with relationships at workplace such as supervisor and employees relations, relationship between employees, team work and communication styles etc. Social work environment can influence the nature and level of personal respect such as discrimination based on the age, gender, race including sexual harassment etc.

Nevertheless, there is a long history of providing good and a safe work environment to employees at workplace in human resource management literature. Spector and Beer (1994)’s model of human resource management describes that work environment not only affects job commitment, congruence, competence and cost-effectiveness but also affects employees’ wellbeing. According to this model, work system designs have noticeable effect on physical and mental health of employees including longevity of life. According to Brenner (2004), the ability of an organization to share knowledge throughout the organization

depends upon the design of the work environment and how the organization uses this design as an asset. Ultimately, the design of work environment enables the organization to improve effectiveness and allows the employees to take benefit of the collective knowledge. He further added that a work environment design that suit to the employees' satisfaction and enables free flow of exchange of ideas is a better source of employees' job satisfaction and productivity. A suitable work environment design accelerates employees' motivation towards improved productivity (Brenner, 2004). Kyko (2005) finalized six elements of toxic work environment which contribute to low employees' productivity. These elements are: opaque management; biased boss; company's policies; working conditions; interpersonal relationship and pay. An effective work environment deals with a workplace that is attractive, comfortable, creative satisfactory and motivating for employees and provides a sense of pride and purpose to employees. Yesufu (1984) argued that physical conditions under which employees perform their duties is important for employees' productivity. Factories and offices that are too hot and ill ventilated are devastating to employees' productivity. There must be an adequate provision of protective clothing, rest rooms, drinking water, toilets and first aids facilities at minimum. Therefore, work environment is an essential ingredient of any workplace that not only shapes the views of the worker about their jobs but also affects their performance and productivity.

Work Environment Factors Influencing Employees' Productivity

Management of organizations must recognize and/or identify work environment factors that contribute towards employees' productivity. Various researchers have identified various work environment factors that affect employees' productivity in various settings. Lambert (2005) identified four work environment factors that affect employees' productivity at workplace: supervision; work method; provision of adequate fringe benefits; and well organized plans are among those factors. According to Nwachukwu (1988), supervision, subordinates, physical environment and outcome measurements are the major factors that affect employees' productivity at workplace. Elywood (1999) concluded that work environment factors that positively or negatively affect employees' productivity include temperature, humidity, noise, lighting, air flow, contaminants and hazards at workplace, type of sub-environment and employees' personal aspects. In a workplace index survey of a steel case, Brenner (2004) identified that better lighting, creative methods for assessing space, more elbow room, personalization, more unrehearsed meeting for work well done and involvement in the decision that impact their day to day lives at work are the major factors that affect employees' productivity. In a study of banks and insurance companies in Pakistan, Awan and Tahir (2015) identified that supervisor's support, good relations with co-workers, training and development, incentives, rewards and recognition plans and adequate workload are among work environment factors that improve employees' productivity at workplace. In a case study of a selected oil and gas industry in Nigeria, Taiwo (2010) found that inadequate infrastructural facilities, job related pressures, unpleasant relationship with management and co-workers, inadequate fringe benefits, employees' resident problems, lack of opportunities for staff training and development, lack of promotion opportunities and lack of job security are major factors that lead towards lower employees' productivity. Koretz (1995) cited four work environment factors that lead towards lower employees' productivity at workplace: inadequate supervision; employees' nonparticipation in decision-making; lack of rewards and chances of promotion; and heavy workload. Leonard (2000) found that greater sense of purpose, clear goals, less organizational bureaucracy, effective communication and being able

to see results are among the effective work environment factors to enhance employees productivity. Yang et al. (2016) identified that supervisor support and co-workers support decrease job stress which then increases employees' presenteeism which is paramount for increased employees' productivity. Sumantri (2017) revealed that a statistical relationship exists between physical working conditions, working hours, workload and employees' productivity. Khuong and Hoang (2015) cited that the presence of supervisor support, work incentives, physical work environment, performance feedback and job aid have positive effect on employees' productivity. Cecunc (2004) described that the provision of a work environment that enables to accomplishment organizational goals must aligned with employees' motivation. He added that such a work environment must provide opportunities to the employees for personal growth, recognition and reward, responsibility, achievement to get high quality productivity from employees. However, no study has explored and identified relevant work environment factors for employees' productivity in oil and gas sector especially OGDCL of Pakistan. The summary of literature review on the most cited work environment factors influencing employees' productivity in various settings is shown in Table 1. The most cited work environment factors are logically harmonized into six categories. Subsequently, these factors could be used to develop the conceptual model for this study due to lack of research on such factors in OGDCL.

