

Construction workers Motivation and Skill Development: A strategy for improving Construction Productivity in Sri Lanka

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Abstract: Human factors are important sources of increasing efficiency and performance in the construction industry which contribute to project success. Human resource today has a strategic role for productivity increase in construction projects and this makes it superior in the industrial competition. This stems from the limited success in terms of completing projects in time, within approved cost and to a satisfactory quality. The study examines motivation and skill development factors as a strategy for construction productivity in Sri Lanka, whilst there are other human behaviour factors that could influence construction productivity. Descriptive research methodology using questionnaires to collect data was used. 35 behaviour factors of motivation and skills development were identified and investigated for improved construction productivity. The results showed that although all 35 factors are very significant and are more likely to exert a higher influence towards positive behaviours, there were 4 factors found to be extremely significant and the highest ranked factor was a motivation factor; on-time payment. Only one skill development factor was identified as extremely significant according to respondents' perspective. Conclusions drawn from this study are that when the 35 sub factors are present in a construction environment, they influence worker behaviours, thus improving construction productivity. Therefore it may be necessary to consider these factors as a

way of increasing success and productivity. Investigating these factors could thus be seen as a way of unlocking human potential to enhance productivity because these factors reinforce behaviour that in turn contributes to project success.

Keywords: Skill development factors, motivation factors, construction productivity

Introduction

Improving and enhancing construction productivity was the most challenging issue in the construction industry during the last decade. Human resource is an important factor in the development of the construction industry and improve construction productivity. The concept to link human behaviour factors with the success or failure in construction projects has been researched extensively. For example Steyn, Basson, Carruthers, Krugar, Pienaar, Van Eck and Vissar (2009:215) identified that people are important in a building construction project environment and add, –Many projects have revealed frustration caused not by deficiencies in the methodology or poorly constructed schedule methods, but rather by the people involved in the project.

Today the construction projects based on project objectives, strategic goals, work plans, budget, time, technology, policies, what are not being focused on are the human behaviour factors (Orando, 2013). The performance of the people who involve in a construction project is affected by number of

factors and usually linked to the performance of time, cost, quality, work pressure, safety measures. Lack of safety, lack of skills, lack of quality of materials, lack of wages, communication barriers mainly create psychological stress on the workers. Therefore human behaviour factors are critical sources in increasing performance and efficiency in the construction industry which contribute to the project success.

According to Parkin et al, (2009:107) motivation may only improve construction productivity if the worker has the abilities and skills needed for the job. This would emphasize that both skill and motivation factors are major requirements for influencing positive behaviors for the construction productivity. For example an unskilled worker, although motivated may not have the required ability to perform well and improve construction productivity.

Though there are many human behaviour factors which influence the construction productivity, the main aim of this study is to determine the influence of motivational and skill development factors on construction productivity in Sri Lanka. To achieve this, the study sought to investigate the perception of respondents regarding the influence of motivation and skills development factors on construction productivity. Thus, it is necessary to identify and investigate human behaviour factors as a way to unlocking human potential to enhance productivity. These factors may reinforce behaviour that in turn contributes to project success.

Literature Review

Construction industry is an essential contributor to the process of development of the built environment. An enhanced productivity has a positive effect on the Gross Domestic Product (GDP) of every country. The immense size and the significance of the construction industry to the economies of most countries, its productivity is one of the

controversial factors (Otalı M and Ujene, 2015). Productivity has been an essential contributor to success, because its direct translation into cost savings and profitability (Mojahed, 2005). Therefore it is evident that the construction productivity links with the success or failure of the construction projects.

According to Gratton (2003) in the 21st century, the new sources of sustainable competitive advantage for organizations are people at the centre, because of their talent and creativity, their inspiration and their excitement that give organization a competitive advantage. Human capital therefore is a big asset for success of any organization. Human factors are the driving forces behind project success. When there is no motivation and no respect for human factors the project would be fail. When people are in conflict or forced to fit into processes, the tremendous opportunity is lost but when intellectual and emotional needs are met, enormous human energy and productivity are created (Wong, 2007).

