

Sustainable Construction Project delivery: A Skills Availability Assessment in the Eastern Cape Province of South Africa

Athenkosi Sogaxa¹ and Stoffel Fourie²

^{1,2}Walter Sisulu University

Email: asogaxa@wsu.ac.za and sfourie@wsu.ac.za

Abstract:

The purpose of this paper is to evaluate factors affecting skills availability in the Eastern Cape Province for construction firms to achieve sustainable construction project implementation. Both the quantitative and qualitative research approaches were used in this study. A questionnaire was distributed to construction firms listed under general building Grade 5 to 9 in the Construction Industry Development Board (CIDB) register of Contractors within the Eastern Cape (EC) Province were surveyed. Validation of the questionnaire survey was conducted by data sourced through semi-structured interviews. The findings revealed factors affecting skills availability within construction firms are mainly two-fold: The first is retaining of skilled workers as most of employees are moving away from the industry and secondly the lack of adequate training in the sector. Findings from the qualitative study reveal that workers that possess constructions skills are moving away, some of construction workers have no interest in working in the construction industry and there is a lack of job availability. This study is limited to factors affecting skills availability on construction firms within the EC. The results obtained from this paper present factors affecting skills availability in the construction industry towards achieving sustainable construction project delivery. The practical implications are that the industry should be more diligent towards employee training and retain their skilled employees who are lost to another field which offer better remuneration. This was based factors affecting skills availability in the Eastern Cape Province for construction firms' to achieve sustainable construction project implementation and recommend areas of improvement concerning factors affecting skills availability on construction firms.

Keywords: Construction skills, skills development, skills shortage, sustainable construction and training.

1 Introduction

Variables of a construction project are labour cost, labour time utilized, material cost and plant cost. For this study, much attention is given to skilled labour availability that might affect construction project delivery (Stefan, 2011). In additions, Bilau, Ajagbe, Kigbu and Sholanke (2015) claimed that craftsmen in the construction industry plays a significant role towards the development and the existence of the construction firm as they are more involved in organisational operations. The construction industry offers mostly national and global employment opportunities (Oseghale, Abiola-Falemu & Oseghale, 2015). However, considering the high demand, the Construction Industry is experiencing with a skills shortage in traditional and new developments

(Mackenzie, Kilpatrick & Akintoye, 2000). Moreover, Zaki, Mohamed and Yusof (2012) pointed out that the skilled labour shortage is not peculiar to the Eastern Cape of South Africa, but it is a worldwide tendency given the overall high demand of limited skilled labourers. In addition, the attraction of the construction industry to the youth is problematic, as most of young people prefer other opportunities than the construction industry (Haupt & Harinarain, 2016). The result is that the government strategy to attract young people towards the industry to deal with the skills shortage issue is not effective (Zaki *et al.*, 2012). Additionally, Makhene and Thwala (2009) noted that the current generation of young people sees the industry as an unattractive industry and uninteresting for several reasons such as being dirty, a physical challenge, moving around when performing duty and most dangerous industry, leading most of the youth to pursue other careers.

There is high number of human resources available in the industry. However, the shortage of skilled tradesmen like plumbers, carpenters and electricians, whose skills requires effective training, persist (Windapo, 2016). Thus, there is a link between the skilled labour shortage and the nature of the building construction industry. Ademeso and Adekoya (2011) concluded that the construction industry in the Eastern Cape Province has continued to experience a skills shortage and the quality of work decreases because of inexperienced workers available in the industry. Mateus, Allen-Ile and Iwu (2014) pointed out that the construction industry unlike other sectors requires more knowledgeable workers, an integrated working environment, and effective technology. As a result, most construction workers are resisting the adoption of new skills (Mallo & Espinoza, 2015). These requirements impose a serious challenge between the industry and the current curriculum in both institutions and colleges regarding terms of the focus to mitigate the labour shortage in South Africa. Furthermore, Nzimande (2009) argued that the effect of education and training could not by itself resolve the challenges related to skills shortages in the construction industry. There is a serious need for skilled workers in the construction industry to enhance the development of the country's economy. Hence, the problem investigated is on the availability of skills in the Eastern Cape to enhance sustainable construction project delivery. This study is organised into six sections. The first section introduces sustainability and skills availability, followed by an overview regarding the concept of sustainable and skills availability in the construction industry. The methodological approach employed to achieve the aim of this study is discussed in section three. The subsequent sections present the results emanating from the study, followed by the conclusions and limitations of the study.

