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Challenges affecting leadership development in the construction industry

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Abstract. The study adopts a data reduction method to examine the presence of any complex configuration among a set of variables on challenges affecting leadership development. A structured survey questionnaire was administered to 111 project managers and construction managers to extract the relevant data, and this produced a relatively high reply rate. After satisfying all the necessary tests of the reliability of the survey instrument, sample size suitability and population matrix, the data was subjected to principal component analysis, resulting in the classification of three new thematic leadership development challenges areas; and were explained in terms of leadership education and training; leadership succession challenge; political instability. These knowledge areas now form the basis for oblique leadership development training requirements in the context of the South African construction industry. The main contribution of the paper is manifested in the use of the principal component analysis, which has rigorously presented an understanding of the complex structure and the relationship between the various knowledge areas. The originality and value of the paper are embedded in the use of contextual-task and conceptual knowledge to expound the three uncorrelated empirical utility of leadership development challenges.

Keywords: Challenges, Factor Analysis, Project Manager, Leadership Development

1 Introduction

Leadership is a long-term process of influencing people toward fulfilling a mission and particular goals of a group or an organisation [1]. Leadership process sets goals and enhances commitment to organisational objectives. Studies have revealed that most of the obstacles facing the construction industry relate to leadership and the lack of leadership development. Appropriate leadership can create an organisational culture that is committed to quality, improves efficiency and productivity of teams, enhancing staff's satisfaction, advancing construction performance, and finally, meeting personal and organisational goals [2]. Moreover, it is essential to note that Leadership development has emerged as an active field of theory building and research, providing

a more scientific and evidence-based foundation to augment the long-standing practitioner interest in the topic ([3]. Also, the construction industry has to do with the coordination of different infrastructure duties; thus it is essential to note that all this has to managed and lead by a fitting leader. According to Mbande [4], the development of any industry hinges on skills development.

The structure of this article is as follows. Firstly, leadership development will be examined to summarise the phenomena and its theories that develop and to ascertain factors that play a role in developing successful leadership. Secondly, we will look into the challenges facing leadership development and delineate different factors whereby we will further present the results in line with the challenges affecting leadership development.

2 Leadership Development in the construction industry.

If one word could describe the principle of construction management, it is responsibility. Thus, project managers are responsible for all that happens in a project. This does not mean that the project leader should or could do everything associated with the project. However, it does mean that they have the ultimate responsibility for the project [5]. To chase success in today's construction industry people will need to tackle workforce skills gaps, swiftly changing technology, demanding customers and unprecedented pressure on productivity. However, if they can, the opportunities are enormous. This is an industry that the 2016 Farmer Review indicated that it must "modernise or die", and effective leaders with a new outlook hold the secret to making that happen [6]. Leadership development focuses on a process of development that inherently involves multiple individuals within the construction industry (e.g., leaders and followers or among peers in a self-managed work team). The construction industry will be more successful if it develops leaders who have an understanding of skills, knowledge and characteristics needed of a project or construction manager [7].

The nature of leadership development is inherently multilevel and longitudinal [1]. Researchers such as Kotter [8] have noted the importance of individual identity in developing leadership skills and expertise as part of the leader development process. Other researchers have examined issues of cognitive and metacognitive skills at the core of leadership potential [9]. Bennis and Nanus [10], noted that leadership development approaches are transitioning from the idea of teaching skills and competencies to teaching values and concepts. This means that leadership development programs must become more intimate and unique to individuals. Jarad [11] recognized that there are nine critical drivers for leadership development which include; long term drivers – developing future leaders, retaining staff, the growth of the company, equip staff for change, and sustained professional development, and short term drivers - strengthen teams, motivate staff, increased efficiency, and increase competitiveness.

Also, Jarad [11] is of the view that construction organisations can develop leadership and management skills by developing a culture of teaching, mentoring, self-study, and frequent job changes. There is the need for a shift in the way project managers function and lead projects, and it is essential for them to develop as leaders to successfully

operate in the increasingly complex working environment of the construction industry [12]. In the fast changing construction industry, there is mounting pressure on project managers to do more with fewer people and less resources. Under such circumstances, the people-side of project management or leadership is vital. The next section articulates the challenges affecting leadership development.