The term motivation is derived from the Latin word 'movere', meaning; to move. Motivation is a concept used to explain the action of an organism to direct the behaviour (Petri, 1981). Some researchers generally regard motivation as a force and may attribute the force to availability of rewards. The presence of a 'reward' must be some reason for the workers to be motivated. Usually the reward may be a positive outcome or an avoidance of a negative outcome (Parkin et al, 2009). Construction productivity largely depends on construction labor force and their creativity and efforts and construction productivity may not be achieved without good human management practices, which motivate construction laborers (Chan and Kaka, 2007). Motivation factors may vary from worker to worker; different workers may be motivated by

different motivational factors and strategies, which, may improve construction productivity (Jason E. Barg et al,2014). According to Jarkas et al,(2015:165-194) critical motivational factors affect productivity and they were identified as related to incentives (Payment delay and lack of financial incentive scheme), related to work environment and related to management (unrealistic scheduling, performane,incompetent supervisorsandshortage of materials on site). Therefore this study aims to determine the influence of motivational factors which may vary from worker to worker in the construction projects. Job satisfaction is usually related to the motivation and may be related to the personal feelings of achievement, workers' job satisfaction is correlated with the breadth of their work abilities, which play an important role in the workplace (Shevchuk, Davis, S.N; 2019).

Erasmus et al (2016) indicate that the task given should be relevant to the job that the worker performs, it implies that the training experiences by the worker directly relates to the duty and tasks performed in the job situation, so this relationship motivates the worker to train and eventually perform better.

According to Kazaz et al, (2008) ineffective management is the major cause for poor construction productivity rather than unmotivated or unskilled workers. This would suggest that both motivation and skill are requirements for improving construction productivity. An unskilled worker although motivated does not have ability to perform well to contribute to project success. From management perspective, motivation is important along with the workers abilities (Vroom and Deci, 1970).

Skill is important in work situations, it may allow a worker to study work details in

order to understand the work properly. With the necessary skill, a worker may evaluate the alternative processes of performing the task (Hackman & Oldham,1980). According to Kazaz et al, (2008) construction workers in developing countries have low level of education and are generally unskilled. Therefore it is necessary to train construction workers to acquire skill in order to improve the onstruction productivity. Contractors need two types of training to develop their capacity and efficiency; management skills and technical skills training. The technical skills such as formwork, masonry work, concrete work and steel work could be acquired through on job training programmes. Management skills on the other hand, are required when contractors take on more complex tasks as they need to read and interpret drawings, manage their risks, financial control, bids for contracts and train the wokforce (International Labor Organization, Building, Civil Engineering and Public Works Committiee, 1983). Hewage and Ruwanpura (2006) identified workers issues in the construction industry of Canada. The results of that study indicate that worker motivation and worker training are required to improve skills such as management, communication and problem solving. This also may suggest that worker skills are important to sharing information and problem solving in order to improve productivity.

According to Isabriye and A.K (2018), a good educational background in construction and skill attitude of a worker is very important for work productivity improvement in South Africa and it also envisaged that the construction project organizations could incorporate the identified skills in their organizations to build capacity and that government could also use the identified factors in the strategies and policies for skill development.

Construction workers should be trained and educated by contractors on their roles and precautionary measures they have to take while doing various activities in site. Construction workers are given the chance to get actively involved in the enhancement process, then it becomes an incredible source of motivation. Construction clients should stimulate the safety of workers by adding extra clauses which ensure the safety in practice (Risath A.L.M , Sivatharasan S; 2017).