2 Literature review

2.1 Sustainable construction in the Eastern Cape Province

According to Du-Plessis (2007), sustainable construction is the ability to serve the present generation without compromising the ability of the future generation to meet their own needs. Moreover, Ebsen and Ramboll (2000) referred to sustainable construction as serving the current generation aspect of sustainable development that includes economic issues. However, over the years, sustainable development refers to macro-economic development (Corona, Shen, Reike, Carreon & Worrell, 2019). The current research within the built environment development indicates that sustainable construction aims to achieve project goals (Choguill, 2007). Hence, the purpose of this study is to investigate factors affecting skills availability in the construction industry.

2.2 Construction Skills issue in South Africa

Schultz (2003) suggested that over the past decade, South Africa has experienced high rate of decrease in the number of skilled individuals, trained in both public and private sector training. This is confirmed by a large decrease of registered contracts by the department of labour. Notwithstanding, the new generation is moving away and leaves the industry with a lack of professional skills and competent labours are moving to different fields or locations (Jide, Xincheng & Liangfa, 2017; Bosetti, Cattaneo & Verdolini, 2015; Bednarikova, Bavorova & Ponkina, 2016). This caused the South African government to aim at the implementation of skills training projects for newly employed workers in the environment are in place as a support, as it will improve production and provide a long-term investment on the skills shortage in South Africa. According to Bilau, Ajagbe, Kigbu and Sholanke (2015), construction skills is the ability to perform specific productive activity to a certain level of competence. Construction worker's skills are the most important aspect of sustainable construction practices (Zaki, Fikri, Mohamed, Yusof, 2012). Among other things, skilled construction workers perform the actual construction activities, by ensuring that the quality and standard of construction products are achieved. The handling and the use of materials, plant and machinery, preparing the site for construction purposes, manage the supply chain on the project site and ensure the completion and delivery of the project (Alzahrani and Emsely, 2013). In other words, the quality of a construction project is directly proportional to the skill and the effectiveness of training of construction labour. As a result, clients are always satisfied with a high standard of work, which leads to the client's continuous support (Windapo, 2016). On the other hand, skilled worker shortages, cause poor quality, delay the delivery of projects, cause client dissatisfaction, and damage the firm's image (Tshele and Agumba, 2014). Hence, contractors need to have skilled and qualified workers to increase production.

Furthermore, the productivity of construction worker's can be measured to determine the ratio of increase or decrease in comparative terms (Stefan, 2011). In addition, the project outputs of any construction activity rely on the amount of work done, quality of work done, and the value of work produced by construction workers. As part of the organisational support and skills improvement, Goldstein and Ford (2002) mentioned that there must be an assessment of the need for a specific skill, which must be an integrated decision of the company. Moreover, Goldstein and Ford (2002) and Green and McIntosh (2007) argued that the training conducted by the construction contractor needs an assessor who will be able to ensure that the training objectives are met and to validate the training expense. Organisational support consists of two fundamental factors: establishing the relationship between top management and operational management (Bello, Ahmad and Yusof, 2018). Thus, for the construction contractor to resolve the skills availability challenge there must be an integrated management system to assist and implement sustainable construction in the Eastern Cape.

