

Supply Of Skilled Workers Towards Performance Of Construction Organisations In Nigeria

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Abstract: Skilled workers are highly instrumental in the performance of any construction organisation. Yet, skilled workers in Nigeria is dwindling as it overlooks the relative shortage of particularly skilled trades required by the construction organisations. Hence, the purpose of this study is to identify the skilled workers towards performance of construction organisations. The objectives of this study include to identify the skilled workers required by the construction organisations and to evaluate the degree of agreement between construction organisations in ranking the skilled workers. Data for this study was collected through a self-administered questionnaire on a stratified sample of construction organisations. 290 validly questionnaires were returned and were analysed using Relative Importance Index (RII) on a scale range from 1-5 for ranking comparison between construction organisations. Kendall's coefficient of concordance was used to evaluate the degree of agreement between construction organisations related to the ranking of skilled workers. The results of RII indicates that asphalt/tar sprayers were ranked topmost by engineers, while, glaziers were ranked first by quantity surveyors, and equipment operators were ranked first by builders and architects. Accordingly, the results revealed that equipment operators, glaziers, insulating specialist, asphalt/tar sprayers, fabricators, scaffolding specialist, suspended ceiling specialist, plumbers, electricians and roofers are the ten skilled trades required by the construction organisations. The results of Kendall's coefficient of concordance revealed that a high agreement between construction organisations occurred in the ranking of the skilled workers. The results revealed that the skilled trades that were ranked topmost are highly technical trades which are significant for the performance of construction organisations. Thus, efforts should be geared towards improving the supply of these skilled workers.

Keywords: Construction organisations, Organisational performance, Shortage of skilled workers, Skilled trades, Supply of skilled workers

1 INTRODUCTION

The performance of construction organisations have been adjoined to be one of the drivers of social and economic development of any nation [32]. Construction organisations, thus, has a significant influence on every other sector, which makes it a substantial frontier for socio-economic development [7], [27]. However, the influence of the construction organisations to national economic growth requires quality and availability of skilled workers for effective and efficient project delivery [16], [33]. Though, there is a growing shortage of skilled workers in the Nigerian construction organisations [11], [28], thus resulting in low performance of construction organisations. Inferentially, it would be safe to argue that the construction organisation's persistent skills shortages are in part, a failure of its human resource planning. This is because the skilled workers are highly fragmented, and the implication of which there is little or no speculative knowledge of human resource planning needed to achieve organisational performance [16]. Human resource planning provides insight into the type of skilled workers available in the labour market [10]. [5], emphasized that in the labour market, skills shortage occur when the demand for workers for a particular work is greater than supply of qualified and available workers, and if the supply is greater than demand then there is surplus. [14], affirmed that a shortage may be apparent only in a particular category of trades and it does not have to be across the whole skills. [39], affirmed that the construction labour market in developing countries requires various skilled workers to match the level of expected infrastructural development. Despite these concern, skilled workers in Nigeria is dwindling as it overlooks the relative shortage of particularly skilled trades required by construction

organisations. Hence, this study aims to identify the skilled workers towards the performance of construction organisations. The objectives of the study include to identify the skilled workers required by the construction organisations and to evaluate the degree of agreement between construction organisations in ranking the skilled workers.