The important studies mentioned above suggest that skill factors such as supervision , experience and training on the job may influence worker skill for improving construction productivity. When these factors are lacking, skill may lack. These training skills may enable workers to be skilled to share knowledge at work, to solve work problems and to plan and work independently. The training and learning experience by the worker directly relates to the duties and tasks performed in the job situation and it is the relationship that motivates the worker to train and eventually perform better. Therefore it is evident that the motivational and skill development factors directly contribute to the success or failure of the project in order to improving construction productivity.

Methodology

According to Leedy and Ormrod (2002) it is necessary to identify the human behaviour factors influencing construction productivity. There are many behaviour factors influencing construction productivity but this research was limited to construction workers' motivational and skill development factors in construction industry. The research covers both public and private sector work, building projects and civil engineering work within Sri Lanka. The population consists of construction

operatives in the construction industry in Sri Lanka. The targeted sample consists of contractors, consultant professionals, construction workers, totalling 100 in number, examining the construction workers' situation as it was, a descriptive survey technique was employed to gather data from construction industry operatives. These samples have been obtained purposively as per these ratios; Projects Managers (15%), Architects (8%), Civil Engineers (19%), MEP Engineers (13%), Quantity Surveyors (27%), Safety Officers (4%) and others (14%). It is presumed that, the whole population of construction operatives are geographically widely dispersed.

The research design is based on knowledge gathered from extensive review of literature on motivation and skill development factors and case studies of similar researches. The data obtained was evaluated using a Likert scale of one to five as developed by Kazaz et al (2008), where one represent strongly disagree and five represent strongly agree. Thirty five factors were developed to measure construction workers' perception with regard to identified motivation and skill development factors. Two statistical methods were used to analyse the data provided by the questionnaires. First was to acquiring percentage values by the frequencies of the answers received and second is to calculate a relative importance index (RII) of the motivational and skill development factors. A combination of this methodology, using the Statistical Package for the Social Sciences (SPSS), was applied in this research.

Table 1. The evaluation scale for the data

Level of significance	Level of importance	Scale value
Not Significant (NS)	Not Important (NI)	≥ 1.80
Somewhat Significant (SS)	Somewhat Important (SI)	$1.80 \leq 2.60$
Significant (S)	Important (I)	$2.60 \leq 3.40$
Very Significant (VS)	Very Important (VI)	$3.40 \leq 4.20$
Extremely Significant (ES)	Extremely Important (EI)	$4.20 \leq 5.00$

Analysis

The data from the results of the motivational and skill development factors, which influence construction productivity in Sri Lanka are described below.

The results of motivational behaviour factors significance level is presented in Table 2 below. Using the Table 2 evaluation scale presented and adapted from Kazaz et al. (2008:98), 17 motivational behaviour factors were evaluated. Three of the 17 factors identified and evaluated, as shown in the Table 2, were found to be extremely significant (mean index more than 4.20). While 15 of the 17 motivational factors were found to be very significant (mean index of more than 3.40). This would suggest that the 17 motivational behaviour factors are all more than significant and are of the similarity of the sameness, as such they all required and exceptionally important for influencing positive behaviours.

From the literature review it is apparent that motivational factors could influence positive worker behaviour only if workers have the capability to execute work. The development of worker skill and the confidence to accept roles, to perform tasks well are important factors which contribute to positive worker behaviours.

Table 2. Motivation factors

Motivation Factors	Rank in total	Effect level	Min	Max	Mean	SD
On-time payments	1	ES	1	5	4.37	1.056
Being given due value and respect	2	ES	1	5	4.29	0.821
Comfortable work environment	3	ES	1	5	4.21	0.983
Salary	4	VS	1	4	3.99	0.938
Adequate material supply	5	VS	1	4	3.96	0.818
Health & safety at work	6	VS	1	4	3.94	1.077
Quality of equipment	7	VS	1	4	3.93	0.942
Being praised	8	VS	1	4	3.91	0.956
Participation in decision making	9	VS	1	4	3.87	0.886
Rewards/ promotion	10	VS	1	4	3.85	1.069
Money incentives	11	VS	1	4	3.82	1.086
Transport for workers	12	VS	1	4	3.81	1.011
Challenging work tasks	13	VS	1	4	3.76	0.740
Long-term employment contracts	14	VS	1	4	3.74	1.09
Feedback	15	VS	1	4	3.73	0.978
Orientation programs	16	VS	1	4	3.62	0.907
Company staff housing	17	VS	1	4	3.56	1.125