2.3 Factors Affecting Construction Skills Availability

There is a relationship between skills availability and training programmes within the industry (e.g. Further Education and Training FET Collage) (CIDB, 2007). However, Modisaotsile (2012) argued that skills availability is determined by the educational system currently available in high institutions or training centres, and a significant decrease in the pass rate of matric/ grade 12 to meet the minimum requirements for higher education. Moreover, Mutereko and Wedekind (2015) showed poor matric results in both major subjects related to the construction industry

(Mathematics and Physical Science), thus leading to a shortage of certified trades, such as electrical and plumbing. Nonetheless, Silva, Warnakulasuriya and Arachchige (2018) hypothesized that the causal factor leading to skills shortage in South Africa is the inadequate number of trained personnel coming out from training institutions joining the construction industry with inadequate skills. AbdulAzeez, Etubi and Umar (2019) argued that inadequate skills management within the industry affects the skills shortage in construction industry. Johanson and Adams (2004) noted that informal training and education have been shared amongst young people, who then fail to progress in the academic environment to improve their skills and gain admission to vocational training institutions. Nevertheless, Mazzucato and Penna (2016) claimed that lack of funding on firms' side contributes to unavailability of skilled workers in the construction industry.

Additionally, an investigation performed by Barasa and Kaabwe (2001) found that there is more training on school leavers than all formal vocational training institutions combined, making it a significant contributor to skills development. Moreover, Akomah, Ahinaquah and Mustapha (2020) claimed that skills shortage is the result of low remuneration and motivation for skilled workers, such that young people are not interested in vocational training. This indicates that there are many persons with some skills within the industry, but the skills are not meeting the minimum requirements for employment. CIDB (2011) suggested that a guide to the skills development is to improve workers access to job opportunities that never existed in the past and this benefits contractors' in the foreseeable future in terms of project quality improvement. Bednarikova, Bavorova and Ponkina (2016) and Hauptfleisch (2006) showed that most government projects are used to transfer skills that encourage and improve the skills of those who were historically segregated before 1994. Moreover, Van Heerden, Mashatole and Burger (2014) agreed that government has numerous initiative programmes, which seek to encourage the growth and development of construction quality and improve sustainable project implementation. Thus, the above literature makes a strong case for the development of workers to have the specific skills required by the construction industry. However, apart from the future skilled workers' shortages, the problem of fast change needed to adopt green construction loom large and remain unsolved (Hampson & Brandon, 2004).

3 Methodology

This study adopted a combined research methodology approach of quantitative and qualitative methods to respond to the research questions and achieve the research objectives, including overcoming the challenges of validity and bias of the research study. The mixed method approach constructs a broader view of the research, as the quantitative approach present the gathered information in a numeric manner (Baxter, Hughe & Tight, 2006). The quantitative data were obtained with the aid of a structured questionnaire survey from contractors (directors, project managers, quantity surveyors, engineers, construction managers and site agents), who were purposively selected. This approach assists the research in selecting the relevant participants in the study and improving the research study's quality. O'leary (2010) describes sampling as the process of breaking a large group of respondents into sections with the purpose of deriving results concerning the larger group. The population for this study was purposively selected comprising construction firms who previously completed a construction project or currently busy with a construction project. These construction firms were listed under CIDB general building Grade 5 to 9 in the Register of Contractors in East London, a metropole of the Eastern Cape Province. Two participants were purposively selected from twenty construction firms. This equates 40 participants

in total. Soft copies of the survey questionnaires were administered to participants through emails, while hard copies were administered to the firm's management team available on construction sites. It is noteworthy that this study focused on the quality of the results rather than the quantity of the population. A five point Likert scale questionnaire survey was employed in data gathering; while 5 the highest rating is in relation to how skill shortages is affected. Fellows and Liu (2008:182) suggested that after completing the rankings of the variables, these ratings indicate the degree of being affected and ranking displays the hierarchy. Seventeen (17) questionnaires were returned and completed correctly, representing 43% response rate.