Table 1: Harmonization of work environment factors

Cross-reference from literature Work environment factor from literature	Nwachukwu (1988)	Koretz (1995)	Elywood (1999)	Brenner (2004)	Lambert (2005)	Taiwo (2010)	Khuong and Hoang (2015)	Awan and Tahir (2015)	Yang et al. (2016)	Sumantri (2017)
Supervisor support	X	X			X		X	X	X	
Adequate workload		X						X		X
Physical work conditions	X		X	X		X	X			X
Incentives and recognition plan		X			X	X	X	X		
Good relations with co-workers	X					X		X	X	
Job Aid							X			

Note: an "X" indicates that the factor is present in the study.

Conceptual Model

A conceptual model is developed based on the work environment factors affecting the employees' productivity at workplace identified from the previous literature and logically harmonized into six categories as shown in Table 1. The theoretical framework is shown in Figure 1. It consists of work environment factors as independent variables and employees'

productivity as dependent variable. However, job aid is treated as moderating variable. The independent variables are supervisor support, adequate workload, physical work environment, incentives and recognition plans and good relations with co-workers. The dependent variable is employees' productivity. The moderating variable is job aid.

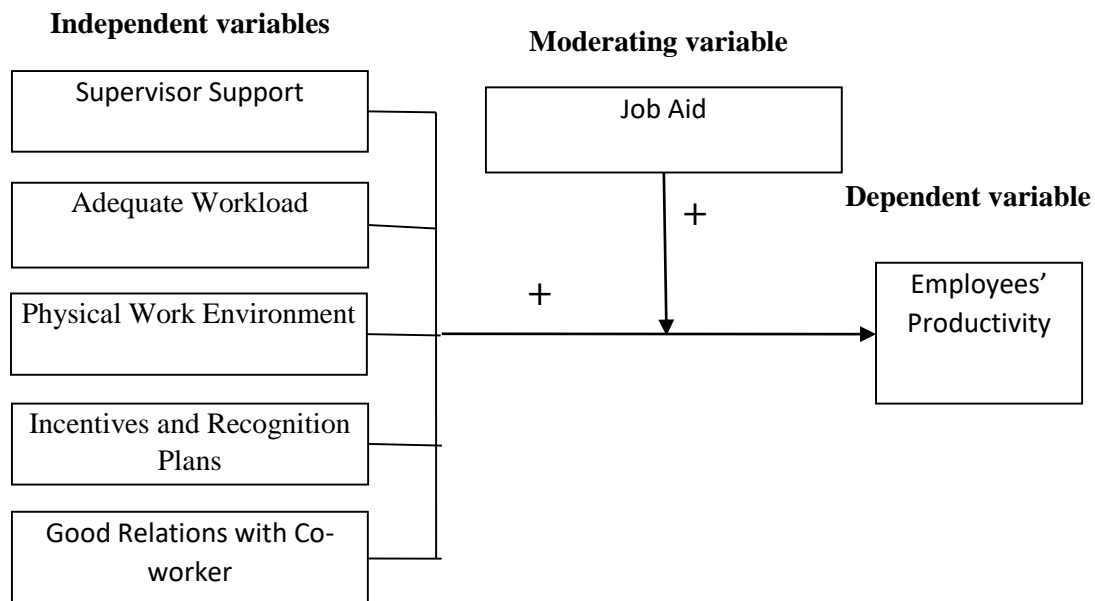


Figure 1: Conceptual Model

Dependent Variable

Employees' Productivity: According to Sahay (2005), productivity refers to as whether the activity of an organization is effective and efficient. Koss and Lewis (1993) argued that productivity involves both efficiency and effectiveness because an activity cannot be productive if it is efficient but not effective or effective but not efficient. Economists usually measure employees' productivity in terms of amount of goods and services that an employee produces in a given interval of time. Historically, employees' productivity refers to as labor productivity because initially it was measured with respect to work of laborers instead of professionals and managers. More specifically, it is conceptualized as utilization of available and scarce resources to give maximum output. It is reported in the productivity management literature that happy employees are more productive and negative attitudes can lower down employees' productivity in a very short time. Taylor (2016) suggested four key principles which could be applied to improve employees' productivity at workplace: systematically design the job, scientifically select and train the workers, cooperate closely with the workers and divide the work and responsibility equally between the worker and management. Other studies found that leadership quality directly affects employees' productivity (Sharma & Lakshmi, 2016; Awan & Tahir, 2015). However, human resource management practices related to management and performance can only work when these positively induce discretionary behavior such as feeling of job satisfaction and motivation etc. Job satisfaction, commitment, motivation, together or independently, would be only higher when employees positively experience the application of human resource strategies & policies related to create a productive workforce, motivate valued behaviors and provide opportunities for participation.

