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Article abstract

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Workforce Management Decisions in the Construction Industry in the UAE

by

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This study is guided by the need to develop a framework for workforce management decisions in the context of the construction industry in the UAE. A full contextual framework involving all the factors that can possibly play a role in the success of workforce management decisions has been delineated. The factors considered are related to hiring, selection, and quality of workers. The literature has focused not only on the overarching strategies and tactics but also on how day-to-day decision-making occurs while using human resource management for productivity growth of an organization. The data was collected from three construction companies in the UAE. The findings of the study are in line with the findings of previous works.

1. Introduction

Workforce management decisions like hiring, training, and staffing are crucial to any organization since these decisions impact directly on organizational performance (Buller & McEvoy, 2012; Pera, 2019). The direct and potent implications of workforce planning on organizational performance have been documented by several studies (Jiang et al, 2012). Direct linkages exist between organizations' strategies regarding workforce management and performance outcomes, or the ability to create competitive advantage. However, most research has been directed toward the HRM policies that have a direct impact on leadership attitudes, employee motivation, and commitment and performance. But HRM decisions related to workforce hiring, training, and staffing are also important and require equal consideration and merit research (Buller & McEvoy, 2012; Feeney, & Camarena, 2018).

However, there is still a substantial lack of literature and research on understanding the factors that play a role in making workforce management decisions successful. The costs associated with workforce management decisions need to be justified with the resulting quality of output and organizational efficiencies (Scott & Davis, 2015). In today's organizations much of these tasks are carried out with the help of mathematical programming models, which enable arriving at an understanding of optimum organizational needs and skills requirements. However, since most of these mathematical models are deterministic in nature and rely on pre-decided and already known traditional parameters like supply and demand characteristics, they do not capture the contribution and role of new or unknown factors (Abaker, Al-Titi, & Al-Nasr, 2019). It can be said that mathematical models largely fail to take into account uncertainty related to the involvement of many more unaccounted for factors – and thus cannot give optimal or relevant solutions (Van den Bergh et al., 2013). Most models work on oversimplified assumptions that explicitly endeavour to minimize complexity in order to arrive at solutions, but in effect end up being inaccurate simply because they fail to capture the complexity of the real situation.

This lack of accuracy and relevance of mathematical models to predict needs and solutions is a source of concern for organizations. Models may imbibe state-of-the-art user interfaces or provide well-analyzed solutions, but they may still fail because they do not take into account the whole gamut of variables that may be impacting upon the situation that they are dealing with (Sencer & Ozel, 2013). Strategic decisions are based on such inadequate models for the duration of the project, and the fallacy is exemplified when the project employs a transient workforce. Moreover, decision-making tools need to be

tailored to the specific needs of the industry as well as the organization. For example, a workforce management model that is suited to a service industry setting would require factors like back-end service support requirements, service quality monitoring systems, and service delivery modes to be taken into consideration. On the other hand, a manufacturing industry organization would require specific factors like supply and demand, availability of capacity, and optimum utilization of equipment to be taken into account while planning for workforce recruitment or training and development (Scott & Davis, 2015). In any case, workforce planning decisions also need to take into account basic factors like organizational size, organizational capacity, organizational mission and vision, goals and objectives, and organizational commitment to creating valued outputs for its customers (Villarreal et al, 2015). The range of factors is further expanded when taking into account the cross-cultural nature of the business organization or multicultural nature of the available workforce, as is the case in the UAE (Sultana et al, 2013; Smilowitz, Nowak, & Jiang, 2013). Moreover, workforce management decisions are often mired in a trade-off between on-time demand fulfilment and desired quality of workers, and this is especially true in the case of flexible requirements in industries like the construction industry (Lal, 2015).