Shortly after the main questionnaire survey was completed, two semi-structured interviews (qualitative method) were administered to validate the quantitative results. The results of the quantitative data were analysed descriptively using a Statistical Package for the Social Sciences (SPSS) version 25 software. These results were summarised and organized using tables. On the other hand, the data collected using semi-structured interviews, was analysed using content analysis. In addition, Flick (2011) explained that content analysis enables the researcher to omit any irrelevant information and terms and summarise accounts.

4 Analysis of Results

4.1 Summary of the Profile of respondents

In terms of age group distribution of the 17 participants, it was found that the age group of 41 to 50 (64.7%0 dominated. Forty-seven point zero seven (47.07) percentage of respondents have relevant experience ranging between 1 to 5 years. Concerning educational qualification, the largest number of the participants 52.94% hold Bachelor's degree qualifications. Regarding the role of the respondents in the firm, about 41.17% of the respondents were construction managers.

Table 1. Profile of participants

	Category	No. Participants	Percentage %
Age group in years	18 – 25	1	5.88
	26 – 40	3	17.64
	41 – 50	11	64.71
	50 – 60	2	11.76
Total		17	100
Experience of the participants in years	0 – 5	3	17.64
	6 – 10	4	23.53
	11 – 20	8	47.07
	20 – Above	2	11.76
Total		17	100
Educational qualification	Matric	5	29.41
	Diploma	2	11.76
	Degree	9	52.94
	Post Graduate	1	5.88
Total		17	100
Role of the participants	Site agent	3	17.64
	Construction manager	7	41.17
	Quantity Surveyor	0	0
	Director	5	29.41
	Others	2	11.76
Total		17	100

4.2 Factors affecting construction skills availability

Table 2 presents the statements pertaining to factors affecting construction skills availability in the Eastern Cape. The respondents indicated to what extent they agreed with the given statements using a 4-point Likert scale where 1- Strongly disagree, 2- Disagree, 3- Agree, 4- Strongly agree. First, findings signified that most workers, after obtaining specific skills, change their employers to seek a better income and the lack of funding to invest in workers. Both had the same mean score of 3.53. This is followed by the industry's lack of attractiveness to young people, with a mean score of 3.47. Next, most construction workers move to other provinces to seek better lives together with workers who are not motivated to work in the Eastern Cape Province, with a mean score of 3.41, which is the cause of the unavailability of skills in the Eastern Cape. Others are workers who possess skills are not meeting the minimum requirements of employment (3.55), most job adverts requires specific experience and education in the construction industry (3.29), and Labourers are not allocated based on their skills (3.24). The average mean score is (3.43) indicating that all these factors have a significant contribution in skills availability in the Eastern Cape Province.

Table 2. Factors affecting construction skills availability

Factors affecting skills availability	Response						
	No	1	2	3	4	Mean	Rank
Most workers after obtaining specific skill turn to change their employers to seek better income.	17	0	0	8	9	3.53	1
Skills shortage affect contractors planning and result in inadequate resource planning.	17	0	1	6	10	3.53	1
Lack of funding to invest in workers training.	17	0	1	6	10	3.53	1
The industry is affected by a lack of attractiveness to young people.	17	0	0	9	8	3.47	2
Workers are not motivated to work in the Eastern Cape Province.	17	0	1	8	8	3.41	3
Workers who possess the skills are not meeting the minimum requirements of employment.	17	0	2	7	8	3.35	4
Most job adverts require specific experience and education in the construction industry.	17	0	2	8	7	3.29	5
Labourers are not allocated based on their skills.	17	0	1	11	5	3.24	6
Average	17					3.43	

4.3 Qualitative interviews

Table 3 present the profile of the respondents who took part in interviews. Table 3 indicates that the respondents were construction manager and site agent respectively. Both respondents were from contractor's listed on Grade 6 cidb Register of Contractors within the Eastern Cape Province.

It is noteworthy that respondent A was from a company that is doing general building contracts, whilst, respondent B was from a firm doing alterations and renovations.

