

Challenges affecting leadership development in the construction industry

Murendeni Liphadzi¹, Clinton Aigbavboa², Temidayo Osunsanmi³ and Didibhuku Thwala⁴

^{1,2,3,4}Sustainable Construction Management and Leadership in the Built Environment, Faculty of Engineering and the Built Environment, University of Johannesburg, South Africa
mliphadzi@uj.ac.za

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

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

44

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

51 **2 Leadership Development in the construction industry.**

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

66

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

79

80 Also, Jarad [11] is of the view that construction organisations can develop leadership
81 and management skills by developing a culture of teaching, mentoring, self-study, and
82 frequent job changes. There is the need for a shift in the way project managers function
83 and lead projects, and it is essential for them to develop as leaders to successfully
84 operate in the increasingly complex working environment of the construction industry
85 [12]. In the fast changing construction industry, there is mounting pressure on project
86 managers to do more with fewer people and less resources. Under such circumstances,
87 the people-side of project management or leadership is vital. The next section
88 articulates the challenges affecting leadership development.

89 **3 Challenges affecting Leadership Development in the** 90 **construction industry.**

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

104
105 Cunningham and Rostron [13] cited the following challenges affecting leadership
106 development amongst organizations; balancing long-term and short-term business
107 requirements, lack of opportunity, lack of a formal structure, Inconsistent buy-in across
108 the organization, lack of support from senior leadership, lack of self-confidence by
109 managers, lack of accountability for the application of new skills and knowledge to the
110 job. Furthermore, Curphy [14] stated that there is a need to have context and relevance
111 when planning for leadership development. Similarly, Todd Macey, president of Vital
112 Learning, says the challenge to leadership development is the fact that organisations do
113 not focus on outcomes or the returns of the development strategy. According to Glesson
114 [15], there is a lack of awareness of the leadership development programs that are
115 accessible. Moreover, the process for being considered for a leadership role is often ad
116 hoc and nontransparent.

117
118 Leadership development practices are often fragmented and lack an overall strategy
119 that is embedded within the organisations (Weiss and Molinaro, 2005). Likewise,
120 Cunningham and Rostron [13] stated that inadequate internal resources to deliver
121 Leadership development programs was part of the challenge. In addition, the lack of

122 alignment between business strategy and the leadership development strategy of the
123 organisation. The essence of the challenge with leadership development is that
124 organisations invest heavily in leadership development, but do not necessarily see a real
125 or justifiable return on the investment. One of the main reasons for this is the
126 methodology employed for leadership development [11]. Curphy [14] further
127 simplified the challenges in Leadership Development as; the evaluation problem,
128 definition problem, the people problem and the content problem. In relation to the
129 evaluation problem, he stated that it is vital for the LD programs to be evaluated
130 consistently, whereby the outcomes focus on the skills, behaviours, competencies and
131 collaboration. Sadly, over the years, researchers have found that L&D programs for
132 leadership development are missing the mark. In the 2016 State of Leadership
133 Development report, 75 % of respondents said more significant innovation was needed
134 in learning techniques used in leadership development programs. Lastly, Glesson [15]
135 denoted that organisations no longer have a leadership challenge but a developmental
136 challenge.

137 **4 Methodology**

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

164 **5 Data Analysis**
 165 **Factor Analysis (Principal Component Analysis)**
 166