3 Challenges affecting Leadership Development in the construction industry.

There are numerous challenges facing today's construction and project managers, some are new to the construction industry, and some are old, but effective leadership should be one of the priority in overcoming this challenges [5]. Businesses today face several challenges to operate proficiently and sustain competitive advantage, and it is often incumbent upon company leadership to provide the proper direction to help their teams navigate these challenges and adapt appropriately. Without a steady pipeline of skilled individuals with the knowledge, skills and experience to step into leadership roles, or an effective process to identify high-potential employees and give them the needed training to be effective leaders, organisations will be unprepared to handle the changes and challenges of the future [11]. Thus, it is vital for organisations to take serious attention to leadership development. While construction organisations recognise the need for effective leadership development, they face several significant challenges in their efforts to develop future leaders.

Cunningham and Rostron [13] cited the following challenges affecting leadership development amongst organizations; balancing long-term and short-term business requirements, lack of opportunity, lack of a formal structure, Inconsistent buy-in across the organization, lack of support from senior leadership, lack of self-confidence by managers, lack of accountability for the application of new skills and knowledge to the job. Furthermore, Curphy [14] stated that there is a need to have context and relevance when planning for leadership development. Similarly, Todd Macey, president of Vital Learning, says the challenge to leadership development is the fact that organisations do not focus on outcomes or the returns of the development strategy. According to Glesson [15], there is a lack of awareness of the leadership development programs that are accessible. Moreover, the process for being considered for a leadership role is often ad hoc and nontransparent.

Leadership development practices are often fragmented and lack an overall strategy that is embedded within the organisations (Weiss and Molinaro, 2005). Likewise, Cunningham and Rostron [13] stated that inadequate internal resources to deliver Leadership development programs was part of the challenge. In addition, the lack of alignment between business strategy and the leadership development strategy of the organisation. The essence of the challenge with leadership development is that organisations invest heavily in leadership development, but do not necessarily see a real or justifiable return on the investment. One of the main reasons for this is the methodology employed for leadership development [11]. Curphy [14] further simplified the challenges in Leadership Development as; the evaluation problem,

definition problem, the people problem and the content problem. In relation to the evaluation problem, he stated that it is vital for the LD programs to be evaluated consistently, whereby the outcomes focus on the skills, behaviours, competencies and collaboration. Sadly, over the years, researchers have found that L&D programs for leadership development are missing the mark. In the 2016 State of Leadership Development report, 75 % of respondents said more significant innovation was needed in learning techniques used in leadership development programs. Lastly, Glesson [15] denoted that organisations no longer have a leadership challenge but a developmental challenge.

4 Methodology

The above literature review provides a systematic understanding of the recent developments in leadership development challenges. It allows the identification of context to leadership development knowledge areas and research. The review identified twelve (12) leadership development challenges (LDC) specific to the construction industry. Subsequently, a self-administered structured survey questionnaire was used to collect primary data from project managers and construction managers, the principal research question asked was as follows; what are the challenges facing leadership development in the South African construction industry? This study adopted a structured survey approach, whereby 111 project managers and construction managers where sampled to elicit relevant data on Leadership development challenges. Quantitative research makes use of statistical analysis, where findings are conclusive and descriptive [21] Statistical Package for Social Sciences (SPSS) computer software was used to conduct data analysis. Both descriptive analysis and EFA were conducted. More so, the study adopted a convenience sampling approach, which is also referred to as a non-random sampling method. The design is that of an exploratory factor analysis called principal components analysis (PCA). Used in order to gain a purer understanding of the traits, PCA is applied to reduce the proposed dimensions into smaller factors. Yong and Pearce [21] affirm that the main drive for factor analysis is to reduce data based on shared variance so that patterns and relationships can be easily read and comprehended. Factor analysis reduces a large number of variables to a manageable size [22]. Moreover, the analytical tool adopted was aimed to explore the inherent characteristics and relationships between these 12 variables identified. Justification for looking at the LDC variables at this stage is that these variables are firmly rooted in the theoretical literature of leadership development, but it is not clear which of the variables would measure the same underlying effect. In the survey, respondents were asked to rank the relative significance of the 12 LDC variables respectively.