Independent Variables

Supervisor Support: A supervisor is an experienced person who acts as a role model for the subordinates and solves problems faced by the subordinates regarding their job and related tasks (Nijman & Gelissen, 2010). According to Elangovan and Karakowsky (1999), a supervisor conducts training programs for the employees including setting objectives, selecting trainer, developing lesson plans, determining methods & techniques and conducting training need analysis. However, Rabey, (2007) argued that a supervisor can be a trainer for the employees and assists the employees to perform their jobs through guidance on the operational process especially for the new operational procedures. A supervisor support improves the employees' productivity but in some cases a supervisor may fail to support the employees. For instance, the lack of communication between the supervisor and the employees on important information and process may leads towards serious problems (Harris, Simon, & Bone, 2000). Therefore, a working relationship between the supervisor and employees is required to improve productivity. The supervisor support as a work environment factor is vital for encouraging positive relations and increasing self-confidence among the employees which ultimately leads towards employees' productivity (Blau, 1964). Therefore, we can formulate the following hypothesis:

H1: *The degree to which supervisor support is provided to the employees positively increases the employees' productivity at workplace.*

Adequate Work Load: Workload consists of intensity of work assignment or the amount of work performed by an employee. Previous research revealed that workload has significant influence on employees' productivity. Sabir et al. (2012) argued that for higher employees' productivity, workload on the employees must be according to their abilities. Extreme high workload and extreme lower workload both lowered down the employees' productivity. In addition, sudden increase and decrease in workload correlates with impaired productivity. However, sudden increase in workload situation is more sensitive and negatively affects employees' productivity. Workload must be periodically investigated in terms of organizational initiatives and priorities. Workload should be determined and assigned according to the abilities and potential of the employees and employees should be involved in this process. However, organizational norms and priorities should not be compromised in this process. Employees should be allowed to rise to issues of workload with their supervisor. A strategy must be formulated to determine and assign the adequate workload on employees. From the above discussion, it is reasonable to believe that adequate workload enhance employees' productivity at workplace. Therefore, the following hypothesis is formulated:

H2: *The degree to which adequate workload is provided to the employees positively increases the employees' productivity at workplace.*

Physical Work Environment: Physical work environment involves employees' fit or misfit to the workplace. It is also known as the ergonomic workplace. According to Blau (1964), analysis of the physical workplace should be conducted to determine whether an ergonomic workplace is available for every employee or otherwise. Such type of analysis would help the employees to get not nervous or injurious, Moreover, McCoy and Evans (2005) emphasized

that the elements of work environment must be appropriate so that the employees would not be stressed while performing their job tasks. Mittleman (1996) described two elements which are related to physical work environment: office layout plan and office comfortable. He explained that physical work environment consists of an organizational area that is being arranged comfortably so that the goals of the organization should be fulfilled. On the other hand, poor layout or overcrowding may lead to common types of accidents like tripping and striking against objects. There are also other factors that can influence employees' productivity at workplace like noise that cause discomforts for the employees. According to Vischer (2007), in a good physical environment, employees can use their energy and efforts and pay their full attention to the work. Therefore, good physical work environment as a work environment element leads towards the increased employees' productivity at workplace. Hence, the following hypothesis is formulated:

H3: *The degree to which physical work environment is provided to the employees positively increases the employees' productivity at workplace.*

Incentives and Recognition Plans: Incentives and recognition plans often thought as an increase in salaries and promotions. However, these plans may be nonmonetary including verbal praise and certificates. According to Chandrasekar (2011), incentives and recognition plans not only consist of a combination of internal rewards like challenging assignments but also external rewards like higher compensation and peer recognition. Moreover, a motivating work environment is one in which employees are treated fairly. Irrespective of the input provided by an employee to the business process as a whole, the manager should give the employee a sense of honor. Engendering loyalty among employees is an important component to motivate the employees and resultantly to improve employees' productivity. Motivated employees are more productive than unmotivated employees (Awan & Tahir, 2015). Employees' performance is not only poor due to bad working conditions but also due to human resource management aspects such as lack of recognition of employees who perform well in the given conditions. Therefore, organizations must determine what motivates to the employees and setup formal and informal structures to reward them because this work environment factor leads towards improved productivity. It is reasonable to believe that incentives and recognition plans positively affects employees' productivity at workplace. Thus, the following hypothesis is formulated:

