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Psychosocial Construction Work Environment and Wellbeing in the Viability of Indigenous Construction Firms

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Abstract: The strategic role of indigenous construction firms (ICFs) in the development of the construction industry better construction output and infrastructural development in developing countries cannot be overemphasized. These goals may not be achieved if firms' psychosocial construction work environment and wellbeing (PCEW) are not appraised. To this end, this study identified and assessed factors relating to PCEW in the 37 factors influencing the viability and performance of construction firms obtained from the extant literature. A sample size of 65 staff of 31 ICFs out of a total survey of 177 staff of 59 ICFs that were awarded building contracts in selected institutions in Nigeria was accessed for this study. Respondents rated each factor on a five-point Likert scale of importance and mean scores were used to rank the factors after identifying factors that are related to ICFs' PCEW. The study identifies 14 PCEW related factors out of the 37 factors influencing the viability of ICFs and six of the top ten very important factors influencing ICFs' viability having high factor loading are PCEW related. The factors are quality of construction work and services, availability of skilled labour, employee satisfaction, and availability of artisans and craftsmen. Steady emphasis on factors influencing PCEW of construction workers amidst various factors influencing ICFs' viability is necessary for a healthier construction work environment and wellbeing.

Keywords: Indigenous construction firms (ICFs), psychosocial construction work environment and wellbeing (PCEW), psychosocial issue.

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1. Introduction

The Nigeria military government enacted a decree named the enterprise promotion act which recognised all firms with no other home base but Nigeria. This implies that local construction firms or ICFs are firms whose entire assets are owned and directed by Nigerian or association in Nigeria. In addition, most or all these managerial and financial operations are carried out by Nigerians (Olateju, 1991). This definition may not be different from the definitions of local firms in other various developing countries. However, it is sad to note that many ICFs have ceased to operate in Nigeria and other developing countries, while others operate at very low capacity, and this has given rise to growing concerns about their viability (Oladimeji, 2017; Hany et al., 2012).

Traditionally, there is more emphasis on construction organisation viability and performance based on financial criteria and their main advantage is that they are easily captured and provide a quantitative output. A balanced view of this measure reveals that financial measures are vital to the viability of the construction business but they need to be supported by other non-financial measures to achieve a holistic performance (Mbugua et al., 1999; Lenin, 2018). One of such measures is an assessment of the psychological and social wellbeing of people in construction firms, termed psychosocial construction work environment and wellbeing. Psychosocial health represents the multiple, dynamic interactions between social and behavioural variables (Martikainen, 2002; Enshassi et al., 2018).

Psychosocial issues in the construction work environment are increasingly catching the interest of researchers in the built environment (Goulding et al., 2018; Takim et al., 2016; Jia et al., 2016; Bell, 2015; Bowen et al., 2013). Research showed that these have contributed to workplace accidents, undue stress, and various ill-health experienced by construction workers. Goulding et al., (2018) in a recent study inferred that psychosocial issues internal and external factors are noted by construction professionals and managers, and they are inclined to adopting and adapting it to the systems and processes of organisations. They are quite conscious of various factors including psychosocial factors that have direct and indirect

effects needed in the delivery of the worthwhile strategy. It is important to note and know that these factors can be identified amidst other various factors determining the viability of construction firms. The research questions are: what are the ICFs viability factors that also influence the PCEW of construction workers and how important are they? To this end, this study identifies and evaluates the importance of factors relating to psychosocial construction work environment and wellbeing (PCEW) among 37 factors influencing the viability of indigenous construction firms (ICFs) drawn from the extant literature. This is intending to evaluate the importance of PCEW in the viability of ICFs so that they can be well harnessed in achieving better construction output to meet the infrastructural development needs peculiar to developing countries.

2. Literature Review

2.1. Factors Influencing the Viability of Construction Firms

Various studies have focused on measurement of performance, failure, success and key performance indicators of construction business (Bala et al., 2009; Halim, 2010; Hani et al., 2013; Ibrahim et al., 2014). They unveiled numerous factors influencing the viability of construction firms. These various dimensions of studies emphasised: (a) construction business financial management; (b) management of construction operations; (c) construction business companies and market environment evaluation studies; (d) construction business technical competence and (e) construction operation health and safety.

Construction business financial management identified various factors which emphasised the management of organisation financial activities so as to realise overall business strategy, and the strategic objective and mission of the finance section of the organisation (Peterson, 2020; Wang et al., 2010; Fatoye, 2012). Financial issues are of paramount importance to the operation of any business enterprise and it demands firms' due attention (Cheah and Garvin, 2004). These financial factors are (1) cash for construction work (Wang et al., 2010); (2) construction profit margin (Halim et al., 2010); (3) accessibility to building construction loan (Peterson, 2020); (4) interest on loan (Burtonshaw, 2016); (5) credit purchase of construction material (Peterson, 2020); (6) cost of plant and equipment purchase, maintenance and hiring (Randunupura and Hadiwattege, 2013); (7) prompt payment of work certificate (Fatoye, 2012); (8) cost of construction labour (Hiyassat et al., 2016) and (9) cost of construction material (Wahab and Lawal, 2011).

Studies on management of construction operations and business organisation focused measurement of construction business performance, highlighting the importance of managerial capacity and capability in the construction business. The following factors were identified: (1) management of construction site material (Gulghane and Khandve 2015; Alanjari et al., 2014); (2) predictability of construction cost and time (Aje et al., 2009); (3) management of construction site labour, plant and equipment (Jarkas and Bitar, 2012; Kuroshi and Lawal, 2014) (4) organisational competence and client satisfaction (Alzahrani and Emsley, 2013); (5) quality of works and services (Rumane, 2017); (6) employee satisfaction (Nudurupati et al., 2007) and (7) reputation of good client-contractor's relationship (Jagtap and Kamble, 2019).

Construction business evaluation and market environment studies argue that construction firms' success and failure are best assessed over time. A viable firm today may begin to reveal signs of not being viable over predetermined study time. The construction market refers to the total number of potential clients that the construction firm is serving and is supposed to serve. Factors influencing the viability of construction firms in this category are (1) age of operation (Kim and Arditi, 2010); (2) firm size (Huang, 2009); (3) firm's impact on the community (Bala et al., 2009); (4) tax (Peterson, 2020); (5) inflation (Semyalo et al., 2012); (6) corruption (Alabi, 2010); (7) construction work turnover and successful tender rates (Alzahrani and Emsley, 2013); (8) tendering practices (Kim and Reinschmidt, 2006:); (9) government policy (Bala et al., 2009) and (10) bad weather and natural disaster (Alinaitweet al., 2007).

Construction business technical competence finds expression in technical strength, structure, depth, capability, and capacity. High-performance contractors are known to have great experience which minimizes the technical risk, and result in the management of the only remaining risk that can minimize their profit. They provide high quality for the lowest possible price due to their technical expertise. Factors influencing the viability of construction business identified in this category are (1) construction technical expertise (Alzahrani and Emsley, 2007); (2) quality of construction work and services (Wang et al., 2010); (3) specialization of construction work (Koksal and Arditi, 2004); (4) advanced construction technology (Koksal and Arditi, 2004) and (5) number of high performing professionals (Oladimeji,2019).

Construction activities and complexities have increased rapidly; safety in construction activities is of paramount concern as there are tremendous losses due to workers' injuries (Gurcanli et al., 2015). Ulang et al., (2010) and Sidumedi (2009) corroborated this fact and stressed that construction industry worldwide is notorious for the unacceptably high accident and fatality rates while Odeyinka et al. (2005) earlier observed that construction workers are six times more likely to be killed at work than those in other industry. Performance factors and measures that bothers on construction health and safety influencing the viability of construction business are (1) incident rate (Odeyinka et al., 2005); (2) accident cost (Gurcanli et al., 2015) and (3) availability of safety equipment (Feng, 2013).