2 SKILLED TRADES IN NIGERIAN CONSTRUCTION ORGANISATIONS

The quality and availability of skilled workers are considered an essential driver towards the effectiveness and efficiency of the construction organisations [17]. [5], observed that skilled workers had become the only sources of rapid growth and long term competitive advantage in the construction organisations to deliver products and services that can meet with client's needs and satisfaction. This is because skilled workers are directly involved in the technical aspects and speedy realisation of construction projects. [6], [38]. [17], affirmed that the National Directorate of Employment (NDE) in Nigeria enumerated the followings as recognised skilled workers in the construction industry, namely; masons, steel fixers, electricians, carpenters, plumbers and welders. [28], asserted that conventional skilled workers include electricians, plumbers, painters, carpenters, bricklayers, bar benders, tile fixers, plant operators, welders, mechanics, and steel fixers. [4], stressed that skilled workers vary from mason, carpenter, tile worker, steelworker, painter, electrician and plumber. The study of [22] viewed that skilled workers in the construction organisations include; iron bender, carpenter, bricklayer, painter, electrician, welding worker, plumber and tiler. However, [1] listed categories of skilled workers which include; carpenter, bricklayer, painter, iron bender and plumber. [41], stated that frequent used skilled workers in the construction organisations include; carpenters, bricklayers, bar bender, plumbers and painters as their services are required most in the construction projects. [5], identified mason, painter, steel fitter and plasterer as the major categories of skilled workers in small construction projects. In large and complex construction projects, [6] identified masons/bricklayers, carpenters, roofers, equipment operators, glaziers, painters, plasterers, iron benders, fabricators, scaffolding specialist, tile fixers, suspended ceiling specialist, plumbers, pipefitters/layers, electricians, air conditioners, terrazzo workers, asphalt/tar sprayers, insulation workers, and refrigeration installers as the major categories of skilled workers. However, in the last decade, increasing demand for skilled workers in most developing countries could be observed [38]. These demands have been associated with the development of increasingly integrated

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labour markets for an improved performance and productivity, and the appearance of skill-biased technological change which is often ascribed to the acceleration of technological developments [36]. In Nigeria, the key drivers of demand of skilled workers in the short-term (3-5 years) are the expected projects for the government infrastructural development programmes and extraordinary demand for buildings from corner to corner of all sectors of the economy [37]. The former, which is the planned government spending (planned expenditure of \$4.46 billion from 2015-2018) is calculated to be the most significant investment in the Nigerian construction sector, obscuring even the budget for other sectors programmes [25]. The latter (extraordinary demand for buildings from corner to corner of all sectors of the economy) is expected to bring about an estimated \$2.35 billion building projects [12]. Though, various reports have indicated the existence of shortages of skilled workers in the Nigerian construction organisations [11], [28]. [9], [22] question the skills taught in the various training programmes and posited that these skills do not make a significant contribution to the specialised skills required by the construction industry. They emphasized that specialised vocational programmes must prepare workers for complex construction projects which are essential for socio-economic development in the country [1]. Apparently, taking into account the relative shortage of skilled trades required by construction organisations has been an under-utilised practice, especially in Nigeria. Hence, it is this gap of identifying these skilled workers that is the primary stimulus for this research.

Table 1:

Categories of skilled workers in the Nigerian construction organizations

Category	Trades	Source
Structural workers	Masons/bricklayers, joiners/carpenters, equipment operators, iron benders, fabricators, welders, roofers, scaffolding specialist	[1], [4], [5]; [6], [17], [22], [28], [41]
Finishing workers	Painters, plasterers, glaziers, suspended ceiling specialist, tile fixers, terrazzo workers, asphalt/tar sprayers	
Service workers	Plumbers, pipe fitters/layers, electricians, air conditioners, refrigeration installers, insulating specialist	

Source: As indicated

3.2 Sample structures

The population of this research were targeted on construction organisations as recognized by Bureau of Public Procurement, BPP, Act, 2007 as amended, 2018 in carrying out construction activities in Nigeria. According to council for the regulation of engineering in Nigeria (COREN), quantity surveyors registration board of Nigeria (QSRBN), council of registered builders of Nigeria (CORBN) and architects