5 Data Analysis

5.1 Factor Analysis (Principal Component Analysis)

According to Field [16] , Badu [17] , factor analysis is useful for finding clusters of related variables and thus ideal for reducing a large number of variables into a more easily understood framework. Factor analysis addressed some pertinent issues relating to the appropriate sample size for undertaking and establishing the reliability of factors analysis [18]. Data were subjected to the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy which recorded a substantial value of 0.671. KMO and Bartlett's measure is used to measure sampling adequacy in the use of factor analysis [17]. The KMO statistic varies between 0 and 1 the value of zero indicates that the sum of partial correlations is large relative to the sum of correlations, indicating dispersion of pattern of the correlations and therefore factor analysis is likely to be inappropriate [19]. A value close to 1.00 indicates that patterns of correlation are relatively compact and so factor analysis should yield distinctive and reliable factors [17]. However, the literature suggests that the KMO value should be greater than 0.50 if the sample size is adequate [20] & [18] Subsequently, as presented in Table 1, the KMO measure of this study obtained a high value of 0.671 suggesting the adequacy of the sample size for the factor analysis. The Bartlett's test of Sphericity was also significant suggesting that the population was not an identity matrix.

Table 1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			.671
Bartlett's Test of Sphericity		Approx. Chi-Square	240.046
	Df		66
	Sig.		.000

After fulfilling all the necessary tests of the reliability of the survey instrument, sample size adequacy and population matrix, the data were subjected to factor analysis using principal component analysis (PCA), with varimax rotation. Earlier to principal component analysis, the communalities involved were first established. Communality illustrates the total amount an original variable shares with all other variables included in the analysis and is very useful in deciding which variables to extract finally. The average communality of the variables after extraction was above 0.60. The standard rule about communality values is that; extraction values (eigenvalues) of more than 0.50 at the initial iteration indicates that the variable is significant; and should be included in the data for further analysis or otherwise removed [17]. The eigenvalue and factor loadings were set at common high values of 1.00 and 0.50 respectively [18]. Utilizing the latent root criterion on the number of principal components to be extracted suggests that three components should be extracted as their respective eigenvalues are greater than one.

As demonstrated in Table 2 and supported by the scree plot in Figure 1; Three (3) components with eigenvalues greater than 1.0 were extracted using the factor loading

of 0.50 as the cut-off point. The total variance revealed by each component extracted is as follows: The first principal component (component 1) accounted for 25.35 % of the total variance while the second principal (component 2) component, explained 12.94% % of the remaining variation not explained by the first component. Component 3 accounted for 10.33%. The cumulative proportion of variance criterion, which says that the extracted components should collectively explain at least 45% of the variation, shows that the three extracted components cumulatively explained 48.63% of the variation in the data set. Scores are numbers that express the influence of an eigenvector on a specific sample.

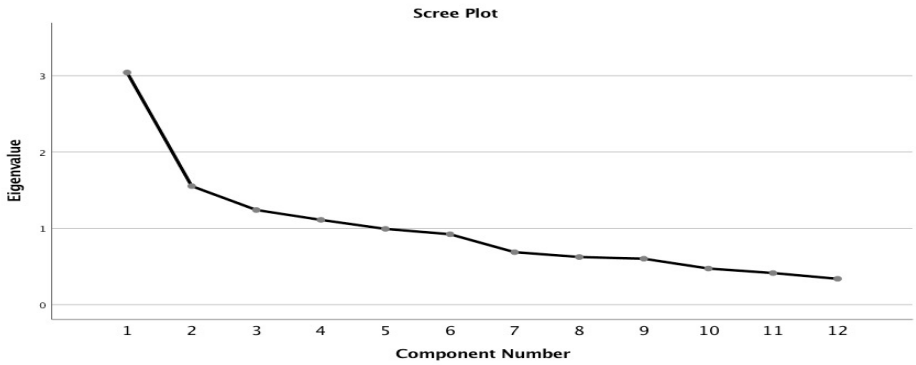

Figure 1: Scree Plot

	Initial Eigenvalues			Extraction sum of square loadings			Rotation sum of squared loadings		
Component	Total	% of variance	Cumulative %	Total	% variance	Cumulative %	Total	⅌ variance	Cumulative %
1	3.042	25.352	25.352	3.042	25.352	25.352	2.202	18.348	18.348
2	1.553	12.942	38.294	1.553	12.942	38.294	2.028	16.903	35.251
3	1.240	10.336	48.631	1.240	10.336	48.631	1.605	13.379	48.631
4	1.111	9.256	57.887						
5	.992	8.270	66.157						
6	.922	7.687	73.844						
7	.687	5.725	79.569						
8	.624	5.201	84.770						
9	.602	5.013	89.784						
10	.473	3.943	93.727						
11	.414	3.450	97.176						
12	.339	2.824	100.000						

Table 2. Rotated component matrix

The ability to interpret of results PCA can be enhanced through rotation [18]. The rotated factor solution is displayed by default and is essential for interpreting the final rotated analysis. Rotation suggests the behaviour of the variables under extreme conditions and maximizes the loading of each variable on one of the extracted factors while minimizing the loading on all other factors and it is best to factor output solutions for interpreting factor analysis. Table 3 presents the results of the rotated component matrix of the PCA.