Most ICFs in Nigeria and other developing countries have either stopped construction operation or operating at very low capacity thereby casting a shadow of doubt on ICFs performance and viability (Alinaitwe, 2007; Bala et al., 2009; Hany et al., 2010; Oladimeji, 2017). This may be as a result of various construction firms' inadequacies and the difficult construction business environment. For example, most collapsed building are buildings constructed by ICFs (Oke and Falemu, 2009) and complex projects which are of very high construction work volumes and capacities are majorly executed by indigenised or foreign construction firms (Idoro, 2010). A study carried out by Awe (2006) and Ailabouni et al., (2009) while considering various manpower factors influencing construction productivity, observed ill motivation of construction workers resulting in the declining rates of apprenticeship and various construction work trade. The

problem of insufficient motivation by construction workers will be far from being solved if construction firms are insensitive to long term psychosocial environment issues that promote quality of life (Bell, 2015; Eurofound, 2006 – 2010). PCEW applies to the construction workplace's environment, community, and best procedures, which is all about individuals and process-based issues. PCEW can be broadly categorised into five namely: social aspects, role in organisation, organisational, job prospects, and characteristics factors (Bell, 2015).

2.2 The Role of PCEW Factors in the Viability of Construction Firms

2.2.1. Job characteristics

Job characteristics psychosocial issues are long work hours, workload, pressure, environment, and weather condition. Construction employees run the risk of being affected by work-related stress and depression. (Stattin and Järvholm, 2005; Nieuwenhuijsen et al., 2010; Boschman et al., 2013; Jia et al., 2016). The occurrences of work stress, occupational incidents and injuries along with burnout have been linked to construction job characteristics by research (Cordes and Dougherty, 1993; Goldenhar et al., 2003; Leung et al., 2010). For example, role conflict, time pressure, and workload are readily linked to burnout. Burnout is undesirable by both individual and organisation. Individual experiences burnout with obvious symptoms of psychological distress, substance abuse and low self-esteem, depression and anxiety (Maslach et al., 2001). It can be inferred from the foregoing that employee satisfaction, availability of safety equipment, incident rates, prompt payment of work certificate and government policy are construction firms' viability factors that can be directly influenced by job characteristics issues (Table 1).

2.2.2. Role in organisation

Role in organisation psychosocial issues entails job descriptions, skill utilisations, responsibilities, age and experience (Low et al., 2010). Overcompensation on job, skill underutilisation and lack of work control in construction firms is an often fallout of conflicts on roles. Comprehension and adequate understanding of employee respective roles are important to avoid such conflict (Razzaghian and Shah, 2011; Abbe et al., 2011; Manyena, 2009; Stattin and Järvholm, 2005; Takim et al.,2016). Abbe et al., (2011) in a study inferred that various construction work groups experienced varied occupational stressors as they play their different role in the construction organisation. The study revealed that as the years of experience on the job increases, less than 40% of the construction work group claimed they were able to exercise an increasing trend in work control while less than 30% were able to experience a decreasing trend in skill underutilization and overcompensation. Thus, Role in organisation issues can be directly influenced by factors influencing the viability of firms such as quality of construction work and services, employees' satisfaction, project organisational structure and incident rates (Table 1).

2.2.3. Social aspects

Social aspect psychosocial issues border on low social support; high staff turnover; transient nature of construction work; difficult team cohesiveness due to varying contract service terms and conditions; and sudden changes of work programme and location without much notice (Lunt et al., 2008; Eurofound, 2007; Sobeih et al., 2006). Resources are not enough to meet these construction work demands and inadequate social supports needed to cushion this stress have also been reported to predict burnout. Burnout is consistently related to a lower level of job satisfaction, absenteeism, organisational commitment, reduced productivity, and turnover (Schaufeli and Enzmann, 1998; Maslach et al., 2001). Employee regular complaint on burnout can lead to a feeling of emotional exhaustion and is also contagious (Bakker et al., 2001). Long-term competitiveness and efficiency of construction will be hampered when construction professionals and managers suffer from burnout). Employee satisfaction, project organisational structure, incident rates, government policy, and reputation of good client-contractor's relationship are viability performance factors directly influenced by various construction workers' social aspects psychosocial issues (Table 1).

2.2.4. Job prospects

Job prospects PCEW issues include career development; precarious work contract, job insecurity, uncertainty in work contracts, inequalities in salaries and discriminations (Lynch et al., 2000; Bell, 2015; EU-OSHA, 2015). Low wages and job insecurity are two common features of precarious employment (ILO), 2011). A high level of precarious work is perceived as long-term ills reportedly common in the construction sector. This is due to the fact that most firms especially ICFs are often in difficult financial status and are most likely to employed workers under precarious terms and conditions (Oladimeji and Aina, 2018). Precarious jobs are seen as a work arrangement where there is a lack of job security. Job security is one of the key components of viable employment (ILO, 2011). Evans and Gibb (2009) see it as a mode of employment characterised by a lack of legislative right or social gain, a high risk of occupational illnesses and accidents, a high degree of job instability, poor wages and employment tenure. Average or below minimum pay rates, job uncertainty and timing and lack of opportunity to improve wages are all results of job insecurity. Low profit and turnover of local construction firms is itself a precarious firms' condition which more often than not results in inadequate and sometimes no payment of wages (Oladimeji and Aina, 2018). Wages are a significant factor when considering unstable conditions of employment as it is facilitated by the paucity of stable or regular wages (Mckay et al., 2012).

In the same vein, Fudge (2009) added that precarious work condition introduces a loose commitment in employers/employees relationship which might even impair health and well-being of not only the employees but also their families and the society at large. Jobs prospects for psychosocial issues are influenced by the quality of construction work and services; construction technical expertise; prompt payment of work certificate; the cost of construction labour; government policy; bad weather; natural disaster; and availability of safety equipment (Table 1).

Table 1. Factor influencing construction firms viability related to PCEW

	14 PCEW related factors	The five psychosocial issues				
		Job Characteristics	Role in Organisation	Social Aspects	Job Prospects	Organisational factors
1.	Quality of construction work and services (Rumane, 2017)		✓		✓	✓
2.	Quality of work and services (Jiang, 2009)		✓	✓	✓	✓
3.	Availability of Skilled labour (Hiyassat et al., 2016)					✓
4.	Employees' Satisfaction (Nudurupati et al., 2007)	✓	✓	✓		✓
5.	Availability of Artisan and craftsmen (Awe, 2006)					✓
6.	Construction technical expertise (Alzahrani and Emsley, 2013)				✓	✓
7.	Number of high performing professionals (Oladimeji, 2019)	✓	✓		✓	✓
8.	Project organisation structure (El-Mashaleh et al., 2007)		✓	✓		✓
9.	Bad weather and natural disaster management (Alinaitweet al., 2007)				✓	✓
10.	Incident rates (Odeyinka et al., 2005)	✓	✓	✓		
11.	Government policy (Bala et al., 2009)	✓		✓	✓	
12.	Management of construction site labour, plant and equipment (Kuroshi and Lawal, 2014)	✓		✓	✓	
13.	Availability of safety equipment (Ismail et al., 2011)	✓		✓	✓	
14.	Prompt payment of work certificate (Fatoye, 2012)	✓			✓	

2.2.5. Organisational factors

Organisational factors issues are leadership culture such as procedure and policies; management plan and style; and consultation and information on the nature of work (Moe and Pathranarakul, 2006; Bell, 2015; EU-OSHA, 2015). The lower level of organisation effectiveness has been linked to burnout; however, organisation effectiveness can be boosted by effective leadership culture (Wright and Bonett, 1997). Organisation factors psychosocial issues effect on effective leadership culture largely influence the quality of construction work and services; availability of skilled labour artisan and craftsmen; employees' satisfaction; the number of high performing professionals; project organisational structure; bad weather and natural disaster management; and availability of safety equipment (Table 1).