3 RESEARCH METHODOLOGY

3.1 Research Strategy

In extension from the above review works in uncovering the type of skilled trades in the construction organisations. The comprehensive literature review work has identified a total of twenty-one (21) skilled trades in the labour market as presented in Table 1, which was classified into structural, finishing and services workers. Thus, this provides bases to determine the skilled trades required by the construction organisations. A pilot study was first carried out on a small respondent to ensure clarity and directness of the questions used in the questionnaire and also to determine the ease of completing the survey. Thirty construction professionals having a strong background of construction business participated in the pilot study. These professional includes; engineers, quantity surveyors, builders and architects. The respondents suggested a few changes to the questionnaire regarding the wordings of the questions. The questionnaire was then modified based on the professionals' feedback, before it was finally used at the data collection stage. The questionnaire consists of two sections. Section A consist of respondents personal particulars such as; membership of professional bodies, years of experience, academic qualification, numbers of projects executed and regular client type. In section B, each respondent was asked to rate the each of skilled trades required by the construction organisations on a five-point Likert scale ranging from 1 to 5, where 1 represents "None" and 5 represent "Very high".

registration council of Nigeria (ARCON), as at January, 2019 there were a total number of 1,689 registered construction engineers organisations, 331 registered quantity surveyors organisations, 1,578 registered builders organisations and 1,148 registered architects organisations, and which 21.0%, 23.6%, 20.7% and 21.5% respectively are concentrated in Abuja. Consequently, a list of the organisations were compiled from each members' directory in the study area, which includes their contact details. This made the task of identifying the organisations achievable. The generated list contained 355 construction engineering organizations, 78 quantity surveying organisations, 327 building organisations and 247 architectural organisations in Abuja. These subsequently became the sampling frame from which the research's sample size was drawn. The sample size was drawn using equation of [21] cited in [15] for determination of sample size for each categories of respondents. The reason for using [21] equation is because the population is discrete since it has a finite range and it is known. Therefore, for 355, 78, 327, 247 engineers, quantity surveyors, builders and architects organisations respectively, 184, 65, 177, 150 questionnaires was distributed respectively in order to achieve 95% confidence level. Hence, the questionnaire were delivered to the respondents in person to improve response rate and quality of the responses. Table 2 shows the summary of the sample responses of the questionnaire survey. From Table 2, the response rates were 95(51.6%), 36(55.4%), 85(48.02%) and 74(49.3%) for engineers, quantity surveyors, builders and architects respectively. This was considered adequate for analysis based on assertion by [30] that the result of a survey could be considered as biased and of little importance if the return rate was lower than 30% to 40%.

Table 2.

Sample responses of the questionnaire survey

Construction organizations	Number of questionnaire		Percentage returned
	Number administered	Number valid for analysis	
1. engineers	184	95	51.6%
2. Quantity surveyors	65	36	55.4%
3. Builders	177	85	48.02%
4. Architects	150	74	49.3%
Total	576	290	

Source: Fieldwork, 2019

4 Data Analysis and Discussion

The data was analyzed using the following methods; Relative Importance Index (RII) ranking construction organizations Ranking was employed using RII which was developed to evaluate the relative importance index of multivariate. The performance of each parameter was evaluated based on the importance weighting and the proposed efficiency of each variable. From the responses on each of the skilled trades required by the construction organisations, RII was calculated using the following formula as expressed mathematically by [20];

$$RII = \frac{5n_1 + 4n_2 + 3n_3 + 2n_4 + n_5}{5(n_1 + n_2 + n_3 + n_4 + n_5)}$$

Where n_1 represents the number of respondents who answered 'very high', n_2 represents the number of respondents who answered 'high', n_3 represents the number of respondents who answered 'moderate', n_4 represents the number of respondents who answered 'low', n_5 represents the number of respondents who answered 'none'. Table 3, presents the ranking of each of the skilled trades based on the RII. Asphalt/tar sprayers was ranked as first by the engineers, fourth by quantity surveyors, third by builders and fourth by architects. This