167 According to Field [16] , Badu [17] , factor analysis is useful for finding clusters of
 168 related variables and thus ideal for reducing a large number of variables into a more
 169 easily understood framework. Factor analysis addressed some pertinent issues relating
 170 to the appropriate sample size for undertaking and establishing the reliability of factors
 171 analysis [18]. Data were subjected to the Kaiser-Meyer-Olkin (KMO) measure of
 172 sampling adequacy which recorded a substantial value of 0.671. KMO and Bartlett's
 173 measure is used to measure sampling adequacy in the use of factor analysis [17]. The
 174 KMO statistic varies between 0 and 1 the value of zero indicates that the sum of partial
 175 correlations is large relative to the sum of correlations, indicating dispersion of pattern
 176 of the correlations and therefore factor analysis is likely to be inappropriate [19]. A
 177 value close to 1.00 indicates that patterns of correlation are relatively compact and so
 178 factor analysis should yield distinctive and reliable factors [17]. However, the literature
 179 suggests that the KMO value should be greater than 0.50 if the sample size is adequate
 180 [20] & [18] Subsequently, as presented in Table 1, the KMO measure of this study
 181 obtained a high value of 0.671 suggesting the adequacy of the sample size for the factor
 182 analysis. The Bartlett's test of Sphericity was also significant suggesting that the
 183 population was not an identity matrix.
 184

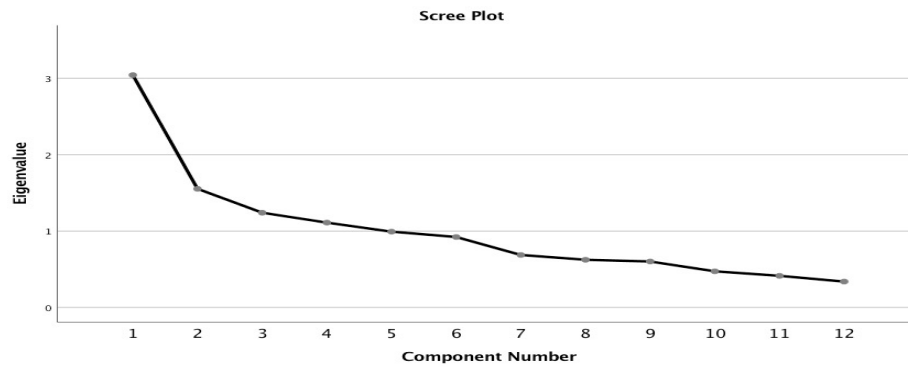
185 **Table 1.** KMO and Bartlett's Test

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

186
 187 After fulfilling all the necessary tests of the reliability of the survey instrument, sample
 188 size adequacy and population matrix, the data were subjected to factor analysis using
 189 principal component analysis (PCA), with varimax rotation. Earlier to principal
 190 component analysis, the communalities involved were first established. Communality
 191 illustrates the total amount an original variable shares with all other variables included
 192 in the analysis and is very useful in deciding which variables to extract finally. The
 193 average communality of the variables after extraction was above 0.60. The standard
 194 rule about communality values is that; extraction values (eigenvalues) of more than
 195 0.50 at the initial iteration indicates that the variable is significant; and should be
 196 included in the data for further analysis or otherwise removed [17]. The eigenvalue and
 197 factor loadings were set at common high values of 1.00 and 0.50 respectively [18].
 198 Utilizing the latent root criterion on the number of principal components to be extracted
 199 suggests that three components should be extracted as their respective eigenvalues are
 200 greater than one.
 201

202 As demonstrated in Table 2 and supported by the scree plot in Figure 1; Three (3)
 203 components with eigenvalues greater than 1.0 were extracted using the factor loading
 204 of 0.50 as the cut-off point. The total variance revealed by each component extracted is

205 as follows: The first principal component (component 1) accounted for 25.35 % of the
 206 total variance while the second principal (component 2) component, explained 12.94%
 207 % of the remaining variation not explained by the first component. Component 3
 208 accounted for 10.33%. The cumulative proportion of variance criterion, which says that
 209 the extracted components should collectively explain at least 45% of the variation,
 210 shows that the three extracted components cumulatively explained 48.63% of the
 211 variation in the data set. Scores are numbers that express the influence of an eigenvector
 212 on a specific sample.