It is important to subsequently evaluate the place of these PCEW influencing factors in ICFs' viability amidst other factors influencing the viability of construction firms drawn from the extant literature.

3. Research Method

3.1. Sampling method and response rate

Indigenous construction firms chosen for this study could have been from construction firms registered with federal or state governments or those involved in non-government jobs. Responses were obtained from registered ICFs in order to ensure quality data. These firms have their financial statements regularly audited and prequalified by the Bureau of public procurement in Nigeria to carry out construction works. These criteria exempt ICFs working for state governments and non-government organisations because they do not meet all these requirements.

Thirty-one ICFs who were awarded educational and health institution-building contracts in the year 2005 to 2015 by the Federal Universities and University Teaching Hospitals in three states in South-west Nigeria responded out of the 59 ICFs surveyed. The period selected for the study witnessed the government increased funding of educational infrastructure (Famade et al., 2015). This is also a reason for the choice of ICFs working in education and health institutions. The South West region of Nigeria chosen for this study is one of the most developed regions of the six geopolitical zones in Nigeria. From the total of 31 ICFs surveyed, 16, 10 and 5 are from Osun, Ondo and Lagos states.

The choice of Lagos, Ondo and Osun out of the six states was achieved in order of contiguity by dividing the states into three groups: Lagos and Ogun, Ondo and Ekiti, Oyo and Osun. Due to vast physical growth, strategic location and high concentration of ICFs offices, Lagos was selected in preference to Ogun state. Ondo was chosen to represent one of the region's oldest states in preference to Ekiti and the Federal University located there is much larger and older than the Ekiti State Federal University. Osun was chosen to represent one of the newest states in Southwest Nigeria in preference to Oyo.

Three representatives of each firm consisting of the managing director or representative and two construction professionals were selected making a total surveyed of 177 respondents. 65 respondents' questionnaires were however obtained and considered fit for analysis. Thus, a response rate of 36.7% of respondents (staff) was obtained from 53% of the total firms surveyed. Ellhag and Boussabaine (1999), Idrus and Newman (2002), Bala et al., (2009), and Oladimeji (2019) adjudged such a response rate as acceptable in construction management studies.

3.2. Data Collection

Drop - and -collect method was used in places were contractors are actively on-site while personal contact interview was used in areas where there is sparse construction activity. The first section of the study questionnaire provided general information about the respondents and the second part has an outline of 37 variables influencing the viability of ICFs' in Nigeria expected to be rated on a Likert scale of five-point.

Table 2. Mean scores and ranking of factors influencing the viability of ICF

Variable	*Factors Influencing the viability of ICFs (N = 65) (1 = not important …. 5 = extremely important)*	*Bartlett's Test of Sphericity value = 0.0001*		*Kaiser-Meyer-Olkin value = 0.551*
		MS	*Cronbach's Alpha*	*Rank*
V14	Organizational competence/client satisfaction	4.40	0.892	1
V1	Cash for construction work	4.36	0.899	2
V15	*Quality of work and services	4.31	0.893	3
V31	*Quality of construction work and services	4.30	0.896	4
V6	*Prompt payment of work certificate	4.16	0.895	5
V25	*Availability of skilled labour	4.16	0.894	6
V9	Cost of construction material	4.08	0.893	7
V16	*Employee satisfaction	4.06	0.894	8
V17	Reputation of good clients-contractors' relationship	4.00	0.894	9
V26	*Availability of artisan and craftsmen	4.00	0.894	9
V11	Management of construction site Material	3.98	0.892	11
V13	*Management of construction site labour, plant and equipment	3.94	0.895	12
V28	*Government Policy	3.91	0.895	13
V37	*Availability of safety equipment	3.91	0.894	13
V30	*Construction technical expertise	3.86	0.893	15
V27	Procurement practices (The way contract is awarded)	3.84	0.896	16
V8	Cost of construction labour	3.81	0.894	17
V24	Construction work turnover/successful tender rate	3.81	0.894	18
V32	Specialization of contractors work	3.77	0.895	19
V34	*Number of high performance professional	3.77	0.895	19
V10	*Project organization structure	3.73	0.894	21
V12	Predictability of construction cost and time	3.73	0.893	22
V2	Construction profit margin	3.66	0.899	23
V33	Advanced construction technology	3.64	0.894	24
V7	Cost of plant and equipment purchase, maintenance and hiring	3.56	0.892	25
V21	Inflation	3.55	0.900	26
V22	Tax	3.48	0.897	27
V29	*Bad weather and natural disaster management	3.45	0.894	28
V3	Accessibility to loan	3.44	0.896	29
V4	Interest on loan	3.20	0.898	30
V23	Corruption	3.20	0.898	31
V5	Credit purchase of material	3.17	0.898	32
V18	Age of operation	3.17	0.894	33
V35	*Incident rate	3.17	0.893	34
V20	Firm impact on community	3.13	0.895	35
V36	Accident cost	3.03	0.892	36
V19	Firm size	2.92	0.895	37
	Average	**3.72**	**0.897**	

Note: Factors in asterisk (*) are factors that directly influence PCEW

3.3. Analysis method and data Interpretation

A Likert scale of five-point was used to rank the importance of the 37 factors. In order to express views on how important each of the enumerated factors influences the viability of ICFs in the study area, respondents were required to tick the correct column ranging from "not important" to "extremely important" on a Likert scale of "1" to "5". The mean scores were calculated and scale of measurement ranging from "1" = Not important (≥1.00 and ≤1.80) to "5" = Extremely important (≥4.21 and ≤5.00) was used to evaluate each of the 37 factors.

Descriptive and inferential statistics aided by a statistical application package (SPSS) was used in analysing the data. Cronbach's *alpha* values expected range of 0.70 to 0.95 were tested and a cut off of 0.7 was used (Tavakol and Dennick, 2011). This study adopted a value of 0.4 and above for the factor loading to ensure that the factors are significantly reliable (Phillips et al., 2011). To ascertain the veracity of principal component analysis (PCA) for the study, Kaiser-Meyer-Olkin (KMO) test values of above 0.5 and Bartlett's sphericity test (β) of $p < 0.05$ were ascertained. These tests indicate that sufficient correlations exist among variables (Field, 2000).

4. Results and Discussion

4.1. ICFs' Characteristics

The sampled ICFs characteristics showed that construction professionals, contract managers, site managers composition are 36.9%, 20%, and 29.2% respectively. 70% of ICFs have been in operation for at least 10 years, and over 50% of sampled respondents have executed construction work for more than 10 years. 86.2% of ICFs had undertaken construction operations in Nigeria only and more than 50% of them carried out more than eleven construction projects. Out of the number of ICFs that gave details of their annual turnover, 52.3% had annual

turnovers of more than 10 million Naira ($54.6 thousand) while 13.8% had more than 150 million Naira ($815.2 thousand) annual turnovers in 2014. These annual turnover features are notable characteristics of micro and small-scale business enterprises as affirmed by Oladimeji and Aina (2018).

4.2. Ranking of Factors Influencing the Viability of ICFs and the Place of PCEW

The mean score was calculated by adding up the scores of the rank assigned by the respondents on the variable divided by the total number of respondents. This is subsequently arranged in rank order as seen in Table 2. Also, all the Cronbach's alpha value is greater 0.7 which shows acceptable internal reliability (Hair et al., 2014). Based on the recommended KMO and β of above 0.05 and $p< 0.05$, the obtained KMO of 0.551 and β of $p< 0.0001$ is statistically acceptable.