revealed the vast road construction projects in Nigeria, and confirms the experiences of engineers which are drawn from the poor road finishing. Equipment operators was ranked first by builders and architects, and was ranked second by engineers and quantity surveyors. Insulating specialist was ranked second by builders, third by architects and quantity surveyors, and fourth by engineers. Glaziers was ranked first by quantity surveyors, second by architects, and third by engineers and builders. Fabricators was ranked fifth by engineers and quantity surveyors, and sixth by builders and architects. Suspended ceiling specialist was ranked fifth by builders, sixth by engineers and architects, and seventh by quantity surveyors. Scaffolding specialist was ranked fifth by quantity surveyors and architects, and seventh by engineers and builders. Plumbers was ranked eighth by engineers, builders and architects, and tenth by quantity surveyors. Electricians was ranked eighth by quantity surveyors, ninth by engineers, and tenth by builders and architects. Roofers was ranked ninth by builders and architects, and tenth by engineers and quantity surveyors. Consequently, the construction organisations' rankings of each skilled trades were evaluated as a percentage.

Table 3:
RII of construction organisations' responses

Construction organisations	ENGR			Q/S			BUILDER			ARCH		
	S	RII	R	S	RII	R	S	RII	R	S	RII	R
A. Structural workers												
1. Masons/bricklayers	301	0.634	20	109	0.606	21	258	0.607	21	223	0.603	21
2. Joiners/carpenters	307	0.646	19	110	0.611	20	262	0.617	19	229	0.619	19
3. Equipment operators	398	0.838	2	152	0.844	2	359	0.845	1	315	0.851	1
4. Iron benders	313	0.659	16	118	0.656	17	281	0.661	16	239	0.646	17
5. Fabricators	387	0.815	5	147	0.817	5	337	0.793	6	288	0.778	6
6. Welders	327	0.688	15	128	0.711	13	283	0.666	14	252	0.681	15
7. Roofers	358	0.754	10	132	0.733	10	319	0.751	9	274	0.741	9
8. Scaffolding specialist	379	0.798	6	146	0.811	7	341	0.802	5	288	0.778	6
B. Finishing workers												
9. Painters	299	0.630	21	112	0.622	19	260	0.612	20	229	0.619	19
10. Plasterers	312	0.657	17	114	0.633	18	265	0.624	18	230	0.622	18
11. Glaziers	397	0.836	3	153	0.850	1	355	0.835	3	313	0.846	2
12. Suspended ceiling specialist	371	0.781	7	147	0.817	5	331	0.779	7	292	0.789	5
13. Tile fixers	312	0.657	17	119	0.661	16	277	0.652	17	245	0.662	16
14. Terrazzo workers	352	0.741	12	134	0.744	9	313	0.737	11	268	0.724	12
15. Asphalt/tar sprayers	407	0.857	1	148	0.822	4	355	0.835	3	307	0.830	4
C. Service workers												
16. Plumbers	369	0.777	8	132	0.733	10	323	0.760	8	278	0.751	8
17. Pipe fitters/layers	355	0.747	11	131	0.728	12	310	0.729	12	271	0.732	10
18. Electricians	363	0.764	9	135	0.750	8	318	0.748	10	271	0.732	10
19. Air conditioners	332	0.699	14	125	0.694	15	284	0.668	13	256	0.692	14
20. Refrigeration installers	335	0.705	13	127	0.706	14	282	0.664	15	261	0.705	13
21. Insulating specialist	396	0.834	4	149	0.828	3	358	0.842	2	308	0.832	3

*S: Sum of responses; RII: Relative Importance Index; R: Ranking Drawing on the calculation of RII, the results can be expressed as a percentage [29]. Rank Agreement Factor (RAF) and Percentage Rank Agreement Factor (PRAF) was used to quantitatively measure the agreement in the importance ranking among the engineers, quantity surveyors, builders and architects. This is in line with the suggestion by [13], and expressed mathematically as follows;

$$RAF = \frac{\sum EQBA}{N}$$

$$PRAF = \frac{RAF_{max} - RAF_i}{RAF_{max}} \times 100\%$$

Where RAF_{max} = maximum RAF, N = total number of skill trades, and $\sum EQBA$ = sum of the order of ranking by engineers, quantity surveyors, builders and architects. The RAF can be >1 , with a higher factor implying greater disagreement while a RAF zero implies perfect agreement [13]. The results of RAF is shown in the seventh column of