H4: *The degree to which incentives and recognition plans are provided to the employees positively increases the employees' productivity at workplace.*

Good Relations with Co-workers: Relation with co-workers covers relations with employees who are working at the same level. Awan and Tahir (2015) argued that co-workers can assist in completing the work tasks and reduce job stress. Moreover, Sharma and Lakshmi (1990) described that employees who have good relations with co-workers are usually more productive and successful even amid the severe job stress situation than employees with worse relations among each other. Good relations with co-workers are also vital for team work and synergy. Therefore, it is reasonable to believe that good relations with co-workers at workplace lead towards improved productivity. Hence, following hypothesis is formulated.

H5: *The degree to which employees have good relations with each other positively increases the employees' productivity at workplace.*

Job Aid: Job aid encompasses directions and guidance to enlighten the employees' productivity (Rossett & Gauier, 1991). Job aid also helps to increase employees' productivity. Cavanaugh (2004) have provided three ways to increase employees' productivity through job aid: 1) external support, 2) extrinsic support, 3) and intrinsic support. They described that in "external support means that the employees are required to take leave from the job and look for the source as for their reference to their job. Extrinsic support means that the job aid is given within the system itself. Intrinsic support is an insider or software that is used to enhance the efficiency of workflow". In other words, a job aid is the external aid to an individual. According to Rossett and Gauier, (1991), the objective of the job aid is to assist the job tasks. Job aid is used to increase the employees' productivity at real time. In conclusion, job aid makes the tasks easier and assists in minimizing errors. Job aid may include guides, templates, checklists and models. Therefore, it is reasonable to believe that job aid moderates the relationship between work environment factors such as supervisor support, adequate workload, incentives and recognition plans, physical work environment, good relation with co-workers and employees' performance. Therefore, the following hypothesis is formulated.

H6a: *Job aid positively moderates the relationship between supervisor support and employees' productivity at workplace.*

H6b: *Job aid positively moderates the relationship between adequate workload and employees' productivity at workplace.*

H6c: *Job aid positively moderates the relationship between physical work environment and employees' productivity at workplace.*

H6d: *Job aid positively moderates the relationship between incentives and recognition plan and employees' productivity at workplace.*

H6e: *Job aid positively moderates the relationship between good relations with co-workers and employees' productivity at workplace.*

Research Methodology

Sample and Sampling Technique

According to Kothari, (2004), a sample is a sub-group of the participants drawn from a study population that is of interest of the researcher for getting meaningful data to reach the conclusion. The study population consisted of services and exploratory departments' employees of OGDCL. A sample of 200 employees was selected from this population. The respondents were mainly the personnel who were responsible for employees' performance management and employees themselves. According to Best (2006), the data and information collected from the respondents assist the researcher to plan and generalize the findings of the study with respect to its research questions. It is reasonable to believe that the data collected from the selected respondents would help the researcher to generalize the finding to the entire population as well as to the other organizations operating in a similar environment. The selected sample is representative in the sense that the selected respondents are vital with respect to the virtue of their positions. Random sampling technique

was applied to collect data from the respondents. It is a probability based sampling technique in which respondents are selected randomly to gather the required data. Kothari (2004) argued that random sampling technique is suitable for quantitative studies where data is collected through survey questionnaires and reduces bias in the research which may be induced from the side of researcher. Therefore, the random sampling technique was applied in this study.

Data Collection Technique

This study used primary data collected from the respondents working at OGDCL headquarter Islamabad and at its various facilities in the country. Primary data consists of first hand information gathered directly from the respondents through various data collection techniques including interviews and/or survey questionnaires. However, interviews are commonly used to get qualitative data whereas survey questionnaires are commonly used to get quantitative data. Therefore, due to the quantitative nature of this study, survey questionnaires were used to get meaningful data from the respondents. Saunders et al. (2015) described that survey questionnaires can be open-ended and closed ended. Closed-ended questionnaires were used in this study. The process of data collection was started in July, 2017.

Measurements

Adopted items were applied to measure the independent and dependent variables of the study. A questionnaire was designed based on these items. However, some items were slightly updated based on the directions provided by two experts at OGDCL. The questionnaire consists of sections I & II. Section 1 was related to the work environment factors and filled by the employees themselves. Section 2 was related to the employees' productivity and filled by their immediate supervisors. The items of the scale for employees' productivity were adopted from Nielsen et al. (2017). The items of the scale for supervisor support were adopted from Rhoades, Eisenberger and Armeli (2001). The items of the scale for adequate workload and incentives and recognition plans were borrowed from hrsurvey.com website. The items of the scale for physical work environment were borrowed from Ndila (2012). The items of the scale for good relations with co-workers were adopted from Soulen (2003). The items of the scale for job aid were adopted from Allan (2017). All scales consisted of three to six items and assessed on "five point Likert scale ranging from 1 (Strongly Agree) to 5 (Strongly Disagree)".