An overview of the MS and ranking of factors influencing the viability of ICFs in Table 2 shows that all the factors had MS that is greater than 2.90 and the average mean is 3.72. This inferred that all the identified factors are at least "important factors" and most of the factors are "very important factors". 14 of the total 37 identified factors influencing ICFs' viability are factors directly influencing PCEW of ICFs (Table 2). This represents 37.84% of the total identified factors. Furthermore, six of the first ten "extremely important" and "very important factors" are factors that directly influence the PCEW. These factors are quality of work/construction work and services, availability of skilled labour, prompt payment of work certificate, employee satisfaction, and availability of artisan and craftsmen. Beswick et al. (2007) noted that the current economic climate creates pressures for construction managers. A significant cause of these is delay or non-payment of work certificate which definitely influence the number of high performing professionals and availability of skilled craftsmen and artisan (Peter et al., 2011). This will, in turn, hamper the promotion and sustenance of a virile psychosocial construction environment and wellbeing of construction workers (Oladimeji and Aina, 2018).

4.3. Principal factor analysis for factors influencing PCEW and the viability of ICFs

The principal component analysis was carried out on the 37 variables determining the viability of ICFs; this is in order to observe the trend of inter-correlations between variables and subsequently group variables with similar features to form a set of reduced factors in accordance to the hidden components in the data. The factor of extraction, correlations, Eigenvalues and interpretations are all obtainable results of the analysis.

The scree plot in Fig. 1 consists of the Eigenvalues and the data points above the inflection point and these are the important components that can be retained for rotation. Eleven components describe 73.75% cumulative variance based on the Eigenvalues of greater than one statistically prescribed cut-off. The retained eleven components as confirmed in Fig. 1 (scree plot) showed components 12 to 37 not included in the rotation because they are not significant. The factors retained are factor one (F1) which explains a variance of 25.05% from the total variance; others are: F2 = 8.77%, F3 = 7.66%, F4 = 5.48%, F5 = 4.96%, F6 = 4.53%, F7 = 4%, F8 = 3.71%, F9 = 3.60%, F10 = 3.10% and F11 = 2.90%.

Variables were grouped based on their factor loadings. The degree of association of a variable with the component and the percentage variance of the component stated by the variable is explained by the variable. This implies that in a component, a variable (V) with the highest factor belongs to that component. The highest factor loading utilised is the loading of a significant value of 0.4 and above. A correlation exists between V10, V11, V12, V13, V19, V30, and V37 as they are loaded onto Component 1 referred to as construction resources. The correlation was identified between V31, V32, V33, and V34, which are loaded onto Component 2 referred to as improved construction method. V12, V14, V15, and V16 show correlations and are loaded onto Component 3 referred to as quality service and satisfactions. A correlation exists between V9, V29, V35, and V36, which all loaded onto Component 4 referred to as health and safety. Correlation was identified between V17, V24, V25, V26, and V30 which are loaded onto Component 5 referred to as availability of skilled labour. V3, V4, V5 and V23 are correlated and are loaded into Component 6 referred to as corruption and loan. V17, V27 and V28 are correlated and are loaded into Component 7 referred to as government policy and procurement. V1, V6, V7, V8 and V9 are correlated and are loaded into component 8 named cash for construction work. V21 and V22 are correlated and are loaded into component 9 referred to as tax and inflation. V20 and V24 are correlated and are loaded into component 10 named firm's impact on the community. V2, V5 and V24 are correlated and are loaded into component 11 named profit margin.

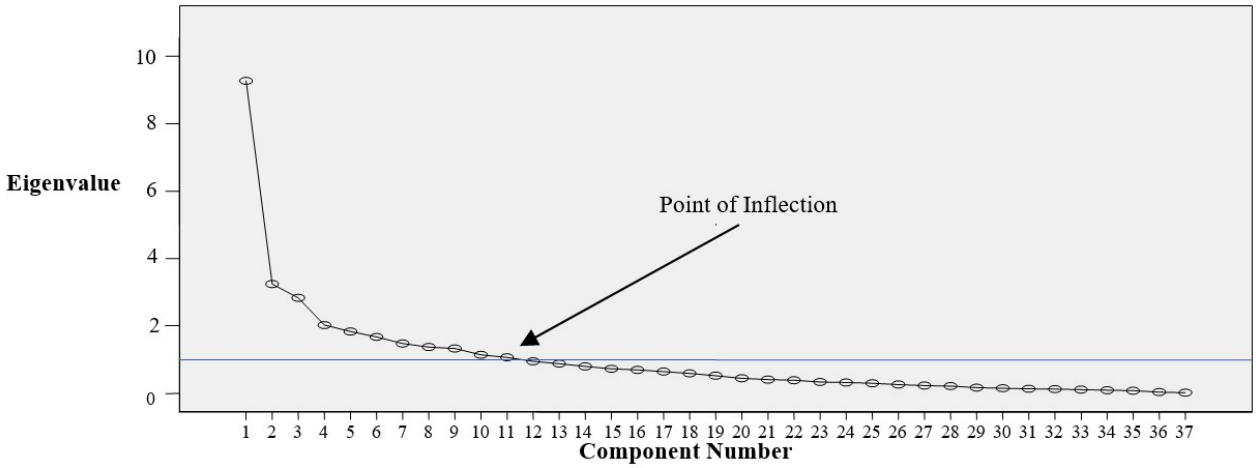

Fig. 1. Scree plot showing Eigenvalue, inflection and component number

Six out of the eleven component factors meant to describe all identified factors determining the viability have at least one high scoring variable that is factors directly influencing PCEW. Also, 8 of the 15 variables loaded on the first three-component factors are variables factors directly influencing ICFs PCEW. These observations further stressed the important relevance of PCEW to the viability of ICFs. To further achieve the specific study aim of evaluating the importance of factors relating to PCEW amidst the 37 factors, the six component factors having factors influencing PCEW with at least 0.5 value factor loading (component factors 1 to 5 and 7 only) are further discussed (Table 3).

Factor 1: Construction Resources

Factor 1 labeled construction resources (component 1), has three variables with at least 0.5 high loadings. They are project organisation structure (0.782); management of construction site labour, plant and equipment (0.749); and availability of safety equipment (0.528). An efficient project organisation structure that prevents conflicts of roles in organisation as a result of a deficiency in skill underutilisation, work control and overcompensation on the job is needed to enhance the PCEW of construction workers thereby improving the ICFs performance (Razzaghian and Shah, 2011; Abbe et al., 2011). Project organisational structure can also be tailored to minimising the social aspects of psychosocial issues that can arise from difficult team cohesiveness due to varying contract service terms and conditions and sudden changes of work programme and location without much notice observed by Lunt et al., (2008). The negative effect of work strain can be cushioned when ICFs put in place a workable team player structure where everyone shares the same value. An organisational culture that put in place a project organisation structure that will enhance the establishment of an effective communication mechanism of psychosocial issues in such a way as to encourage the employee to recommend solutions that will enhance effective culture change is relevant to PCEW of construction workers.

Construction craft workers viewed that effective management of construction site labour, plant and equipment can reduce adverse factors affecting productivity and it has the greatest impact on productivity (Dai et al., 2009). They also observed that a lack of communication among site managers contributes to less productivity performance. For improved labour productivity, issues such as holiday at regular intervals to reduce fatigue and effective work plan to reduce drastically incessant work overtime must be given due consideration (Sandbhor and Botre, 2014; Jarkas et al., 2015). Availability of safety equipment, one of the high loading factors cited in Table 3 is a viable construction factor influenced by organisation, individual workers, supervisors, and workmates. The availability of better purposively and personally designed and applied protective equipment can contribute significantly to better construction work output (Ismail et al., 2011).