Mathematical models are unable to capture the complexities inherent in any situations where workforce planning is being implemented as most mathematical models are developed using only basic and few factors. A preliminary review of the available literature pointed to the paucity of research directed at any exploration of the factors that play a role in the effectiveness and efficiency of workforce management decisions in real-world and complex settings (Omrani, Valipour, & Emrouznejad, 2018). Until a full contextual framework involving all the factors that can possibly play a role in the success of workforce management decisions is evolved, mathematical models simulating the interplay of such factors cannot be developed. Such mathematical models are inadequate and undermine the accuracy and relevance of the results that they may predict or decisions that they may encourage the management to take on (Kemp, Mathias, & Raji, 2019; Kougiannou & Ridgway, 2019). The research is therefore guided by the need to evolve such a framework in the context of the construction industry in the UAE. The following research question guide the research.

1.1. Research Question

The study started with a fundamental research question: what are the factors and variables that impact workforce management productivity decisions in the construction industry of the UAE? Corresponding to the research question, the objectives of the study were defined. The first one is to explore the conditions of uncertainty within which workforce management decisions are made in the construction organizations in the UAE and to develop a list of factors that play a role in hiring and selecting the most suited number and quality of workers at the desired time. The other objective is also to develop a framework for making workforce management decisions more accurate and relevant to the context of the construction industry and finally to develop a list of recommendations to be imbibed into any future mathematical models that endeavour to support decision-making for workforce management.

2. Literature Review

Knowledge about operational workforce decisions under uncertainty and effective utilization of the workforce is among the most important knowledge yet; construction enterprises are complex, and workforce labour comes from diverse backgrounds. The need for supervisors to know their workforce has never been more important, and choosing staff to carry out these mind-boggling business capacities requires better proof of what truly drives results (Fragnière, Gondzio, & Yang, 2010). Selecting a workforce under these vulnerabilities speaks to a noteworthy change in the role as well as abilities of HR, making it a crucial and indispensable driver of business development as well as operational productivity all throughout the endeavour (Bhalla, Qazi, & Miralam, 2019). This study puts forth an operational way

to deal with arranging the workforce on both fronts, and indicates how it makes human resource management a more successful business tool. Secondly, operational workforce management is a matter of coordinating supply to demand, and is subject to money related constraints (Higgins, 2007). It is also a business process that aims to expand the commitments as well as the profitability of work inputs in the short-to-medium term, as indicated by particular objectives articulated by corporate strategy.

Workforce administration choices under situations of uncertainty may include contracting, preparing, as well as recruitment, which directly affects the cost, timetable, and nature of work. Scientists have built up a few numerical programming models to advance such choices (Tànfani & Testi, 2012). A large portion of these models are of a deterministic nature, i.e. they depend on surely understood as well as pre-set data parameters, for example, supply as well as demand attributes. Nevertheless, in performance, there is a huge vulnerability in these parameters, which could risk the optimality of arrangements acquired from these models. In addition, they give vital choices to be made over the whole venture length. This can turn out to be inapplicable in practice, which could result in utilization of a short-term workforce since these ventures regularly experience the ill effects of incessant changes in the supply as well as the demand for labourers (Chung, 2019). As is the case in every industry, the operational workforce is the most important part of any enterprise. Construction procedures rely on data as well as the propensity of the individuals organizing and executing the work. (Santora & Bozer, 2015).

Apart from this, in the construction industry, time is considered as cash to proprietors, manufacturers, and clients. From the proprietor's viewpoint, there is lost income by not getting an optimal rate of productivity, income crisis, amplified interest payments, possible loss in the confidence of customers, and negative impacts on brand and reputation. There are similar money-related consequences for clients (Mayo, 2015). Delays in overhauling offices result in working at less than ideal effectiveness, bringing about higher costs for the client. Delays in developing or restoring frameworks adversely influence organizations as well as the public at large (Santora & Bozer, 2015. Delays result in broadened overhead expenses as well as put a smash on basic income. Amplifying venture lengths restrict the constructor's holding limits as well as the capacity to offer additional labour (for example, opportunity cost). Unproductive time administration results in higher work as well as hardware costs. Notoriety for delays is awful for business, particularly in prearranged labour (Mayo, 2015).