In Table 3 the results of skill development factors' significance levels are presented. One of the 18 factors in Table 3 is shown as extremely significant (mean index being more than 4.20), while 17 of 18 factors are

shown as very significant (mean index being more than 3.40). As per the survey the factors are very important for the influence of positive worker behaviour and none of them be disregarded. The most significant factor was identified as staff self-efficacy (ES- 4.24). The least of the very significant factor was identified as task difficulty (VS- 3.59).

Table 3. Skill development factors

Skill factors	Rank in total	Effect level	Min	Max	Mean	S D
Staff self-	1	ES	1	5	4.24	0.701
Staff ability to accept	2	VS	1	4	4.03	0.847
Work quality	3	VS	1	4	3.99	0.844
Staff learning at work	4	VS		4	3.98	0.754
Staff self-esteem	5	VS	1	4	3.97	0.784
Work scheduling	5	VS	1	4	3.97	0.784
Staff training	7	VS	1	4	3.94	0.875
Basic educational level	8	VS	1	4	3.94	0.808
Work econo	9	VS	1	4	3.89	0.914
Staff work	9	VS	1	4	3.89	0.914
Literacy level of	11	VS	1	4	3.89	0.819
Staff monitoring	12	VS	1	4	3.86	0.889
Interesting work	13	VS	1	4	3.83	0.928
Task variety	14	VS	1	4	3.77	0.868
Task significan	15	VS	1	4	3.74	0.957
Use of own knowledge &	16	VS	1	4	3.72	0.934
Opportunity to work independen	17	VS	1	4	3.71	0.924

Task difficult	18	VS	1	4	3.59	0.894
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The important aspects of the 4 extremely significant out of 35 sub factors as ranked in Table 4 as reviewed below.

Table 4. The ranking only of the extremely significant behaviour sub-factors

Factor	Rank in total	Effect level	Mean
On time payment	1	ES	4.37
Given due value & respect at work	2	ES	4.29
Staff self-efficacy	3	ES	4.24
Comfortable environment	4	ES	4.21

The results indicate that on-time payment (ES-4.37) was ranked as the most effective motivator influencing positive worker behaviour towards construction productivity in Sri Lanka. On-time payment meets physiological needs that are the most basic requirement of people and gives esteem in a society. Despite Herzberg's argument that money is not a satisfier and thus not a motivator. In these studies, it is supported the contention that money is one of the most powerful motivators of construction workers and timely payment is the primary principle of any working agreement.

Being given due value and respect at work has a mean index of 4.29, evaluated as an extremely significant sub factor as shown in Table 4 above. Being given due value and respect at work ranked second of the most important sub factor for influencing positive worker behaviour for improving construction productivity. And it was identified as a social or belonging need, and one of the middle hierarchy needs which are important since a motivated employee may

consistently strive towards an attainable goal or set of goals. The study results show that being given due value and respect at work is an extremely significant factor for improving construction productivity. Self-efficacy has an impact on an individual's emotional reaction and thought pattern. It can also be described as a function of self-belief with which individuals can accomplish a task (Bandura,1986). It can be said that self-efficacy will most definitely lead to increased performance and productivity. The study results also show that staff self-efficacy is an extremely significant factor and it is the third most important factor for improving construction productivity.

Safety and comfortable environment has a mean index of 4.21, evaluated as an extremely significant motivational factor as shown in Table 4 above. The efficiency of a human worker depends on the working condition and the skill level of the worker. The working conditions, in turn depend on the atmospheric condition which is a combination of site location and thermal environment. Uncomfortable conditions in construction work site, restrict the ability of workers to function to full capacity and can lead to lowered job satisfaction and increases in illness symptoms. Therefore it is evident that the safe and comfortable working environment directly affects the positive worker behaviour towards construction productivity.