Factor 2: Improved Construction Method

Factor 2 labeled improved construction method (component 2) has number of high-performance professionals (0.779). Employee commitment to work usually leads to high performance which fosters job satisfaction (Guest, 2005; Leung et al., 2008). The value of utility added by each worker in a firm is important to the measurement of employee performance by human resources management, this make them consider job performance as a vital performance construct. This implies that high performance professionals add value and utility to ICFs thereby enhancing firms' viability. High performance is highly desirable and an enabling environment that fosters the development, sharing and application of skills and knowledge to achieve this worthwhile goal should be vigorously pursued (Appelbaum et al., 2000; Godard, 2005). This can be achieved through employment security, a good remuneration and profit sharing based on performance, selective recruitment and extensive training, appraisal of performance in connection with reward, training and promotion, and employee involvement (Godard, 2005; AïtRazouk, 2011).

Factor 3: Quality Service and Satisfaction

Factor 3 labeled quality service and satisfaction have the quality of service and work (0.839) and employee satisfaction (0.604). Quality in construction work and services are influence by the role in organisation, job prospect and organisational factor psychosocial issues (Low et al., 2010; Büchel and Mertens, 2004; and Lunt et al., 2008). The drive for quality construction work and services will enhance the efficient management of various roles in organisation. This will foster clear job descriptions, well-assigned responsibility that will enhance optimum skill utilisation. Age and experience which is a feature of role in organisation psychosocial issues can be maximized in the achievement of a worthwhile goal of quality in construction work and services (Low et al., 2010).

Drive for quality construction work and services can inspire and drive construction workers to engage themselves in further and better vocational or professional training that will enhance career development. This will increase their chances and prospect of better job with better pay thereby reducing job insecurity, precarious work contract and low wages (Büchel and Mertens, 2004). Furthermore, organisation leadership culture and management style that promotes quality of construction work and services through provision of incentives, award and reward for exceptional output and starling quality will improve the quality of service rendered by construction workers (Charehzehi and Ahankoob, 2012).

In order to achieve employee satisfaction a high loading variable in this component, a construction system and plan that accommodates and encourages compensation for long hour of work in form of time off during less construction work demand is necessary (Beswick et al., 2007; Lunt et al., 2008). This will minimise stress arising from logistic and ineffective communications across different sites which is a feature of job characteristics psychosocial issues. Employees can experience satisfaction due to their ability to understand and comprehend their respective roles in organisation resulting in enhanced work control and better skill utilisation (Takim et al., 2016). Stressful work conditioned can be cushioned through a work place and family well planned social support system, this will enable construction workers evolve a better coping strategy (Bowen et al., 2013; Lingard and Francis, 2006). This social support can be in form of encouragement that will enhance and promote a sense of self satisfaction in odd times.

Table 3. Rotated component matrix for factors directly influencing PCEW

Variables		*Component*						
		1	*2*	*3*	*4*	*5*	*6*	*7*
		Construction resources	**Improved construction method**	**Quality service and satisfaction**	**Health and safety**	**Availability of skilled labour**	**Procurement practices and policy**	**Communality**
V6	Prompt payment of work certificate							.725
V10	Project organization structure	.782						.761
V13	Management of construction site labour, plant and equipment	.749						.658
V15	Quality of service and works			.839				.878
V16	Employee satisfaction			.604				.694
V25	Availability of skilled labour					.520		.616
V26	Availability of artisan and craftsmen					.775		.788
V28	Government policy						.725	.783
V29	Bad weather and natural disaster				.648			.649
V30	Construction technical expertise	.427				.435		.643
V31	Quality of construction work and services		.464					.849
V34	Number of high performance professionals		.779					.761
V35	Incident rate				.735			.734
V37	Availability of safety equipment	.528						.733

Factor 4: Health and Safety

Factor 4 labelled health and safety has incident rate (0.735) and bad weather and natural disaster (0.648). Incident rates in this context are the rates at which man-made disaster events occur in the construction environment and bad weather and natural disaster are natural not often occurring disaster. Takim et al., (2016) observed that incident rates are influenced by social aspects issues, job characteristics and role in organisation while bad weather and natural disaster affect organisational factor and job prospect psychosocial issues. Respective ICFs should determine how best to manage disaster, security and safety plan, in order to minimise loss and maximise production so as to sustain firm viability. A suggested approach in adverse situation is the implementation of disaster management plan that can enhance the reduction management of critical operations during major construction work interruptions (Takim et al., 2016).

Factor 5: Availability of Skilled Labour

Factor 5 labelled availability of skilled labour has availability of artisan and craftsmen (0.775); and availability of skilled labour (0.520). Sparse availability of artisan, craftsmen and skilled labour is increasingly one amidst the various critical challenges inhibiting the construction industry (Hiyassat et al., 2016; Bala et al., 2009). The service of skill workforce is very essential in meeting the infrastructural need of developing countries usually marked with substantial growth in population. This need requires specific services of artisans and craftsman whose input to a large extent improves the quality and quantity of construction products (Obiegu, 2005; Akindoyeni, 2005). Various factors have been identified as responsible for skills shortages some of which have psychosocial features. Example of such are: construction industry poor image, quality and relevance of training, deteriorating socio-economic status, unrewarded good performance and lack of financial incentives (Windapo, 2016; Aluko et al., 2018). Windapo (2016) observed that there is actually no shortage of manpower but rather a shortage of qualified skilled tradesmen whose professions are more technical and require formal training and certification. Although formal training has been much emphasised as a veritable solution to the acute shortage of skilled manpower yet the place of informal training in achieving this goal is also well recognised (Mbeki, 2014; Sankaran, 2009; Awe et al., 2011). Shortages in artisan, craftsmen and skilled labour affect the quality of workmanship and construction delay which compromises construction cost and time (Offei-Nyako et al., 2014).

Factor 7: Procurement Practices

Factor 7 labelled procurement practices has government policy (0.725). Government policy is a very significant factor in the viability of ICFs. Bala et al., (2009) observed that the top six factors amidst numerous factors inhibiting the growth of local firms are problems created either directly or indirectly by government, an offshoot of factors relating to government policies. Policies that promote PCEW will go a long way in achieving worthwhile goal of construction development. These policies should be made to promote: good remuneration packages of labour with technical and vocational certificates and established skills (Tabassi and Abu Bakar, 2009); construction sustainability in environmental health and protection (Tan et al., 2011), construction health and safety (HSE, 2002 and 2003), minimum wage and employees' entitlements to retirement benefits (Stephen, 2011).

5. Conclusions and Recommendations

This study reviewed literature on improving construction workers psychosocial wellbeing through effective management of construction environment psychosocial issues to improve firms' viability. Fourteen PCEW related factor out of 37 factors influencing the viability of ICFs

were identified. At least one out of every four factors influencing construction firm's viability and more than half of the top 9 factors influencing the viability of ICFs were PCEW related factors. These PCEW related factors influenced by the identified five psychosocial issues in this study are: (1) quality of work/construction work and services influence by role in organisation, job prospects, social aspects and organisational factors psychosocial issues; (2) availability of skilled labour, artisan and craftsmen influence by organisational factor psychosocial issues; (3) prompt payment of work certificate influence by job characteristics and prospects psychosocial issues; and (4) employee satisfaction influenced by job characteristics, role in organisation, social aspects and organisational factors psychosocial issues. These findings underscore the importance and the strategic position of PCEW in the viability of ICFs. Acknowledgement and implementation of the various PCEW related factor is necessary for healthier construction work environment germane to the viability of ICFs.

The study may have been limited in the design of the questionnaires for the survey as they were not initially meant to assess the PCEW of ICFs but rather on factors determining the viability of ICFs. Although it meets the study's aim on identifying PCEW related factors amidst various identified factors known to influencing ICFs' viability. A further study solely based on identifying and measuring the effect of various PCEW factors in all categories of construction environment public and private clients, indigenous and foreign firms is recommended. This will expectedly validate findings in this study and give a more robust perception of the place of PCEW in the viability of construction firms.