Top performing organizations perceived that there is much knowledge required to execute their operations (Choi & Chung, 2016). Furthermore, it was shown that workforce administration choices, for example, procuring, preparing, and staffing, directly affect the cost, timetable, and nature of the work. Researchers in this regard have built up a few numerical programming models to improve such decisions and outcomes. The greater part of these models is of a deterministic nature, i.e. they depend on some pre-set information parameters, for example, free market activity attributes. However, practically speaking, there is noteworthy uncertainty in these parameters, which eventually endangers the optimizations that result from these models (Lattouf & Moataz, 2014). This can turn out to be unacceptable in the projects, which hire a migrant workforce since these projects ordinarily experience successive changes in the free local market activity. Subsequently, the main aim behind reviewing the past literature is to give a guided system about the construction business in the UAE. The literature will likewise satisfy the knowledge gap present in the unregulated construction markets in the UAE. Both construction and labour markets in the UAE are for the most part subjected to migrants who regularly work at several undertakings within short periods of time. Such migrant workforce can bring about challenges in overseeing construction projects and may prompt eccentric rates of truancy, unacceptable profitability, and expanded work costs. Thus, it is imperative to recognize and audit the migrant construction workforce and general workforce management decisions under such vulnerabilities and uncertainties (Akkermans, 2018; Shayah & Sun, 2019).

Looking at the ways to create progress under uncertainty has produced an assortment of various methods including need minimization, minimization of deviations from the objectives, minimization of expenses, and the streamlining of delicate imperatives. A portion of the principal ways to deal with progression under vulnerability include stochastic programming, adaptable and possibility programming, and also incorporating stochastic computer programs (Sahinidis, 2004).

Further, in the case of strategic workforce management, workforce limits are the measured changes as well as the goal in creating effective schedules that adjust to firm as well as individual objectives and imperatives. Fleeting arrangements include deciding time staged asset necessities while roistering includes relegating people to particular timetables. In vital planning, workforce limits are a choice variable. In medium-term arrangement, we look to make close term limit conformities through new hiring (Dixit & Pindyck, 1994). Long haul arrangement includes forming the workforce over an extended period of time and must consider issues such as professional mobility and capabilities. In the accompanying areas, we survey the writing on strategic as well as vital labour force management. We likewise audit the practice-situated research that consider how labour-arranging models have been connected in true modern or administrative associations (Siew, 2014).

The research on vital scope quantification is as a rule separated into two integral approaches. In one approach, the advancement of the workforce is displayed as a stochastic procedure, which develops after some time. This methodology unequivocally models the stochastic way of contracting, turnover, skill development, as well as demand. An exchanging methodology depends on a streamlining worldview in which the goal is to make an arrangement of control choices after some time, which streamlines some measure of framework execution, for example, complete expense, deviation from staffing arrangements, or expected benefits (Zimmermann, 2014). Later work has endeavoured to coordinate instability as well as streamlining, which could be a matter of examination.

As specified, one of the most vital variables in administration development ventures is the prerequisite of acquiring a high-performing workforce. By utilizing the scientific model introduced as a part of this paper, directors will have the capacity to make better choices and overcome the deficiency of high-performing workers in construction ventures. Directors will be able to utilize this model to make good workforce arrangements, including preparing an accessible workforce as well as procurement arrangements in light of costs. In the interim, the director can decrease and control budgets and expenses (Lockwood, 2007).

Generally speaking, it can be seen that building up a system comprising of elements that affect workforce administration decisions in complex circumstances has an immediate effect on associations' capacity to contract and prepare their workforces and concentrate on a higher calibre of work. It is likewise expected that the experiences reviewed through a detailed examination will facilitate smart workforce administration decisions to be made through the on-time enlistment of individuals who have the desired qualities and also fit well within the hierarchical society of the UAE (Daskin, 2010). This research subsequently would add to the scholarship, fill knowledge gaps about components that impact and influence workforce administration decisions, and give data that can tailor more ideal numerical models. All the more importantly, it will help the UAE construction industry by giving data on migrant workforce administration choices that include overseeing an efficient workforce (Krajewski & Ritzman, 1999).