Table 3. Profile of the respondents

Interview participants'	Position	Company Grade (cidb)	Type of Service
Respondent A	Construction manager	6	General building
Respondent B	Site agent	6	Alterations and renovations

4.4 Qualitative results on factors affecting skills availability

Respondent A revealed that in the construction industry around 30% of construction firms in the province employs skilled workers. However, due to lack of project, firms' are forced to retrench these employees. *Respondent A* further stated that most of workers employed in construction industry are not passionate to succeed in the construction industry and they use their employment as the source of income. *Respondent B* argued that most of skilled workers are willing to learn and pay attention in details. Similarly, *Respondent B* noted that construction contractors allocate workers based on their skills and expert. Lastly, *Respondent B* revealed that lack of project availability affects worker's willingness to lean and lead to skills shortage in the industry.

5 Discussion of Results

The quantitative results obtained indicate that from a ranking perspective, the factors affecting construction skills availability in the Eastern Cape Province include the fact that: Most workers, after obtaining a specific skill, change their employers to seek a better income. This statement aligns with the opinion of Bosetti, Cattaneo and Verdolini (2015), who reveal that the diversity imposed by the change in the building fraternity pushes employees to seek employment in other industries to earn a better income and work in a conducive environment.

The lack of fund to invest in training workers is recognise as one of the most significant factors affecting skills availability in the Eastern Cape. In support, Mazzucato and Penna (2016) argued that lack of project funding for skills development, particularly in privately owned construction projects. The second most significant factor affecting construction skills availability in the industry is the lack of attractiveness of construction to young people. Haupt and Harinarain (2016) who postulated that although the construction industry is important for economic development, the construction industry has been affected by a poor image for a long time, support this finding. Lastly, workers are not motivated to work in the Eastern Cape Province. This finding aligns with that of previous research by Bednarikova, Bavorova and Ponkina (2016), which mentioned employee job satisfaction, health care and personal expectations, as driver's employee's attitude, which improves productivity at the project level. Concerning the qualitative findings, Mallo and Espinoza (2015) showed that construction employees are willing to change to and learn new technologies that are related to the industry, to improve production. The findings presented in Table 2 aligns with the literature, that workers who possess construction skills are

willing to learn new skills. Similarly, the findings revealed that firm's allocation is effected on a basis to benefit employees who require specific skills. This finding corroborate the finding of Green and McIntosh (2007), who declare that most skilled workers are allocated with senior job vacancies and assisted by unskilled workers in order to fulfil the labour shortage on a job site. Finally, it is worth noting that the quantitative findings were consistent with the qualitative findings.

6 Conclusion and recommendations

A review of literature on availability of skilled workers in the Eastern Cape Province was performed and an assessment to enhance sustainable construction project delivery was carried out. The mixed-method research approach was adopted to evaluate factors affecting skills availability in the Eastern Cape Province. Regarding the quantitative analysis, the study found from the ranking perspective that the most important factors affecting skills availability in the Eastern Cape include: Most workers, after obtaining a specific skill change their employers to seek better income together with lack of funding to invest in worker's training, and the lack of attractiveness to young people. Concerning the qualitative findings, the results align with the quantitative analysis, as the respondents agreed on the factors affecting skills availability in the Province. This includes workers who possess construction skills and are willing to learn. In addition, the respondents revealed that firms allocate employees to benefit those who require certain skills. The findings indicate that the lack of attractiveness of the construction industry is a major concern within the industry. It was found that the training of employees during project delivery improve production and the firm's sustainability. Regarding the skills availability in the Eastern Cape Province, construction firms should ensure that they remunerate employees reasonably to retain their service. In addition, there is a need to train employees on new technologies to improve production and change the image of the industry through the effective adoption of technology.