References

Abbe, O. O., Harvey, C. M., Ikuma, L. H., and Aghazadeh, F. (2011). Modeling the relationship between occupational stressors, psychosocial/physical symptoms and injuries in the construction industry. *International Journal of Industrial Ergonomics,* 41(2), 106-117.

Abidali, A. F. and Harris, F. (1995). A methodology predicting failure in the construction industry. C*onstruction Management and Economics*, 13(3), 189-196.

Ailabouni, N., Painting, N., and Ashton, P. (2009) Factors affecting employee productivity in the UAE construction industry. *In:* Dainty, A. (Ed) *Procs 25th Annual ARCOM Conference,* 7-9 September 2009, Nottingham, UK, Association of Researchers in Construction Management, 555-64.

Aje, O. I., Odusami, K. T., and Ogunsemi, D. R. (2009). The impact of contractors' management capability on cost and time performance of construction projects in Nigeria. *Journal of Financial Management of Property and Construction*, 14(2), 171–87.

Akindoyeni, A. (2005). Nigerian Building Craftsmen: Which way forward? *Paper presented at the NIOB craftsmen's summit*, 7th July 2005, Yaba College of Technology, Lagos.

Alabi, F. O. (2010). The macroeconomic review of building and construction sector in Nigeria: pre 1980-2006. *In:* Laryea, S., Leiringer, R., and Hughes, W. (Eds) *Procs West Africa Built Environment Research (WABER) Conference,* 27-28 July 2010, Accra, Ghana, 605-13.

Alanjari, P., Razavialavi S., and AbouRizk, S. (2014). A simulation–based approach for material yard laydown planning. *Automation in Construction*, 40, 1-8.

Ali, H. A. E. M., Al-Sulaihi, I. A., and Al-Gahtani, K. S. (2013). Indicators for measuring performance of building construction companies in Kingdom of Saudi Arabia. *Journal of King Saud University-Engineering Sciences*, 25(2), 125-134.

Alinaitwe, H. M., Mwakali, J. A., and Hansson, B. (2007). Factors affecting the productivity of building craftsmen-studies of Uganda. *Journal of Civil Engineering and Management*, 13(3), 169-176.

Aluko, O. R., Omoniyi, S. S., and Aluko O. O. (2018). Perceptions of strategies for minimizing skilled labour shortages for building projects amongst building contractors in Lagos state, Nigeria. *African Journal of Environmental Research*, 1(2), 25-35.

Alzahrani, J. I. and Emsley, M. W. (2013). Impact of contractors' attributes on construction project success: A post construction evaluation. *International journal of project management*, 31, 313-322.

Appelbaum, E., Bailey, T., Berg, P., and Kalleberg, A. L. (2000). *Manufacturing Advantage: Why High-Performance Work Systems Pay Off*, USA: Cornell University Press.

Awe, E. M., Stephenson, P., and Griffith, A. (2011). Identifying and Tackling Problems Militating against youth interest in Construction Crafts Career: Panacea for Effective PPP implementation in Nigerian. *In: Akintoye, A., Liyanage, C., and Renukappa, S.* (Eds) *Procs CIB TG72 and ARCOM Doctoral Research Workshop,* 7-9 October 2011. University of Central Lancashire, UK, 45-60.

AïtRazouk, A. (2011). High-performance work systems and performance of French small-and medium-sized enterprises: Examining causal order. *The International Journal of Human Resource Management,* 22(2), 311-330.

Bakker, A., Schaufeli, W. B., Sixma, H. J., and Bosveld, W. (2001). Burnout contagion among general practitioners. *Journal of Social and Clinical Psychology*, 20(1), 82-98.

Bala, K., Bello, A., Kolo, B. A., and Bustani, S. A., (2009). Factors inhibiting the growth of local construction firms in Nigeria. *In:* Dainty, A. (Ed) *Procs 25th Annual ARCOM conference,* 7-9 September 2009, Nottingham, UK, Association of Researchers in Construction Management, 351-359.

Bell, N. (2015). *Psychosocial issues in construction*. EU-OSHA, Campaign 2.

Beswick, J., Rogers, K., Corbett, E., Binch, S., and Jackson, K. (2007). An analysis of the prevalence and distribution of stress in the construction industry. *HSE (Health and Safety Executive) Research Report (RR)*, 1-81.

Boschman, J. S., van der Molen, H. F., Sluiter, J. K., and Frings-Dresen, M. H. W. (2013). Psychosocial work environment and mental health among construction workers. *Applied Ergonomics,* 44(5), 748–755.

Bowen, P. I., Edwards, P., and Lingard, H. (2013). Workplace stress experienced by construction

professionals in south Africa. *Journal of Construction Engineering and Management*, 139(4), 393-403.

Burtonshaw-Gunn, S. A. (2016). Risk and financial management in construction. Routledge, Taylor and Francis Group, London and New York.

Büchel, F. and Mertens, A. (2004). Overeducation, undereducation, and the theory of career mobility. *Applied economics*, 36(8), 803-816.

Charehzehi, A. and Ahankoob, A. (2012). Enhancement of safety performance at construction site. *International Journal of Advances in Engineering and Technology*, 5(1), 303-312.

Cheah, C. Y. J. and Garvin, M. J. (2004). An open framework for corporate strategy in construction. *Engineering, Construction and Architectural Management*, 11(3), 176-188.

Cordes, C. L. and Dougherty, T. W. (1993). A review and an integration of research on job burnout. *Academy of Management Review*, 18, 621–56.

Dai, J., Goodrum, P. M., and Maloney, W. F. (2009). Construction craft workers' perceptions of the factors affecting their productivity. *Journal of Construction Engineering and Management*, 135(3), 217-226.

Enshassi, A., Al-Swaity E., Abdul Aziz A., and Choudhry R. (2018). Coping behaviours to deal with stress and stressor consequences among construction professionals: A case study at the Gaza Strip, Palestine, *Journal of Financial Management of Property and Construction*, 23(1), 40-56.

El-Mashaleh, M. (2003). Firm performance and information technology utilisation in the construction industry: an empirical study. Ph.D. Dissertation. Gainesville, Florida: University of Florida.

Ellhag, T. M. S. and Boussabaine, A. H. (1999). Evaluation of construction costs and time attributes, in Hughes, W. (Ed) *Proceedings of the 15th ARCOM Conferenc*e. *Vol. 2.* ARCOM, Liverpool John Moores University, 15-17 September 2008, 473-480.

EU-OSHA. (2015). Psychosocial risks and stress at work. European agency for safety and health at work. Retrieved from https://osha.europa.eu/en/topics/stress/index_html

Eurofound, (2006). Fourth european working conditions survey. *European Foundation for the improvement of Living and Working Conditions,* (http://www.eurofound.europa.eu/pubdocs/2006/98/en/2/ef0698en.pdf)

Eurofound, (2007). European Foundation for theimprovement of Living and Working Conditions, *Fourth European Working Conditions Survey*, 2007. Available at: http://www.eurofound.europa.eu/pubdocs/2006/98/en/2/ef0698en.pdf)

Eurofound, (2009). European Foundation for the Improvement of Living and Working Conditions, *Rise in psychosocial risk factors at the workplace*, 2009. Available at: (http://www.eurofound.europa.eu/ewco/surveyreports/FR0909019D/FR0909019D.pdf

Eurofound, (2010). European Foundation for theimprovement of Living and Working Conditions, *Changes over time – First findings from the fifth European Working Conditions Survey* 2010. http://www.eurofound.europa.eu/pubdocs/2010/74/en/3/EF1074EN.pdf

Evans, J. and Gibb, E. (2009). Moving from Precarious Employment to Decent Work, ILO – for the Global Union Research Network, available at: www.sindikalizam.org

Famade, O. A., Omiyale, G. T., Adebola, Y. A. (2015). Towards improved funding of tertiary institutions in Nigeria. *Asian Journal of Humanities and Social Sciences*, 3(2), 83-90.