2.1. Research Gap

A significant gap that exists in the literature is how crucial specific decisions are when it comes to managing human resources. The literature has focused on the overarching strategies and tactics but ignored the day-to-day decision making by the managers. It would be crucial to research how day-to-

day decision-making when it comes to human resource management affects the productivity of an organization.

Therefore, the information about operational workforce decisions under uncertainty and how to utilize the workforce effectively is among the most important knowledge. Nevertheless, the construction enterprises are complex, and workforce is from a diverse background. The requirement for supervisors to know their workforce has never been more prominent, and choosing how to staff workers to undertake these mind-boggling business capacities depends on better proof of what truly drives results. Workforce decisions under these vulnerabilities speak to a noteworthy change in the role as well as the abilities of HR, making it a crucial and indispensable driver of business development as well as operational productivity throughout endeavour. This study puts forth an operational way to deal with arranging the workforce on both fronts, and indicates how it makes human resource management a more successful business tool. Secondly, operational workforce management is a matter of coordinating supply to demand, and is subject to money related constraints (Higgins, 2007). It is also a business process that aims to expand the commitments as well as the profitability of work inputs in the short-to-medium term, as indicated by particular objectives articulated by corporate strategy.

3. Theory and Hypotheses

Based on the extensive literature survey we have conceived the following framework that will make workforce management decisions more relevant and accurate in the construction industry in the UAE.

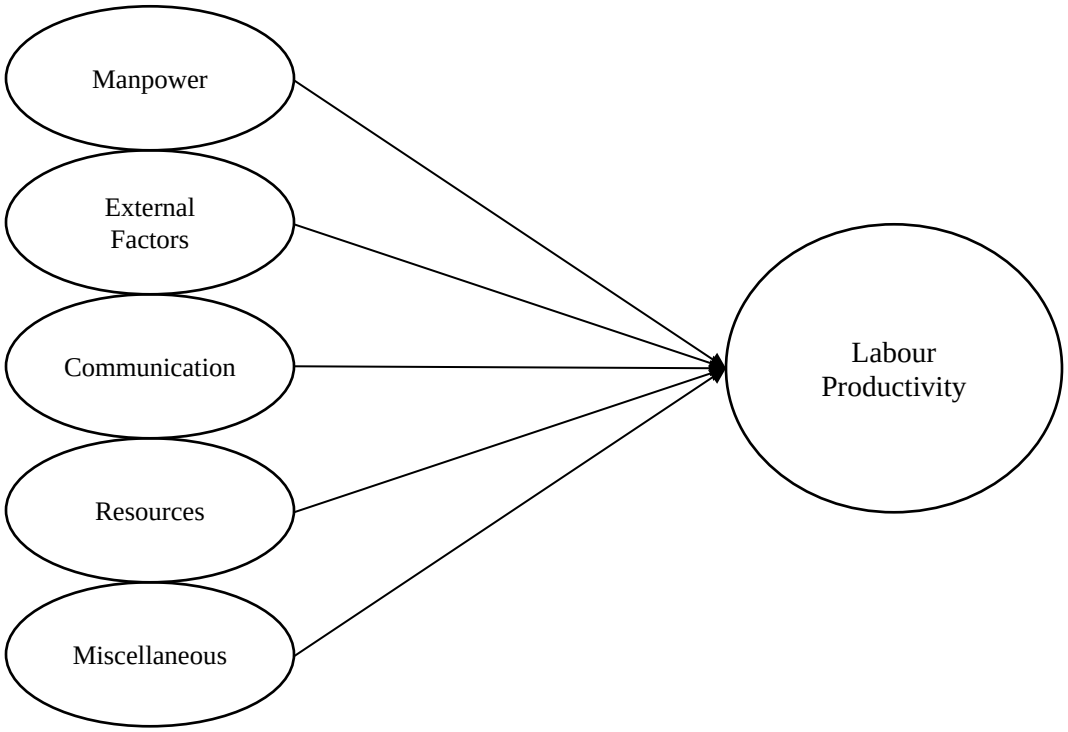

Figure 1 - Research Model: Factors Affecting Labour Productivity in the Construction Industry of the UAE