The last section of the questionnaire concerned any comments the respondents wished to make regarding the research study. There were only twelve comments received and they are summarised. The respondents gave the perception that although the study of worker behaviour for construction productivity is extremely important, construction industry is not adequately employing success factors in construction work sites to ensure that

projects are completed successfully. The respondents identified good company values, visions of companies, good social treatment, good co-worker relationship as important to influencing positive worker behaviour for improving construction productivity. The 35 sub factors cover most aspects of these proposed behaviours for improving construction productivity. The comments suggest that the factors and behaviours identified in the literature and subjected to evaluations and investigations are all important for improving construction productivity. The above comments further suggest that although the factors and the behaviours are important, they are not being brought into a work situation in the construction industry. The comments generally support the results of this research and are to reach conclusions and make recommendations from the study.

Conclusion

Improving construction productivity in order to complete the project on time, within budget and to the desired quality, is a major concern of the construction industry in most of the developed countries. For the improvement to be realised, it was necessary to do the research on the human behaviour factors for improving construction productivity with the aim of identifying motivational and skill development factors which impact on positive worker behaviour for improved project performance outcomes, such as improved quality productivity.

The study focused on construction workers' motivational and skill development factors as a strategy for improving construction productivity in Sri Lanka. The research identified 35 motivational and skill development factors that could be incorporated in a workplace environment to improve construction productivity. The research is limited to human work skill development and motivation factors

in construction; though there are other human behaviour factors that influence construction productivity. Analysed data showed that on-time payments, given due value and respect at work, staff self-efficacy and safe and comfortable environment are extremely important factors for construction productivity in Sri Lanka.

Motivation provides the force and desires as well as the wish and determination which activate worker's action towards work. As such motivation is more likely to influence the desire and self determination to improve construction productivity through worker positive behaviour, provided the workers are skilled to perform tasks. The motivating workforce can be best achieved by improving motivating factors and eliminating demotivating ones simultaneously, and the increase of motivation factors should always be accompanied by decrease in demotivation. At this point it is essential to distinguish that, if significant demotivators remain it will be a vain attempt to try to nurture motivating factors. Skill development of workers enable workers to be motivated and to have capability, willingness and confidence to accept work delegation for the proper execution of work tasks. Skill development of workers enables worker to be motivated and to have compatibility with work, willingness and confidence to accept responsibility and accountability for the execution of work tasks. Such work skill development should be done through worker training and through good communication. It is important for providing career growth and development for workers, and also motivates and commits workers to the organisation. Staff's work conditions and welfare involve the nature of tasks and work environment, including treatment of workers.

More importantly, this study identified the knowledge of motivation and skill

development factors and behaviours, which when implemented, may improve productivity. Construction industry practitioners can implement these factors and identify behaviours of their employees to determine whether or not their employees are motivated and satisfied. This observation may give management better insight into the effectiveness of their current management practices in fostering those kind of behaviours which are important. The parameters for determining project success are time, cost and quality, which has been rarely achievable. According to the previous studies this may be because of the human influence factors for improved construction productivity, which were unknown and neglected. To improve the likelihood of improved construction productivity; the project managers and construction managers have to pay attention for worker skill development and good remuneration and fringe benefits in their project implementation regard as a recommendation to put forward to provide some directions for improvement towards construction industry in Sri Lanka.

The construction industry has sometimes been described as adversarial and fragmented because of many stakeholders involved. Issues of dispute and personal conflict may sometimes threaten the improvement of construction productivity. This area of research, despite its relevance and importance, missing from current construction management literature. This study may offer a great potential and a starting point for the study of the attitudes and behaviours of construction workers in construction projects.

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