Fatoye, E. O. (2012). Contributing factors of delay in the Nigerian construction industry: A comparative analysis with other selected countries *In:* Laryea, S., Agyepong, S. A., Leiringer, R. and Hughes, W. (Eds) *Procs 4th West Africa Built Environment Research (WABER) Conference,* 24-26 July 2012, Abuja, Nigeria, 575-587.

Felix BC; Antje M., (2004). Over education, undereducation, and the theory of career mobility. *Applied Economics*, 36, 803–816.

Field, A. (2000). *Discovering Statistics using SPSS for Windows*. Thousand Oaks, CA: Sage Publications.

Fudge, J. (2009). *Measuring Precarious Work: The Institutional Indicators*, IRRA Study Group, Sydney.

Godard, J. (2005). A critical assessment of the high-performance paradigm, In Salaman, G., Storey, J., and Billsberry, J. (Eds.), *Strategic Human Resource Management: Theory and Practice* (Second ed., pp. 147-176). London: Sage Publications.

Goldenhar, L. M., Williams, L. J., and Swanson, N. G. (2003). Modelling relationships between job stressors and injury and near-miss outcomes for construction labourers. *Work Stress*, 17(3), 218–240.

Goulding, J. S., Ezcan, V., Sutrisna, M. (2018). Securing the embeddedness of psychosocial diffusion indicators into the Turkish construction industry: Silence is no longer golden. *Journal of Financial Management of Property and Construction*, (23)1, 90-111.

Guest, D. E. (2005). Human resource management, trade unions and industrial relations, In Salaman, G., Storey, J., and Billsberry, J. (Eds.), *Strategic Human Resource Management: Theory and Practice* (Second ed., pp. 237-250). London: Sage Publications.

Gulghane, A. A. and Khandve, P. V. (2015). Management of construction materials and control of construction waste in construction industry: a review. *International Journal of Engineering Research and Application*, 5(4), 59-64.

Gurcanli, G. E., Bilir, S., and Sevim, M. (2015). Activity based risk assessment and safety cost estimation for residential building construction projects. *Safety Science*, 80, 1-12.

Halim, M. S., Jaafar, M., Osman, O., and Akbar, S. (2010). The Contracting firm's failure and financial related factors: a case study of Malaysian contracting firms. *International Research Journal of Finance and Economics,* 52, 28-39.

Hany Abdelshakour M. Ali, Ibrahim A. Al-Sulaihi, Khalid S. Al-Gahtani, (2012). "Indicators for measuring performance of building construction companies in Kingdom of Saudi Arabia", *Journal of King Saud University – Engineering Sciences (2013),* 25, 125–134.

HSE. (2002) Construction (Design and Management) Regulations (1994). The role of the designer. Construction Sheet No. 41. HMSO, London.

HSE. (2003). HSE reports on construction industry's health and safety performance. Press Release E001:03 (online). Retrieved from: http:// www.hse.gov.uk/press/2003/e03001.html on October 21st 2003

Huang, Y. L. (2009). Prediction of contractor default probability using structural models of credit risk: an empirical investigation, *Construction Management and Economics,* 27(6), 581-596.

Ibrahim, I. I., Githae, W., and Stephen, D. (2014). Indigenous contractors involvement and performance in construction procurement systems in Nigeria, *Global Journal of Researches in Engineering*, 14(1), 1-15.

Idoro, G. I. (2004). The effect of globalization on safety in the construction industry in Nigeria, *Proceedings of International Symposium on Globalization and Construction,* Bangkok, Thailand, 817-826.

Idrus, A. B. and Newman, J. B. (2002). Construction related factors influencing choice of concrete floor systems, *Journal of Construction Management and Economics*, 20(1), 13-19.

International Labour Organisation (ILO). (2011). Policies and Regulations to Combat Precarious Employment, International Labour Office, Geneva.

Ismail, Z., Doostdar, S., and Harun, Z. (2011). Factors influencing the implementation of a safety management system for construction sites. *Safety Science*, 50(3), 418-423.

Jagtap, M. and Kamble, S. (2019). The effect of the client–contractor relationship on project performance. *International Journal of Productivity and Performance Management*.

Jarkas, M. A., Al Balushi, R. A., and Raveendraneth, P. K. (2015). Determinants of construction labour productivity in Oman. *International Journal of Construction Management*, 15(4), 332-344.

Jia, Y. A., Rowlinson, S., and Ciccarelli, M. (2016). Climatic and psychosocial risks of heat illness incidents on construction site, *Applied Ergonomics,* 53, 25–35.

Jiang, B. (2009). The effects of interorganizational governance on supplier's compliance with SCC: An empirical examination of compliant and non-compliant suppliers. *Journal of Operations Management*, 27(4), 267-280.

Kaiser, H. (1994). An index of factorial simplicity. *Psychometrika*, 39, 31-36.

Kim, H. J. and Reinschmidt, K. F., (2006). A dynamic competition model for construction contractors, *Construction Management and Economics*, 24, 955-965.

Kim, A. and Arditi D. (2010). Performance of mbe/dbe/wbe construction firms in transportation projects. *Journal of Construction Engineering and Management*, 136(7), 768-777.

Koksal, A. and Arditi, D. (2004). Predicting construction company decline, *Journal of Construction Engineering and Management ASCE,* 130(6), 799-807

Kuroshi, P. A. and Lawal M. (2014). Study of internal factors affecting labour productivity in medium sized construction firms in Nigeria. *International Journal of Education and Reasearch,* 2(12), 83-92.

Lenin, J. N. (2018). Guest editorial, *Journal of Financial Management of Property and Construction*, 23(1), 2-5,

Leung, M., Chen, D., and Yu, J. (2008). Demystifying moderate variables of the inter relationships among affective commitment, job performance, and job satisfaction of construction professionals, *Journal of Construction Engineering and Management,* 134(12), 963-997.

Leung, M.Y., Chan, Y. S., and Yuen, K. W. (2010). Impacts of stressors and stress on the injury incidents of construction workers in Hong Kong. *Journal of Construction Engineering and Management*, 136(10), 1093–1103.

Feng, Y. (2013). Effect of safety investments on safety performance of building projects. *Safety*, 59, 28-45

Lingard, H. (2003). The impact of individual and job characteristics on 'burnout' among civil engineers in Australia and implications for employee turnover. *Construction Management and Economics,* 21, 69–80.

Lingard, H. and Francis, V. (2006). Does a supportive work environment moderate the relationship between work–family conflict and burnout among construction professionals? *Construction Management Economics*, 24(2), 185–196.

Low, S. P., Liu, J., and Sio, S. (2010). Business continuity management in large construction companies in Singapore, *Disaster Prevention and Management*, 19(2), 219–232.

Lunt, J., Bates, S., Bennett, V., and Hopkinson, J. (2008). Behaviour change and worker engagement practices within the construction sector. HSE (Health and Safety Executive) Research Report (RR) 660, 2008.

Lynch, J. W., Smith, G. D., Kaplan, G. A, and House, J. S. (2000). Income inequality and mortality: importance to health of individual income, psychosocial environment, or material conditions. *BMJ (Clinical Research Ed.),* 320(7243), 1200–1204.

Maslach, C., Schaufeli, W. B., and Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397–422.

Manyena, S. B. (2009). *Disaster resilience in development and humanitarian interventions*. University of Northumbria, Newcastle.

Martikainen, P., Bartley, M., and Lahelma, E. (2002). Psychosocial determinants of health in social epidemiology. *International Journal of Epidemiology,* 31(6), 1091-3.