Table 4. For 21 skilled trades in the Nigerian construction organisations, RAF_{max} is 3.95. The RAF of equipment operators (0.29), glaziers (0.43), insulating specialist (0.57) and asphalt/tar sprayers (0.57) are quite above zero, which implies perfect agreement. While, the RAF of fabricators (1.05), roofers (1.81), scaffolding specialist (1.14), suspended ceiling specialist (1.14), plumbers (1.62) and electricians (1.76) are quite above 1, which implies that there is an agreement. Also, from the results, the RAF of masons/bricklayers (3.95), painters (3.76) and joiners/carpenters (3.67) are highly above 1, which implies greater disagreement

Table 4:
PRAF of all the construction organisations

Categories of skilled workers	Engr	Q/s	Bldr	Arch	Sum EQBA	RAF	PRAF	Order of ranking
Equipment operators	2	2	1	1	6	0.29	92.66	1
Glaziers	3	1	3	2	9	0.43	89.11	2
Asphalt/tar sprayers	1	4	3	4	12	0.57	85.57	3
Insulating specialist	4	3	2	3	12	0.57	85.57	3
Fabricators	5	5	6	6	22	1.05	73.42	5
Scaffolding specialist	6	7	5	6	24	1.14	71.14	6
Suspended ceiling specialist	7	5	7	5	24	1.14	71.14	6
Plumbers	8	10	8	8	34	1.62	58.99	8
Electricians	9	8	10	10	37	1.76	55.44	9
Roofers	10	10	9	9	38	1.81	54.80	10
Terrazzo workers	12	9	11	12	44	2.10	46.84	11
Pipe fitters/layers	11	12	12	10	45	2.14	45.82	12
Refrigeration installers	13	14	15	13	55	2.62	33.67	13
Air conditioners	14	15	13	14	56	2.67	32.41	14
Welders	15	13	14	15	57	2.71	31.39	15
Iron benders	16	17	16	17	66	3.14	20.51	16
Tile fixers	17	16	17	16	66	3.14	20.51	16
Plasterers	17	18	18	18	71	3.38	14.40	18
Joiners/carpenters	19	20	19	19	77	3.67	7.09	19
Painters	21	19	20	19	79	3.76	4.81	20
Masons/bricklayers	20	21	21	21	83	3.95	0.00	21
Total							995.29	

*RAF: ranking agreement factor; PRAF: percentage ranking agreement factor Following the results of PRAF (%), the mean could be derived by dividing the sum of PRAF (%) by the total number of skilled trades to determine the skilled trades required by construction organisations. This was adapted from [13], [29].

$$\text{Mean; } \frac{995.29}{21} = 47.40$$

However, in relation to the PRAF and mean presented above, [3] mark the cut-off points for interpretation as follows; Disagree (below the mean but less than 10%); Undecided (below the mean but more than 10%); Agree (equal to mean); Strongly agree (above the mean). Therefore, the results which falls in the first and second levels should be dismissed, as it is not required by the construction organisations. Accordingly, from the above mentioned levels, PRAF of skilled trades such as; masons/bricklayers, joiners/carpenters, iron benders, welders, painters, plasterers, tile fixers, terrazzo workers, pipe fitters/layers, air conditioners and refrigeration installers, were below the mean, and their level of agreement ranges from undecided to disagree. Based on the outcome ten skilled trades; equipment operators, glaziers, insulating specialist, asphalt/tar sprayers, fabricators, scaffolding specialist, suspended ceiling specialist, plumbers, electricians and roofers are above the mean. From the results, the ten skilled trades were common between structural, finishing and service skilled trades. The results show equipment operators as the topmost skilled workers required by the construction organisations. This result agrees with the contention of [24] who affirmed that the demand of equipment operators is due to advances in technology and improved use of prefabricated components to have buildings completed within possible time. The results show that glaziers are one of the current skilled workers required in Nigerian construction organisations. [26], affirmed that with the increasing demand for curtain walling and glass finishes, there would be more demand for glaziers. The result also shows insulating specialist as skilled workers required by the construction organisations. [34], corroborated this result, asserting that the