213
214

Figure 1: Scree Plot

Component	Initial Eigenvalues			Extraction sum of square loadings			Rotation sum of squared loadings		
	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	16.703	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

215 **Table 2.** Rotated component matrix

216

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

224

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

233

234 **Table 3.** Rotated component matrix

	Component		
5.1	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			

235 **Extraction method: Principal component analysis**

236 **Rotation method: Varimax with Kaiser normalization**

237 **6 Discussions**

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

245

246

Component 1: Leadership Education and Training

247 The first principal component (PC1) in Table 2 reported high factor loadings for the
 248 variables lack of skills (.789, 78%) and lack of training (.763, 76%). The numbers in
 249 brackets indicate the respective factor loadings, which assume the relative importance
 250 of the variable in the data set of the component. The component accounted for 25.3%
 251 of the variance explained as shown in figure 2. This finding supports the proposition of
 252 [13], that there should be structured programs that train managers. Also, Gomez (2018)
 253 stated that there is a lack of leadership program awareness within the construction
 254 industry.

255

256

Component 2: Leadership succession challenge

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

264

265

Component 3: Political instability challenge

266 The third principal component (PC3) in Table 2 reported high factor loadings for the
 267 variables unstable political environment (.654, 65%) and racial divide in the workplace
 268 (.569, 56%). The numbers in brackets indicate the respective factor loadings, which
 269 appropriates the relative importance of the variable in the data set of the suitable
 270 appointed component. This finding supports the suggestion by Jarad (2012) and Ofori
 271 (2016), they asserted that willingness within organisations is of importance to
 272 developing leaders within a construction firm. Subsequently, it is vital for organisations
 273 to have a plan for all their employees to be able to overcome the leadership development
 274 challenge in the construction industry.

275

276 **6 Conclusion Implications and Recommendations**

277 As illustrated in the literature many studies show the need for leadership development,
 278 but there is less attention on how to grow existing managers within the construction
 279 industry. Therefore, there are not many studies in the area of developing leadership in
 280 the construction industry. Construction industry stakeholders need proper strategies to
 281 prepare future leaders who are capable of taking control and also influence. From the
 282 12 LDC variables, the study reduced the variables to 3 challenging component areas
 283 forming the basis for lateral leadership development requirements in the context of the
 284 South African construction industry. Contribution of the paper to the body of
 285 knowledge is manifested in the use of the principal component analysis, which has
 286 rigorously provided understanding into the complex structure and the relationship
 287 between the various knowledge areas. The originality and value of the paper are
 288 embedded in the use of contextual-task conceptual knowledge to expound the three
 289 uncorrelated practical utility of leadership development challenges. Besides
 290 demonstrating the challenges affecting leadership development in the construction
 291 industry, this study also has the effort to launch possible methods that can be
 292 implemented when designing a leadership development framework for the construction
 293 industry' organization, which is a need in developing current managers and employees.
 294 Implementing leadership education and training programmes for leadership
 295 development in the South African construction industry is recommended; thus, built
 296 environment education and training providers should provide leadership development
 297 methods which are flexible and integrative. Therefore, future research can develop and
 298 evaluate leadership frameworks, moreover assess the return on investment of the
 299 appraised leadership development programs and models.
 300

301 **References**

- 302 1. Emad, A. (2014). 'Leadership importance in construction productivity improvement'.
 303 Global Advanced Research Journal of Management and Business Studies (ISSN: 2315-
 304 5086) 3. (3.), pp. 114-125, March, 2014
- 305 2. Day, D. V., & Antonakis, J. (2012). 'Leadership: Past, present, and future'. In D. V. Day, &
 306 J. Antonakis (Eds.), *The nature of leadership* (pp. 3–25) (2nd ed.). Los Angeles, CA: Sage
- 307 3. Day, D. V., & Sin, H. P. (2014). 'Longitudinal tests of an integrative model of leader
 308 development: Charting and understanding developmental trajectories'. *The Leadership*
 309 *Quarterly*, 22(3), 545–560.
- 310 4. Mbande, C. (2010). 'Overcoming construction constraints through infrastructure deliver.
 311 Proceedings: The Association of Schools of Construction of Southern Africa (ASOCSA),
 312 Fifth Built Environment Conference. 18–20 July, Durban, South Africa
- 313 5. Liphadzi, M. (2014). 'An investigation of leadership styles of project managers and
 314 construction managers in the South African construction industry', University of
 315 Johannesburg.
- 316 6. John, A. (2004). 'The John Adair Handbook of Management and Leadership' (New ed.).
 317 Thorogood. ISBN 1-85418-204-8