Data Analysis Approach

The PLS-SEM is more appropriate for studies with small sizes or non-normal distribution of data (Peng & Lai, 2012). Therefore, due to the small sample size and non-normal distribution of data in this study, the PLS-SEM was applied for data analysis. The analysis was made based on the proposed model of Figure 1. Specifically, Smart PLS (V. 3.2.7) was applied for this purpose.

Data Analysis and Results

Sample Characteristics

After the two weeks of the questionnaires' distribution, 45 respondents returned completely filled questionnaires. Consequently, a reminder was sent to the non-respondents to increase the response rate. This resulted into 25 additional responses. In this way, a total of 70

respondents returned the completely filled and valid questionnaires. This formed a response rate of 35.00 %. The major issue in the survey research is that the non-response rate, if it is high enough, creates bias which affects the credibility of the results. Many approaches are available to address the issue but one of the commonly applied approaches is the assessment of the early-respondents and late-respondents on the main characteristics of the sample such as experience, designation, qualification, age, gender etc. Therefore, in this study, the issue of non-response bias was addressed by assessing the significance of the early-respondents and late-respondents against the main characteristics of the sample. The results revealed no significant difference. The sample characteristics are shown in Table 2 which indicates that the most of the respondents were from the operations (50.00%) followed by the field workers (35.71%) and the management (14.29%). The average (median) experience of the respondents in their job was 8 years. Moreover, large number of the respondents hold master degree (48) followed by the respondents which hold bachelor degree (20). However, only two respondents were below the master degree. Furthermore, the most participants belonged to 31-40 years of age (46) followed by 41-50 years of age (12) and 25-30 years of age (8). However, no respondent belonged to below 25 years of age. The sample characteristics show that the sample size is reasonable and covers the respondents from various hierarchical levels and, various brackets of experience and age. Therefore, it is reasonable to believe that the sample is representative sample.

Table 2: Sample characteristics

	Frequency	Percentage
<i>Role in organization (n=70)</i>		
Management	10	14.29
Operations	35	50.00
Field workers	25	35.71
<i>Experience</i>		
Experience (in years)	Median	
	6	
<i>Qualification</i>		
Master degree	48	
Bachelor degree	20	
Others	07	
<i>Age (in years)</i>		
Below 25	0	
25 to 30	8	
31 to 40	46	
40 to 50	12	
Above 50	4	

Testing of the Measurement Model

The measurement model is used to test and ensure the convergent and discriminant validity. Convergent validity deals with the notion that the indicators of the constructs must measure exactly what they are supposed to be measured. In PLS-SEM, four measures are commonly used to test and ensure convergent validity. These measures include "items loading, Cronbach's alpha, composite reliability (CR) and average variance extracted (AVE)". If these measures have values above the minimum required value then the convergent validity is

established otherwise not. In this study, the values of these four measures revealed after the process of data analysis are shown in Table 3. The results indicate that the items loading of all the indicators and Cronbach's alpha of all the constructs is greater than 0.7 which are the minimum threshold of this measure (Hair et al., 2017). Moreover, the results indicate that the CR and AVE of all the constructs are larger than the minimum threshold of 0.5 (Gefen & Straub, 2005). Hence, the convergent validity has been established.

Discriminant validity deals with notion that the indicators must demonstrate appropriate loading on their own constructs instead of other constructs. In PLS-SEM, two methods are usually applied to ensure discriminant validity. The first method is proposed by Gefen and Straub (2005). In this method, "indicators' loading is tested on its corresponding constructs and on other constructs. Discriminant validity is ensured if indicators' loading on its own construct is greater than the loading on other constructs". The second method is proposed by Fornell and Larcker (1981). In this method, "the square root of AVE between constructs and its measures are tested. Discriminant validity is ensured if the square root of AVE between constructs and its measures is equal to or greater than other constructs". The results are shown in Table 4 and Table 5. The results in Table 4 show that the items loading on their own constructs are greater than other constructs and the results in Table 5 indicate that the square root of AVE (shown by bold) between constructs and their measures are greater than other constructs. Therefore, the discriminant validity has also been established in this study. Hence, the measurement model has been validated.