increased demand for an insulating specialist is mainly to prevent costly moisture damage to building materials and reduces energy costs for operating refrigeration equipment. Thus, achieved a sustainable construction. The result also shows asphalt/tar sprayers as one of the current skilled trade required by construction organisation. [40], acknowledged that in a quest towards better pavement for road users and the environment, the demand for asphalt/tar sprayers would increase. The results also show that construction organisations rely on structural steel fabricator to create various structural steel products. This result is in agreement with [31] that structural steel is the leading green structural construction material which contributes to increasing energy efficiency and reducing targeted emissions. Scaffolding specialist was also indicated as one of the skilled trades required by the construction organisations. [18], [23], acknowledged that with the increasing focus to ensure safety and comfortable working space in the construction site, there would be an increase demand for scaffolding specialist. Suspended ceiling specialist was also revealed as a current skilled trade required by the construction organisations. [35], affirmed that the upward trend in demand for suspended ceiling specialist is as a result of modern-day structure which provide useful space for the distribution of heating, ventilation and air conditioning services, plumbing and wiring services, as well as providing a platform for the installation of speakers, light fittings, wireless antenna, CCTV, fire and smoke detectors, motion detectors, sprinklers and so on. The result also indicated plumbers as one of the skilled trades required by the Nigerian construction organisation. This result is supported by [2], who acknowledged that new design changes to modern-day buildings would result in an upward trend in demand for plumbers. Electricians are also indicated as a skilled trade required by the construction organisation, which agrees with [19] that due to electrical upgrades and modernisation of electrical installations, the demand for electricians would increase. Roofers are also presented as one of the skilled trades required by the construction organisation. This result is in line with [8] who acknowledged that as a result of advances in modern roofing

technology and techniques which are associated with a wide variety of benefits for different weather conditions and building styles, the demand for roofers would increase.

5 Hypotheses Testing

To achieve the final objective of this study mentioned earlier, three hypotheses was formulated. To test this hypotheses written below, Kendall's coefficient of concordance (W) was performed to estimate the degree of agreement between construction organisations' perspectives related to the ranking of each skilled trades, and whether this agreement is statistically significant. The range of the value W is between 0 and 1 (1 represents the perfect agreement between construction professionals, while 0 represents completely no agreement between construction professionals).H0. There is no degree of agreement between construction organisations towards the ranking of structural workers. The results in Table 5 highlighted structural skilled workers in Nigerian construction organisations. This category consist of eight skilled trades. The findings indicates that Kendall's coefficient is found to be 0.992 which represents

perfect agreement between construction organisations. While, the p-value is 0.000 which is below the threshold of 0.05 significance level. This revealed that there is a significant and strong degree of agreement between construction organisations towards the ranking of structural workers; that is the construction organisations shared similar values about the relative importance of these skilled trades. This may be attributed to the increasing construction activities in the study area. Thus, the null hypotheses was rejected

Table 5.

The degree of agreement between construction organisations related to the ranking of structural workers

Construction organisations	ENGR			Q/S			BUILDER			ARCH		
	S	RII	R	S	RII	R	S	RII	R	S	RII	R
Masons/bricklayers	301	0.634	20	109	0.606	21	258	0.607	21	223	0.603	21
Joiners/carpenters	307	0.646	19	110	0.611	20	262	0.617	19	229	0.619	19
Equipment operators	398	0.838	2	152	0.844	2	359	0.845	1	315	0.851	1
Iron benders	313	0.659	16	118	0.656	17	281	0.661	16	239	0.646	17
Fabricators	387	0.815	5	147	0.817	5	337	0.793	6	288	0.778	6
Welders	327	0.688	15	128	0.711	13	283	0.666	14	252	0.681	15
Roofers	358	0.754	10	132	0.733	10	319	0.751	9	274	0.741	9
Scaffolding specialist	379	0.798	6	146	0.811	7	341	0.802	5	288	0.778	6
Kendall's coefficient	0.992											
Sig.	0.000											