The next stage involved the analysis of the presence of any complex structure among the variables. A complex structure is said to be present when a variable has a factor or component loading higher than 0.50 on more than one component. Loadings reveal the influence of each original variable within the component. A check on Table 2 shows that all three components had more than one variable loading on them, thus resulting in the keeping of all the three components. What remains is the interpretation of the three principal components extracted. It is instructive to note that the original 12 variables have been summarized into three new uncorrelated variables.

Table 3. Rotated component matrix

	Component		
	1	2	3
Lack of skills	.789		
Lack of training	.763		
Inexperience	.688		
Ineffective organizational culture	.602		
Lack of opportunity		.720	
Lack of incentives		.676	
Lack of self confidence		.627	
Diversity in society			
Unstable political environment			.654
Racial divide in the workplace			.569
Autocratic management			.551
Educational background			

Extraction method: Principal component analysis
Rotation method: Varimax with Kaiser normalization

6 Discussions

Based on the analytical examination of the inherent relationships among the variables under each component, the following interpretation was deduced to represent the principal dimensions of the components. For instance, component 1 was labelled Leadership education and training challenges; component 2 was labelled Leadership succession challenge, and component 3 was themed political instability challenge. These names were derived based on their interrelated characteristics and combination of variables with high factor loadings.

Component 1: Leadership Education and Training

The first principal component (PC1) in Table 2 reported high factor loadings for the variables lack of skills (.789, 78%) and lack of training (.763, 76%). The numbers in brackets indicate the respective factor loadings, which assume the relative importance of the variable in the data set of the component. The component accounted for 25.3% of the variance explained as shown in figure 2. This finding supports the proposition of [13], that there should be structured programs that train managers. Also, Gomez (2018) stated that there is a lack of leadership program awareness within the construction industry.

Component 2: Leadership succession challenge

The second principal component (PC2) in Table 2 reported high factor loadings for the variables lack of opportunity (.720, 72%) and lack of self-confidence (.627, 62%). The numbers in brackets indicate the respective factor loadings, which assume the related importance of the variable in the data set of the component. Research by Jarad 2012 emphasizes that it is essential for the current leaders to give way and prepare future leaders. This finding further supports work by Glesson (2016), who stated that we currently have a succession developmental challenge within organisations.

Component 3: Political instability challenge

The third principal component (PC3) in Table 2 reported high factor loadings for the variables unstable political environment (.654, 65%) and racial divide in the workplace (.569, 56%). The numbers in brackets indicate the respective factor loadings, which appropriates the relative importance of the variable in the data set of the suitable appointed component. This finding supports the suggestion by Jarad (2012) and Ofori (2016), they asserted that willingness within organisations is of importance to developing leaders within a construction firm. Subsequently, it is vital for organisations to have a plan for all their employees to be able to overcome the leadership development challenge in the construction industry.

7 Conclusion Implications and Recommendations

As illustrated in the literature many studies show the need for leadership development, but there is less attention on how to grow existing managers within the construction industry. Therefore, there are not many studies in the area of developing leadership in the construction industry. Construction industry stakeholders need proper strategies to prepare future leaders who are capable of taking control and also influence. From the 12 LDC variables, the study reduced the variables to 3 challenging component areas forming the basis for lateral leadership development requirements in the context of the South African construction industry. Contribution of the paper to the body of knowledge is manifested in the use of the principal component analysis, which has rigorously provided understanding into the complex structure and the relationship between the various knowledge areas. The originality and value of the paper are embedded in the use of contextual-task conceptual knowledge to expound the three uncorrelated practical utility of leadership development challenges. Besides demonstrating the challenges affecting leadership development in the construction

industry, this study also has the effort to launch possible methods that can be implemented when designing a leadership development framework for the construction industry' organization, which is a need in developing current managers and employees. Implementing leadership education and training programmes for leadership development in the South African construction industry is recommended; thus, built environment education and training providers should provide leadership development methods which are flexible and integrative. Therefore, future research can develop and evaluate leadership frameworks, moreover assess the return on investment of the appraised leadership development programs and models.

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