3.1. Hypotheses Formulation

3.1.1. Relationship between Manpower and Labour Productivity

In line with the literature review, workforce management processes such as recruitment, selection, training, and compensation affect the cost of the organization (Bergh, De Bruecker, Demeulemeester, & De Boeck, 2013). Migrant manpower can bring about great challenges in managing construction projects and can also lead to variations in the profitability of the organization. It is indeed crucial to understand the relationship between manpower and the effect on labour productivity. We anticipate that manpower plays a crucial role in the overall outcome of labour productivity. The reason for our line of thinking is the fact that migrant manpower brings a different skillset with them and at times these skillsets may not be applicable to the task performance. The hiring and training of such manpower would create an additional burden on the organization. Therefore, we have the following hypothesis:

H1: Manpower is positively related to labour productivity.

3.1.2. Relationship between External Factors and Labour Productivity

It is evident from the literature review that external factors affect the flow and range of labour productivity. Workforce administration under uncertainty is a big challenge for the organizations in the highly risky construction industry. In any eventualities the organizations may not be able to complete the project on time and have to bear the additional costs of delaying the project. External factors such as political turmoil, migrant labour, uncertainty of the market, economic slowdown, and demand and supply of labour directly affect the cost, time and nature of work. Hence there is a huge vulnerability attached due to the external factors (Zimmerman, 2014). So our expectation is that there is a direct relationship between external factors and labour productivity. Therefore, we are interested in the hypothesis below:

H2: External factors are positively related to labour productivity.

3.1.3. Relationship Between Communication and Labour Productivity

Diversity of the workforce is not only crucial but it has been approached with care because the success of the organization depends on how they treat a diverse workforce. One of the most important elements of managing a diverse workforce in a country like the UAE is communication. Managing a diverse workforce is a different domain altogether and there are short-term and long-term strategies to deal with the issue of communication (Villarreal, Goldsman, & Keskinocak, 2015). Contemporary organizations are laying emphasis on the communication channels for their workforce. Therefore we believe there is a relationship between communication and labour productivity in the construction industry particularly, and hence we hypothesized:

H3: Communication is positively related to labour productivity.

3.1.4. Relationship between Resources and Labour Productivity

Resources play a prominent role in the management and administration of labour productivity in the construction industry. Although there are many types of resources, we can narrow them down to material, equipment, facilities, and storage methods. Arguments are also made about the availability of resources at the right time (Mayo, 2015). The success and implementation of a project in the construction industry depends purely on the basis of the access and availability of the resources at the right time by the right people. Thus:

H4: Resources are positively related to labour productivity.

3.1.5. Relationship between Miscellaneous and Labour Productivity

Everything can't be covered under a broad heading when it comes to the construction industry. In order to gauge the real picture about the various elements, in terms of labour productivity, we can look into some of the miscellaneous issues like regular supply of water, electricity supply, working conditions, overtime, and accidents at work (Jiang, Lepak, Hu & Baer, 2012). So miscellaneous factors are very crucial in the implementation and successful completion of projects. Hence we argue that there is a strong relationship between miscellaneous factors and labour productivity. Therefore, our hypothesis is:

H5: Miscellaneous factors are positively related to labour productivity.

4. Methodology

In this chapter we have explained the various methods used to collect the necessary data needed to answer the research questions of this project. As we all know, data collection is the most import aspect of any research and collection of the wrong data translates to invalid results, which finally lead to poor conclusions and analysis.

4.1. Sample and Data Collection

The main objective of conducting this research is to identify factors that are uncertain for managers in managing routine operations that impact workforce decision-making. The preliminary data (pilot) was collected through interviews. The recorded versions of the interview can be further used to assess results and develop a range of factors vital to making decisions for employee development in the sample companies. The interviews were used to develop a questionnaire.

The data was collected from three construction companies in the UAE. These were Arabtec Construction, Turner Construction, and Boston construction. The survey was distributed as widely as possible but at the same time, it was also mailed to the respective respondents. Regular reminders were sent to the respondents and we recieved a total of 130 responses out of 150 samples, with a percentage response rate of 86.66%, which was satisfactory for carrying out the study (Flick, 2015).