Mbeki, S. (2014). Causes, effects and impact of shortages of skilled artisans on contractor productivity. *An MSc Dissertation, Department of Construction Management & Quantity Surveying.* Cape Peninsula University of Technology, South Africa

Mbugua, L. M., Harris, P. T., Holt, G. D., and Olomolaiye, P. O. (1999). A framework for determining critical success factors influencing construction business performance, *In:* Hughes, W. (Ed.), *15th Annual ARCOM Conference*, 15-17 September 1999, Liverpool John Moores University. Association of Researchers in Construction Management, 1, 255-64.

Mckay, S., Jefferys, S., Paraksevopoulou, A., and Janoj, K. (2012). *Study on Precarious Work and Social Rights Carried out for the European Commission*, London Metropolitan University, London.

Moe, T. L. and Pathranarakul, P. (2006). An integrated approach to natural disaster management: Public project management and its critical success factors. *Disaster Prevention and Management,* 15(3), 396–413.

Mohammed A. Hiyassat, Montaser A. Hiyari, and Ghaleb J. Sweis (2016). Factors affecting construction labour productivity: a case study of Jordan. *International Journal of Construction Management,* 16 (2), 138-149.

Hiyassat, M. A., Hiyari, M. A., and Sweis, G. J. (2016). Factors affecting construction labour productivity: a case study of Jordan. *International Journal of Construction Management*, 16(2), 138-149.

Nieuwenhuijsen, K., Bruinvels, D., and Frings-Dresen, M. (2006). Psychosocial work environment and mental health-a meta-analytic review. *Scandinavian Journal of Work, Environment & Health,* 32(6), 443–462.

Nudurupati, S., Arshad, T., Turner, T. (2007). Performance measurement in the construction industry: an action case investigating manufacturing methodologies. *Journal of Computer Industry,* 58, 667–676.

Obiegu, M. E. (2005). Nigerian Institute of Building Craftsmen Summit. President's Address, 7th July 2005, Yaba College of Technology, Lagos.

Odeyinka, H., Davison, C., and Olomolaiye, P. (2005). An assessment of factors inhibiting designers from complying with health and safety regulations in their design. in: *Proceedings of the 21st Annual ARCOM Conference*, 7-9 September, SOAS, University of London, 2, pp. 905-913.

Offei-Nyako, K., Osei-Tutu, E., Fugar, F. D. K., and Adinyira, E. (2014). Skilled artisan availability in the Ghanaian Construction Industry. *Covenant Journal of Research in the Built Environment,* 1(1), 1-9.

Oke, A. and Falemu, A. J. (2009). Relationship between building collapse and poor quality of material and workmanship in Nigeria. *COBRA 2009 The Construction and Building Research Conference of the Royal Institute of Chartered Surveyors* (pp. 873-884).

Olateju, B. (1991). Enhancing the contract management capabilities of indigenous contractors: Effective contract management in the construction industry, *The Nigerian Institute of Building, Lagos,* 132-142.

Oladimeji, O. (2017). *Viability of locally owned construction firms in Southwestern Nigeria.* Unpublished PhD Thesis, Nigeria: Obafemi Awolowo University, Ile- Ife.

Oladimeji, O. and Aina O. O., (2018). Financial performance of locally-owned construction firms in Southwestern Nigeria. *Journal of Financial Management of Property and Construction*, 23 (1), 112-128.

Oladimeji, O. (2019). Factors influencing professionalism and the viability of local firms in Nigeria. *Acta Structilia*, 26(2), 142-174.

Peter, A., Divine, A., and Ayirebi, D. (2011). The factors affecting construction performance in Ghana: the perspective of small-scale building contractors. *Ghana Surveyor Journal*, 4(1), 41-48.

Peterson, S. J. (2020). Construction accounting and financial management (4th Edition), Prentice Hall, Upper Saddle River, New Jersey.

Phillips, J., Salamonson, Y., and Davidson P. M. (2011). An instrument to assess nurses' and care assistants' self-efficacy to provide a palliative approach to older people in residential aged care: A validation study. *International Journal of Nursing Studies*, 48(9), 1096-1100.

Randunupura, S. N. and Hadiwattege, C. (2013). Plant and equipment management to minimise delays in road construction projects. Socio-economic sustainability in construction 14-15 June 2013, Colombo, Sri Lanka. 333-342.

Razzaghian, M. and Shah, A. (2011). Prevalence, antecedents, and effects of workplace bullying: A review. *African Journal of Business Management,* 5(35), 13419–13427.

Rossoni, L., Engelbert, R., and Bellegard, N. L. (2016). Normal science and its tools: Reviewing the effects of exploratory factor analysis in management. *Revista de Administração*, 51(2), 198-211.

Rumane, A. R. (2017). Quality Management in construction projects. CRC press, Taylor and Francis group second edition. 6000 Broken Sound Parkway NW, Suite 300 Boca Raton, FL 33487-2742.

Sandbhor, S. and Botre, R. (2014). Applying total interpretive structural modelling to study factors affecting construction labour productivity, *Australasian Journal of Construction Economics and Building,*14(1), 20-31.

Sankaran, P. N. (2009). Corporate social responsibility in skill development: case for traditional artisans in India. *Social Responsibility Network (SRRNet) Uk*. (0904) 1-18.

Schaufeli, W. and Enzmann, D. (1998). The burnout companion to study and practice: a critical analysis, Taylor & Francis, London, Philadelphia.

Semyalo, C., Alinaitwe, H., and Kerali, A. (2012). Causes of financial loss to contractors in the Uganda construction industry *In:* Laryea, S., Agyepong, S.A., Leiringer, R. and Hughes, W. (Eds) *Procs 4th West Africa Built Environment Research (WABER) Conference,* 24-26 July 2012, Abuja, Nigeria, pp. 263-274.

Sidumedi, K S. (2009). An investigation into the relationship between the corporate culture of South African construction firms and performance**.** Retrieved from http://wiredspace.wits.ac.za/handle/10539/7942 on June 28th 2011.

Sobeih, T. M., Salem, O., Daraiseh, N., Genaidy, A., and Shell, R. (2006). Psychosocial factors and musculoskeletal disorders in the construction industry: a systematic review. *Theoretical Issues in Ergonomics Science*, 7(3), 329-44.

Stattin, M. and Järvholm, B. (2005). Occupation, work environment, and disability pension: a prospective study of construction workers. *Scandinavian Journal of Public Health,* 33, 84–90.

Stephen, J. (2011). *Fundamental of Human Resource Management,* University of Groningen Publisher African Studies Centre.

Tabassi, A. A. and Abu Bakar, A. H. (2009). Training, motivation, and performance: The case of human resource management in construction projects in Mashhad, Iran. *International Journal of Project Management* 27, 471–480.

Takim, R., Abu Talib, I. F., and Nawawi, A. H. (2016). Quality of life: psychosocial environment factors (PEF)in the event of disasters to private construction firms. *Social and Behavioral Sciences,* 234, 28–35.

Tan, Y., Shen, L., and Yao, H. (2011). Sustainable construction practice and contractors' competitiveness: A preliminary study. *Habitat International*, 35, 225-230.

Tavakol, M. and Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53-55.

Ulang, N. M., Gibb, A. G. F., and Anumba, C. J. (2010). The communication of health and safety information in construction. *Proceedings of Cib World Congress, [Cib W099 Special Track], Manchester*, 1 May 2010

Wahab, A. B. and Lawal, A. F. (2011). An evaluation of waste control measures in construction industry in Nigeria. *African Journal of Environmental Science and Technology,* 5(3), 246-254.

Wang, O., El-Gafy, M., and Zha, J. (2010). Bi-level framework for measuring performance to improve productivity of construction enterprises. *Construction Resource Congress,* 2, 970–979.

Windapo, A. O. (2016). Skilled labour supply in the South African construction industry: The nexus between certification, quality of work output and shortages. *Journal of human resource management*, 14(1), 1-8.

Wright, T. A. and Bonett, D. G. (1997). The contribution of burnout to work performance. *Journal of Organisational Behaviour*, 18(5), 491–99.

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