7 Referencing

- AbdulAzeez, A.D., Etubi, U. & Umar, B. (2019), An Assessment of Multi-skilling in Addressing Skills Shortage in Nigerian Construction Firms. *African Journal of Built Environment Research*, 3(1), pp. 1-12.
- Ademeso, A.O. & Adekoya, A.J. (2016), Relationship between Petrography and Uniaxial Compressive Strength of Some Crystalline Basement Complex Rocks of some Areas in South-western Nigeria. *British Journal of Science*, 2(1), pp. 21-34.
- Akomah, BB., Ahinaquah, L.K. & Mustapha, Z. (2020), Skilled labour Shortage in the Building Construction Industry within the central region. *Baltic Journal of Real Estate Economics and Construction Management*, 8, 83-92.
- Alzahrani, J.I., Emsley, M.W. (2013), The impact of contractors' attributes on construction project success: A post construction evaluation. *International Journal of Project Management*, 31(2), pp 313-322.
- Barasa, F.S. & Kaabwe, E.S.M. (2001), Fallacies in Policy and Strategies of Skills Training for the Informal Sector: Evidence from the Jua Kali sector in Kenya. *Journal of Education and Work*, 14(3), pp. 329-353.
- Baxter, L., Hughe, C. & Tight, M. (2006), How to Research. New York: McGraw-Hill.

- Bednarikova, Z., Bavorova, M. & Ponkina, E.V. 2016. Migration Motivation of Agriculturally Educated Rural Youth: The Case of Russian Siberia. *Journal of Rural Studies*, 45, pp. 99-111.
- Bello, S.M., Ahmad, A.C. & Yusof, N.Z.M. (2018), Internal Audit Quality Dimensions and Organizational Performance in Nigerian Federal Universities: The Role of top Management Support. *Journal of Business and Retail Management Research (JBRMR)*, 13(1), pp. 156-170.
- Bilau, A.A., Ajagbe, M.A., Kigbu, H.H. & Sholanke, A.B. (2015), Review of Shortage of Skilled Craftsmen in Small and Medium Construction Firms in Nigeria. *Journal of Environment and Earth Science*, 5(15), pp. 98-110.
- Bosetti, V., Cattaneo, C. & Verdolini, E. (2015), Migration of Skilled Workers and Innovation: A European Perspective. *Journal of International Economics*, 9(2), pp. 311-322.
- CIDB, (2007), Skills for Infrastructure Delivery in South Africa: The Challenge of Restoring the Skills Pipeline, Pretoria: Construction Industry Development Board.
- Cogill, C. (2007), The Search for Policies to Support Sustainable Housing. *Habitat International*, 31, pp. 143-149.
- Construction Industry Development Board (CIDB) (2011), Baseline Study of Provincial Contractor Development Programmes, Review of the Contractor Development: Towards an NCDP Monitoring and Evaluation System.
- Corona, B., Shen, L., Reike, D., Carreon, J.R. & Worrell, E. (2019), Towards Sustainable development through the circular economy – A Review and Assessment on Current Circularity Metrics. *Resources, Conservation & Recycling*, 151, pp. 1-15.
- Du-Plessis, M. (2000), The Role of Knowledge Management in Innovation. *Journal of Knowledge Management*, 11(4), pp. 20-29.
- Ebsen, C. & Rambøll B. (2000), Housing Projects; *Danish International Human Settlement Proceedings*, Strategies for a Sustainable Built Environment, Pretoria, 23-25 August 2000.
- Fellows, R. & Liu, A. (2008), Research Methods for Construction, 3rd ed, Chichester, Wiley-Blackwell.
- Flick, U. (2011), Introducing Research Methodology – *A Beginner's Guide to Doing a Research Project*. Sage publications, pp. 1-188.
- Goldstein, I.L. & Ford, J.K. (2002), Training in Organisations, 4th ed. Belmont, CA: Wadsworth.
- Green, F. & McIntosh, S. (2007), Is there a Genuine Under-utilisation of Skills Amongst the Over-qualified? *Journal of Applied Economics*. 39(4), pp. 427-439.
- Haupt, T. & Harinarain, N. (2016), The Image of the Construction Industry and its Employment Attractiveness. *Acta Structilia*, 23(2), pp. 79-108.
- Hauptfleisch, T. (2006), Eventifying Identity: Festivals in South Africa and the Search for Cultural Identity.
- Heerden, H., Mashatole, S. & Burger, M. (2014), *Constraints faced by Small Contractors in the Gauteng Province of South Africa Conference of Informatics and Management Sciences*, viewed March 18 2021.