4.2. Measures

The questionnaire was designed to measure the factors affecting labour productivity. The framework presented in previous section consisted of five factors affecting labour productivity. The scale development process was followed as per previous ones in the field of labour productivity.

The independent variables include Manpower (MP), External Factors (EXT), Communication (Comm), Resources (RS), and Miscellaneous (Misc). Each of them had 3 or more items in the questionnaire. Labour productivity (LP) is the dependent variable. It had 6 items. The variables were measured using a 4-point Likert-type scale where 1 is not applicable and 4 directly affects it.

5. Results and Discussion

Table 1 shows the means and standard deviation for all the variables used in the study.

Table 1 – Descriptive Statistics of the Variables

	N	Minimum	Maximum	Mean	Std. Deviation
MP1	130	1	4	3.02	1.060
MP2	130	1	4	3.10	.914
MP3	130	1	4	2.82	.919
MP4	130	1	4	2.59	.887
MP5	130	1	4	2.58	.887
MP6	130	1	4	2.81	.872
MP7	130	1	4	2.98	1.042
MP8	130	1	4	3.14	.921
EXT1	130	1	4	2.78	.863
EXT2	130	1	4	2.69	.861
EXT3	130	1	4	2.99	.928
EXT4	130	1	4	2.99	.902
EXT5	130	1	4	3.02	.885
EXT6	130	1	4	2.86	.887
EXT7	130	1	4	3.15	.881
EXT8	130	1	4	3.37	.818
EXT9	130	1	4	3.08	.877
EXT10	130	1	4	2.76	.896
Comm1	130	1	4	2.85	.885
Comm2	130	1	4	3.02	.844
Comm3	130	1	4	3.09	.919
Comm4	130	1	4	2.99	.840
Comm5	130	1	4	3.09	.902
RS1	130	1	4	3.05	1.003
RS2	130	1	4	2.85	.873
RS3	130	1	4	3.18	.802
RS4	130	1	4	3.09	.910
RS5	130	1	4	3.07	.855
RS6	130	1	4	3.00	.872
RS7	130	1	4	3.08	.920
RS8	130	1	4	2.98	.853
RS9	130	1	4	2.98	.811
RS10	130	1	4	3.02	.840
RS11	130	1	4	2.79	.946
RS12	130	1	4	2.95	.892

Misc1	130	1	4	3.06	.913
Misc2	130	1	4	3.17	.837
Misc3	130	1	4	3.18	.910
Misc4	130	1	4	3.18	.830
Misc5	130	1	4	3.08	.907
LP1	130	1	4	3.09	.910
LP2	130	1	4	3.07	.855
LP3	130	1	4	3.00	.872
LP4	130	1	4	3.08	.924
LP5	130	1	4	2.98	.853
LP6	130	1	4	2.98	.811
Valid N (listwise)	**130**				

Reliability of the measures was checked using Cronbach Alpha and found to be more than the recommended mark Alpha = 0.947 (See Table 2). In fact each of the variables had a good reliability score of 0.9 and above.

Table 2 - Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.947	.948	46

For validity, we have used the Principal Component Analysis and an exploratory factor analysis (EFA) was conducted. And as expected we extracted six factors whose details are mentioned in Table 3. EFA is one of the powerful statistical techniques used to investigate the relationship between observed and unobserved latent variables. The items with good measurement properties should exhibit high loadings on the factor of which they are indicators and small loadings on the factors that are measured by other sets of indicators. Therefore, EFA provides some evidence of the initial validity of measurement items. Since factor analysis is an iterative process we iterated the factor rotation matrix to get the optimum result. A factor loading of 0.6 was considered to be good and we have retained only those above 0.6. The cumulative variance explained by six factors together accounted for 55.086 % of the total variance with different factor loadings - some are above 0.70 and some are below the given standards. Items which were cross-loadings on other factors were removed for better results. The iterations process continued until we got the clear factor structure for the construct (See Table 4 for details about the factor structure).