Table 3: Measurement of constructs and indicators (with reliabilities)

Latent constructs		Item loading	Cronbach's Alpha	CR	AVE
Adequate Workload (AWL)	AWL1	0.985	0.802	0.813	0.751
	AWL2	0.848			
	AWL3	0.752			
	AWL4	0.725			
Employees' Productivity (EP)	EP1	0.866	0.934	0.848	0.752
	EP2	0.832			
	EP3	0.884			
	EP4	0.861			
	EP5	0.874			
	EP6	0.885			
Good Relations with Co-workers (GRC)	GRC1	0.892	0.883	0.719	0.739
	GRC2	0.864			
	GRC3	0.824			
	GRC4	0.858			
Incentives and Recognition Plans (IRP)	IRP1	0.656	0.749	0.760	0.753
	IRP2	0.688			
	IRP3	0.684			
	IRP4	0.664			
Job Aid (JA)	JA1	0.939	0.783	0.878	0.794
	JA2	0.920			
	JA3	0.862			
Physical Work Environment (PWE)	PWE1	0.840	0.900	0.708	0.843
	PWE2	0.787			
	PWE3	0.836			
	PWE4	0.857			
Supervisor Support (SS)	SS1	0.723	0.755	0.845	0.778
	SS2	0.787			
	SS3	0.814			
	SS4	0.712			

Table 4: Cross loading

	AWL	EP	GRC	IRP	JA	PWE	SS
AWL1	0.985	0.076	0.063	0.488	0.037	0.248	0.151
AWL2	0.848	0.023	0.028	0.457	0.034	0.185	0.100
AWL3	0.752	0.002	0.033	0.527	0.059	0.357	0.018
AWL4	0.725	0.011	0.026	0.461	0.033	0.269	0.050
EP1	0.049	0.866	0.146	0.303	0.067	0.431	0.766
EP2	0.105	0.832	0.103	0.114	0.130	0.212	0.767
EP3	0.069	0.884	0.253	0.243	0.186	0.167	0.772
EP4	0.015	0.861	0.214	0.248	0.010	0.176	0.776
EP5	0.052	0.874	0.260	0.247	0.194	0.249	0.793
EP6	0.044	0.885	0.165	0.213	0.089	0.328	0.761
GRC1	0.072	0.214	0.892	0.367	0.021	0.104	0.236
GRC2	0.011	0.194	0.864	0.254	0.167	0.080	0.163
GRC3	0.066	0.192	0.824	0.155	0.091	0.021	0.140
GRC4	0.006	0.143	0.858	0.280	0.119	0.164	0.108
IRP1	0.711	0.073	0.101	0.656	0.064	0.290	0.028
IRP2	0.675	0.104	0.042	0.688	0.211	0.319	0.063
IRP3	0.652	0.124	0.137	0.684	0.085	0.326	0.036
IRP4	0.036	0.261	0.557	0.664	0.025	0.180	0.239
JA1	0.028	0.043	0.387	0.247	0.939	0.010	0.066
JA2	0.049	0.110	0.381	0.014	0.920	0.032	0.059
JA3	0.063	0.001	0.363	0.057	0.862	0.161	0.059
PWE1	0.621	0.042	0.271	0.405	0.074	0.840	0.116
PWE2	0.651	0.107	0.196	0.635	0.089	0.787	0.072
PWE3	0.550	0.097	0.254	0.539	0.183	0.836	0.057
PWE4	0.617	0.050	0.154	0.653	0.169	0.857	0.028
SS1	0.176	0.396	0.191	0.249	0.154	0.230	0.723
SS2	0.032	0.568	0.073	0.174	0.033	0.221	0.787
SS3	0.111	0.286	0.242	0.119	0.046	0.142	0.814
SS4	0.106	0.355	0.080	0.059	0.030	0.115	0.712

Table 5: Inter-correlation of constructs and the corresponding square root of AVE

	AWL	EP	GRC	IRP	JA	PWE	SS
AWL	0.866						
EP	0.564	0.867					
GRW	0.639	0.220	0.860				
IRP	0.513	0.264	0.309	0.868			
JA	0.538	0.431	0.612	0.715	0.891		
PWE	0.552	0.301	0.589	0.376	0.635	0.918	
SS	0.641	0.391	0.394	0.200	0.688	0.234	0.882