- Jide, S., Xincheng, W. & Liangfa, S. (2017), Chinese construction Workers' Behaviour towards Attending Vocational Skills Training: Evolutionary Game Theory with Government Participation. *Journal of difference equations and applications*, 23 (1), 468-485.
- Mackenzie, S., Kilpatrick, A.R., & Akintoye, A. (2000), UK Construction skills Shortage Response Strategies and an Analysis of Industry Perceptions. *Construction Management and Economics*, 18(7), pp. 853–862.
- Makhene, D., & Thwala, W.D. (2009), *Skilled Labour Shortages in Construction Contractors: A literature review*. Johannesburg: University of Johannesburg.
- Mallo, M.F.L. & Espinoza, O. (2015), Awareness, Perceptions and Willingness to adopt Cross-Laminated Timber by the Architecture Community in the United States. *Journal of Cleaner Production*, 94, pp. 198-210.
- Mateus, A.D., Allen-Ile, C. & Iwu, C.G. (2014), Skills Shortage in South Africa: Interrogating the Repertoire of Discussion. *Mediterranean Journal of Social Sciences*, Vol. 5 (6), pp. 63-73.
- Mazzucato, M. & Penna, C.C.R. (2016), Beyond Market Failures: The Market Creating and Shaping Roles of State Investment Banks. *Journal of Economic Policy Reform*, 19(4), pp. 305-326.
- Modisaotsile, B.R. (2012), The Failing Standard of Basic Education in South Africa. *Africa Institute of South Africa*. Policy Brief No. 72. March.
- Morgan, J. & Talbot, R. (2001), Sustainable Social Housing for No Extra Cost?, *London and New York, Spon Press*, pp. 319-328.
- Mutereko, S. & Wedekind, V. (2015), Work-integrated Learning for Engineering Qualifications: A Spanner in the Works?. *Journal of Education and Work*, 29(8), pp. 902-921.
- O'leary, Z. (2010), *The Essential Guide to Doing Your Research Project*. Sage Publications, pp. 92-240.
- Oseghale, B.O., Abiola-Falemu, J.O. & Oseghale, G.E. (2015), An Evaluation of Skilled Labour Shortage in Selected Construction Firms in Edo State, Nigeria. *American Journal of Engineering Research (AJER)*, 4 (1), pp. 156-167.
- Schultz, P. (2003), Pseudo Market Timing and the Long-Run Underperformance of IPOs. *Journal of the American Finance Association*, 58(2), pp. 483-517.
- Silva, G.A.S.K., Warnakulasuriya, B.N.F. & Arachchige, B.J.H. (2018), A Review of the Skill Shortage Challenge in Construction Industry in Sri Lanka. *International Journal of Economics, Business and Management Research*, 2(1), pp. 75-89.
- There, L. & Agumba, A.J. (2016), Investigating the Causes of Skills Shortage in South African construction Industry: *A case of Artisans*, pp. 102-110.
- Windapo, A.O. (2016), Skilled Labour Supply in the South African Construction Industry: The Nexus between Certification, Quality of Work Output and Shortages. *South African Journal of Human Resource Management*, 14(1), pp. 1-8.
- Zaki, S.A., Mohamed, S.F. & Yusof, Z.M. (2012), Construction Skilled Labour Shortage: The Challenges in Malaysian Construction Sector. *International Journal of Sustainable Development*, 4(5), pp. 99-108.