Table 3 - Total Variance Explained

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	14.497	31.516	31.516	14.497	31.516	31.516	6.788	14.756	14.756
2	2.805	6.098	37.614	2.805	6.098	37.614	4.321	9.394	24.151
3	2.369	5.150	42.764	2.369	5.150	42.764	3.834	8.335	32.485
4	2.257	4.906	47.670	2.257	4.906	47.670	3.571	7.764	40.249

5	1.728	3.756	51.426	1.728	3.756	51.426	3.467	7.538	47.787
6	1.684	3.660	55.086	1.684	3.660	55.086	3.358	7.299	55.086
7	1.526	3.318	58.403						
8	1.387	3.016	61.419						
9	1.306	2.839	64.258						
10	1.181	2.568	66.826						
11	1.124	2.443	69.269						
12	1.052	2.287	71.557						
13	.963	2.093	73.650						
14	.914	1.987	75.637						
15	.906	1.969	77.605						
16	.791	1.719	79.325						
17	.734	1.595	80.919						
18	.710	1.543	82.462						
19	.662	1.439	83.901						
20	.616	1.339	85.241						
21	.584	1.269	86.510						
22	.571	1.242	87.751						
23	.533	1.159	88.911						
24	.503	1.094	90.004						
25	.494	1.074	91.078						
26	.457	.995	92.073						
27	.415	.901	92.974						
28	.393	.855	93.829						
29	.351	.764	94.593						
30	.343	.745	95.339						
31	.291	.632	95.971						
32	.285	.619	96.590						
33	.272	.592	97.182						
34	.260	.565	97.748						
35	.244	.531	98.279						
36	.190	.414	98.693						
37	.187	.407	99.100						
38	.156	.339	99.439						
39	.135	.294	99.733						
40	.120	.262	99.995						
41	.002	.005	100.000						

42	6.341E-017	1.378E-016	100.000						
43	3.168E-017	6.886E-017	100.000						
44	-1.145E-017	-2.488E-017	100.000						
45	-9.570E-017	-2.080E-016	100.000						
46	-3.114E-016	-6.770E-016	100.000						

Extraction Method: Principal Component Analysis

Table 4 - Factor Analysis for Factors of Labour Productivity

Item Code	F1 - MP	F2 - EXT	F3 - Comm	F4 - RS	F5 - Misc	F6 - LP
Misc_2					.722	
Misc_3					.735	
LP_2						.891
LP_6						.853
LP_5						.938
EXT_2		.765				
EXT_5		.712				
EXT_6		.783				
EXT_7		.618				
EXT_8		.700				
EXT_9		.742				
MP_2	.683					
MP_4	.732					
MP_7	-.701					
MP_8	-.801					
RS_5				.891		
RS_7				-.748		
RS_8				.833		
RS_9				.938		
RS_11				-.623		
Comm_2			-.795			
Comm_3			-.823			
Comm_4			-.785			
Eigen value	**14.49**	**2.805**	**2.369**	**2.257**	**1.728**	**1.684**
Cumulative % variance explained	**55.086%**					
KMO measure of Sample Adequacy	**.607**					

* Misc - Miscellaneous, LP - Labour Productivity, EXT - External Factors, MP - Manpower Planning, RS - Resources, Comm - Communication

5.1. Hypothesis Testing

For testing of the hypothesis, we have used Regression Analysis to check the relationship between variables with SPSS 20.0 VERSION as a tool.

While using data for factor analysis we have also composed factor scores and the same factor scores were used for further analysis of the data. These factors scores represent each one of the factors, namely – Manpower, External Factors, Communication, Resources, Miscellaneous, and Labour Productivity. The independent variable has five-factor scores and the dependent variable has a one-factor score. Therefore, the dependent variable factor was regressed with the independent factors and also summated factors of all the independent variables were also operationalized. The result of the regression equation is given in Table 5.