Testing the Structural Model

The structural model is estimated for the purpose of hypotheses testing. This model is tested through two measures: 1) “the variance (R^2)”, and 2) “the path coefficient strength and their significance (t values)”. The results generated by the “Smart PLS bootstrapping at 5000” are presented in Table 6. The results show that the value of variance (R^2) is 0.877 which is greater than the minimum required threshold of 0.5 (Hair et al., 2017). It indicates that 87.7% variance in the dependent variable i.e. employees productivity can be explained by the five independent variables i.e. supervisor support, adequate workload, physical work environment, incentives and recognition plans and good relations with co-workers and one moderator i.e. job aid. Table 6 also shows the values of path coefficient strength (β) of all the constructs and significance (t-values). The results reveal that supervisor support demonstrates significance influence on employees’ productivity ($\beta = 0.282$, $t = 3.331$). This provides support for hypothesis H1. The results also indicate that adequate workload demonstrates a significance influence on employees’ productivity ($\beta = 0.323$, $t = 3.905$). This provides support for hypothesis H2. Moreover, physical work environment demonstrates significant influence on employees’ productivity ($\beta = 0.183$, $t = 6.388$). This provides support for hypothesis H3. Similarly, incentives and recognition plans demonstrates significance influence on employees’ productivity ($\beta = 0.326$, $t = 5.333$). This reveals that hypothesis H4 is also supported. Good relations with co-workers demonstrates significance influence on employees’ productivity ($\beta = 0.264$, $t = 3.789$). We can say that hypothesis H5 is also supported. The interaction effect of supervisor support with job aid demonstrates significant effect on employees’ productivity ($\beta = 0.489$, $t = 2.057$). This provides support for hypothesis H6a. It means for a unit rise in the interaction effect, employees’ productivity increases by 48.9 percent. In other words, job aid positively moderates the association between supervisor support and employees’ productivity. Moreover, the interaction effect of adequate workload with job aid demonstrates positive effect on employees’ productivity ($\beta = 0.381$, $t = 3.445$). This provides support for hypothesis H6b. It means for a unit increase in the interaction effect, employees’ productivity increases by 38.1 percent. In other words,

job aid positively moderates the relationship between adequate workload and employees' productivity. Furthermore, the interaction effect of physical work environment with job aid demonstrates positive effect on employees' productivity ($\beta = 0.371$, $t = 2.599$). This provides support for hypothesis H6c. It means for a unit rise in the interaction effect, employees' productivity would be increased by 37.1 percent. In other words, job aid positively moderates the relationship between physical work environment and employees' productivity. However, the interaction effect of incentives and recognition plans with job aid demonstrates no significant effect on employees' productivity ($\beta = 0.079$, $t = 0.432$). This provides no support for hypothesis H6d. Similarly, the interaction effect of good relations with co-workers with job aid demonstrates no significant influence on employees' productivity ($\beta = 0.097$, $t = 1.058$). This provides support for hypothesis H6e in this study.

Table 6: Strengths and significance of path coefficients

Constructs	Employees' productivity ($R^2 = 0.877$)		
	β	t-value	Hypothesis Support
Supervisor support (H1)	0.282	3.331	Supported
Adequate workload (H2)	0.323	3.905	Supported
Physical work environment (H3)	0.183	6.388	Supported
Incentives and recognition plans (H4)	0.326	5.333	Supported
Good relations with co-workers (H5)	0.264	3.789	Supported
Interaction of supervisor support and job aid (H6a)	0.489	2.057	Supported
Interaction of adequate workload and job aid (H6b)	0.381	3.445	Supported
Interaction of physical work environment and job aid (H6c)	0.371	2.599	Supported
Interaction of incentives and recognition plans and job aid (H6d)	0.079	0.432	Not supported
Interaction of good relations with co-workers and job aid (H6e)	0.097	1.058	Not supported

Discussion

The results of the study demonstrated that eight hypotheses including H1, H2, H3, H4, H5, H6a, H6b and H6c were supported and two hypotheses including H6d and H6e were not supported in the study environment. More specifically, the hypothesis H1 was indicated positive support for the employees' productivity. It means that supervisor support is important for increasing employees' productivity in this environment. This might be due to the fact that supervisors are in the position to guide, direct, manage and control employees and their support is an essential determinant of employees' productivity. This results is according to a previous study (Awan & Tahir, 2015) in which a positive relationship between supervisor support and employees' productivity was revealed workplace. The hypothesis H2 also revealed positive support for the employees' productivity. It means adequate