- 318 7. Moore, J. (2006). 'Where do you start with leadership development', *Development and*
 319 *Learning in organizations* 18(5):3-9
- 320 8. Kotter, J.P (2001). 'Leading change: A conversation with John P Kotter', 25(1), *MCB UP*
- 321 9. Khoza, R. (2006). 'Let Africa Lead: African transformational leadership for 21st century
 322 business', First edition, Creda Communications
- 323 10. Bennis, W. and Nanus, B. (2007). 'Leaders: Strategies for Taking Charge' Collins business
- 324 11. Jarad, G.H. (2012). 'The construction manager leading characteristics for the success of
 325 construction projects in the Gaza Strip' Master's Thesis, The Islamic university of Gaza
- 326 12. Bass, M., & Avolio, J. (2004). 'Improving organizational effectiveness through
 327 transformational Leadership', California: Thousand Oaks
- 328 13. Emad, A. (2014). 'Leadership importance in construction productivity improvement'.
 329 *Global Advanced Research Journal of Management and Business Studies* (ISSN: 2315-5086
 330 [https://www.chieflearningofficer.com/2014/05/22/the-problem-with-leadership-](https://www.chieflearningofficer.com/2014/05/22/the-problem-with-leadership-development/)
 331 [development/](https://www.chieflearningofficer.com/2014/05/22/the-problem-with-leadership-development/)
- 332 14. Curphy, G. (2014). 'The problem with leadership development',
 333 [https://www.chieflearningofficer.com/2014/05/22/the-problem-with-leadership-](https://www.chieflearningofficer.com/2014/05/22/the-problem-with-leadership-development/)
 334 [development/](https://www.chieflearningofficer.com/2014/05/22/the-problem-with-leadership-development/)
- 335 15. Gleeson, B., (2016). '3 Challenges Organizations Face in Leadership Development',
 336 [https://www.inc.com/brent-gleeson/3-reasons-why-existing-leadership-development-](https://www.inc.com/brent-gleeson/3-reasons-why-existing-leadership-development-programs-dont-work.html)
 337 [programs-dont-work.html](https://www.inc.com/brent-gleeson/3-reasons-why-existing-leadership-development-programs-dont-work.html)
- 338
- 339 16. Field, A. (2005). 'Factor Analysis Using SPSS: Theory and Application',
 340 <http://www.sussex.ac.uk/users/andyf/factor.pdf>
- 341 17. Badu, E., Owusu-Manu, D. and Adinyira, E. (2009), 'Accepted, forthcoming Logical
 342 dimensions of procurement management curriculum (PMC) for project delivery in Ghana',
 343 *International Journal of Managing Projects in Business*, RMIT University, Australia,
 344 Emerald Group Publishing
- 345 18. Field, A. (2005). 'Discovering Statistics Using SPSS for Windows', London, Sage
 346 Publications
- 347 19. Gorsuch, R. L. (1983). 'Factor Analysis', Hillsdale, NJ: Lawrence Erlbaum
- 348 20. Child, D. (1990). 'The Essentials of Factor Analysis', 2nd ed, Cassel Educational Ltd,
 349 London
- 350 21. Yong, A.D. and Pearce, S. (2013). 'A beginner's Guide to factor analysis: focusing on
 351 exploratory factor analysis', University of Ottawa", *Tutorials in Quantitative Methods for*
 352 *Psychology*, Vol. 9 No. 2, pp. 79-94.
- 353 22. Tucker, L.R. and MacCallum, R.C. (1997). 'Exploratory factor analysis', available at:
 354 www.unc.edu/_rcm/book/ch7.pdf