Table 5 – Regression Analysis

Regression Statistics	
Multiple R	0.648769
R Square	0.420901
Adjusted R Square	0.397550
Standard Error	0.776176
Observations	130

ANOVA

	df	SS	MS	F	Significance F
Regression	5	54.29626	10.85925	18.02517	2.08E-13
Residual	124	74.7037	0.602449		
Total	129	129			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-3.52001E-07	0.068075	-5.2E-06	0.999996	-0.134740123	0.134739	-0.13474	0.134739419
X_MP	0.206057218	0.077625	2.654536	0.008983	0.052416471	0.359698	0.052416	0.359697964
X_EXT	0.229861997	0.074929	3.067728	0.002649	0.081556401	0.378168	0.081556	0.378167593
X_COMM	-0.279958667	0.07555	-3.70563	0.000316	-0.429492498	-0.13042	-0.42949	-0.130424836
X_RS	0.210529612	0.076472	2.75302	0.006792	0.059169604	0.36189	0.05917	0.361889621
X_MISC	-0.02163904	0.068553	-0.31566	0.752795	-0.157324051	0.114046	-0.15732	0.114045971

Dependent Variable (Intercept): Labour Productivity

* Misc - Miscellaneous, EXT - External Factors, MP - Manpower Planning, RS - Resources, Comm - Communication

The regression table shows that the regression model has got a relatively better R^2 value (0.42). This implies the overall model fit and shows a good relationship among the variables. Comparing the beta coefficients, it is clear that the independent variables barring one are significant ($p<0.05$). The earlier studies have also found support for these constructs. We could not find support for Hypothesis 5 which was the relationship between miscellaneous factors and labour productivity. Our understanding

is that miscellaneous factors are aplenty and we could manage to include only a few and these factors although important but may not be seen as a strong consideration by the respondents. The results are not surprising as miscellaneous factors may not sound too important for companies and that is why they are labeled as miscellaneous.

6. Conclusion and Recommendations

This is the final part of the research that provides detailed information about the entire scope, and helps in understanding the way research objectives have been achieved. Moreover, this section also offers recommendations about potential attributes that an organization can apply to attain valuable results.

This study was conducted with the aim of exploring the relationships that exist among the factors of labour productivity. At the outset, we have stated the theoretical and empirical approaches and found these to be compatible with the aim. The findings of the study are parallel to the previous works but we can't argue that it holds true everywhere since it is only confined to the construction industry. Our findings indicate that the key factors of Manpower, Resources, and External Factors are important for labour productivity to increase. The model fit may not be strong, but statistically the results have indicated that there is a relationship among the variables.

Based on the empirical research and findings a few recommendations from the study can be made. Because of the nature of the study, the HR managers and the proprietors of the construction companies have to pay attention to Manpower at the early stages of recruitment and training. The external factors can't be controlled so easily, therefore proper training of the workers and availability of information in time would help organizations. This way they can check the uncertainty to a great extent. Organizations can use direct and indirect methods of communication to ensure the smooth function of the day-to-day activities of the work. The proprietor and the client risk can be minimized with the sharing of information about resources.

6.1. Limitations of the Study and Future Research

Research limitations arise in every study and a researcher needs to be aware of them from the very beginning so that critical aspects can be managed (Bryman & Bell, 2015). Conditions may occur in the study that bring doubts to the overall validity of the research results. Some attributes can become an issue while carrying out the research, and must be managed properly so that the research is carried out in a smooth manner. In the present study, some crucial attributes are given emphasis that mainly act as a limitation for the researcher and must be managed in a way so that the entire work can be completed on time. The other issue could arise in terms of managing the costs that result from limited accessibility of reference materials or scholarly resources.

Due to financial constraints, the size and homogeneity of the research sample was limited, which limits the overall statistical significance and generalizability of the research. It is crucial that the utmost attention is given to managing quantitative research in order to arrive at generalizable results. Another limitation of the study is that the cross-sectional differences in the data are from only three firms and in the UAE context. Though we examined the factors based on the literature, we feel there are many more factors which influence and affect labour productivity. These factors can be explored in detail in future studies. This study has focused only on the construction industry but future work can also take into consideration other industries like manufacturing and the service industry. Future studies should also take into account the self-reporting nature of the respondents.

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