workload is crucial for employees' productivity at workplace. This result is also in line with the study of Agbozo et al. (2017) who found a positive relationship between adequate workload and employees' productivity at workplace. This might be due to the fact that adequate workload enables employees to achieve a balance between their personal activities and work duties which also leads towards employees' productivity at workplace. The hypothesis H3 also showed positive support for the employees' productivity. This shows that physical work environment is necessary to perform duties with ease and comfortable. This finding is also in line with the study of Sumantri (2017) who revealed a positive association between physical work environment and employees' productivity at workplace. The hypothesis H4 showed positive support for the employees' productivity. This shows that when incentives and recognition plans are provided to the employees then their productivity at work place increases. Similarly, H5 demonstrated positive support for the employees' productivity. It means that good relations with co-workers are vital to perform better at workplace. In the absence of good relations among employees, their productivity is badly affected due to conflicts among employees. This finding is also supported by a previous study (Sharma & Lakshmi, 2016) in which it was revealed that good relations with co-workers leads towards enhanced employees' productivity. The hypothesis H6a demonstrated positive support for the employees' productivity. It means when supervisor support is provided with job aid, then the effect on the employees' productivity is even enlarged. Therefore, supervisor support should be provided with job aid. This is the interesting finding of this study. The hypothesis H6b demonstrated positive support for the employees' productivity. It means when adequate workload is provided with job aid, then the effect on the employees' productivity is enlarged. Therefore, OGDCL and other organizations operating in a similar environment should pay special attention to this finding as well. The hypothesis H6c demonstrated positive support for the employees' productivity. It means when physical work environment is provided with job aid, then the effect on the employees' productivity is amplified. Therefore, physical environment and job aid should be provided simultaneously. The hypotheses H6d and H6e were not supported in this study. This was because of the reality that job aid is not provided to employees in OGDCL in the perspectives of incentives and recognition plans and good relations with co-workers. Hence, OGDCL should pay special attention to these areas. Appropriate measures should be taken to improve these areas to further increase in employees' productivity. These are the weak area in OGDCL which need to be improved.

Conclusion and Recommendations

This study examined the moderating effect of job aid on the relationship between work environment and employees' productivity in OGDCL. Various work environment factors influencing employees' productivity at workplace were identified through an extensive literature review. Resultantly, a total of five factors were finalized due to their comprehensiveness and well-recognition in the literature as shown in Table 1. Consequently, a conceptual model was developed based on these factors. Work environment factors were treated as dependent variables, job aid was taken as moderator and employees' productivity was treated as dependent variable. Six hypotheses were

proposed tested statistically taking a sample of 70 participants from OGDCL and analyzing the data through PLS-SEM approach.

The results indicated that the relationships between supervisor support and employees' productivity, adequate workload and employees' productivity, and physical work environment and employees' productivity were positively moderated by job aid. This shows the importance of these factors in the study environment. However, the relationships between incentives and recognition plans and employees' productivity, and good relations with co-workers and employees' productivity were not moderated by job aid in the study environment. The results of the study indicate that although, a positive relationship exist between various factors of work environment and employees' productivity but job aid positively moderates some of these relationships. In other words, job aid is a critical determinant that contributes as a catalyst towards enhanced employees' productivity at workplace. Therefore, organizations especially in oil and gas sectors should pay special attention to this determinant along with other work environment factors. However, the relationships which have not moderated by job aid should not be ignored at all.

The study makes many contributions to practices and theory .In practice, policymakers and decision-makers in OGDCL can use the results of this study to recognize the work environment factors influencing the employees' productivity in their operating environment. The findings of this study can be used understand the moderating role of job aid to strengthen the effect of work environment factors on employees' productivity. In this way, they can enhance employees' productivity in their business setting which would ultimately lead towards organizational productivity. Moreover, they can use the results to update their policies, strategies and plans regarding work environment and employees' productivity and organizational productivity and performance. Mangers in other organizations operating in similar circumstances can also take benefit of this study.

Theoretically, the study enhances the scope of work environment factors influencing the employees' productivity especially in oil & gas companies. The study contributes into the theory by investigating the moderating role of job aid on the association between work environment factors and employees' productivity which lacks in the prior knowledge base. The study also provides opportunities for future researchers to perform further research in this field.

This study possessed many limitations. First, the sample size was limited which may affect the generalisability of results. Second, the respondents' opinion was sought through closed ended questions which may restrict the respondents to provide more insights into the phenomenon under study. Third, the qualitative opinion of respondents was not sought which limited the detailed response from the respondents. Future researchers can address these limitations while conducting research in this area. Future researcher can involve more respondents, more organizations and even more industries to increase sample size so that the results can be generalised to other industries as well. Moreover future researcher can take qualitative response of the respondents to have more deep insights into the phenomenon under study. They can also include other environment factors to provide a more comprehensive view of factors influencing the employees' productivity at workplace.

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