* Significant mean difference at 0.05 (95%) confidence level

a. H0: There is no significant degree of agreement between the construction organisations towards the ranking of finishing workers. The results in Table 6 revealed finishing workers in Nigerian construction organisations. This category consist of seven skilled trades. The results indicates that Kendall's coefficient is found to be 0.984 which represents perfect agreement between construction organisations. While, the p-value is 0.001 which is below the threshold of 0.05 significance level. This revealed that there is a significant and strong degree of agreement between construction organisations towards the ranking of finishing workers; that is the construction organisations shared similar values about the relative importance of these skilled trades. This results is expected because of the increasing options for decorative and soundproof materials which are environmentally friendly. Thus, the null hypotheses was rejected.

Table 6.
The degree of agreement between construction organisations related to the ranking of finishing workers

Construction organisations	ENGR			Q/S			BUILDER			ARCH		
	S	RII	R	S	RII	R	S	RII	R	S	RII	R
1. Painters	299	0.630	21	112	0.622	19	260	0.612	20	229	0.619	19
2. Plasterers	312	0.657	17	114	0.633	18	265	0.624	18	230	0.622	18
3. Glaziers	397	0.836	3	153	0.850	1	355	0.835	3	313	0.846	2
4. Suspended ceiling specialist	371	0.781	7	147	0.817	5	331	0.779	7	292	0.789	5
5. Tile fixers	312	0.657	17	119	0.661	16	277	0.652	17	245	0.662	16
6. Terrazzo workers	352	0.741	12	134	0.744	9	313	0.737	11	268	0.724	12
7. Asphalt/tar sprayers	407	0.857	1	148	0.822	4	355	0.835	3	307	0.830	4
Kendall's coefficient	0.984											
Sig.	0.001											

* Significant mean difference at 0.05 (95%) confidence level

b. H0: There is no significant degree of agreement between the construction organisations towards the ranking of service workers. The findings in Table 7 shows service workers in Nigerian construction organisations. This category consist of six skilled trades. The results indicates that Kendall's coefficient is found to be 0.948 which represents perfect agreement between construction organisations. While, the p-value is 0.002 which is below the threshold of 0.05 significance level. This revealed that

there is a significant and strong degree of agreement between construction organisations towards the ranking of service workers; that is the construction organisations shared similar values about the relative importance of these skilled trades. This may be attributed to the growing demand for thermal and acoustic insulation to reduce energy consumption and prevent echo and loud environment. Thus, the null hypotheses was rejected.

Table 7.
The degree of agreement between construction organisations related to the ranking of service workers

Construction organisations	ENGR			Q/S			BUILDER			ARCH		
	S	RII	R	S	RII	R	S	RII	R	S	RII	R
1. Plumbers	369	0.777	8	132	0.733	10	323	0.760	8	278	0.751	8
2. Pipe fitters/layers	355	0.747	11	131	0.728	12	310	0.729	12	271	0.732	10
3. Electricians	363	0.764	9	135	0.750	8	318	0.748	10	271	0.732	10
4. Air conditioners	332	0.699	14	125	0.694	15	284	0.668	13	256	0.692	14
5. Refrigeration installers	335	0.705	13	127	0.706	14	282	0.664	15	261	0.705	13
6. Insulating specialist	396	0.834	4	149	0.828	3	358	0.842	2	308	0.832	3
Kendall's coefficient	0.948											
Sig.	0.002											

* Significant mean difference at 0.05 (95%) confidence level

Overall results of the hypotheses testing revealed that a high agreement between construction organisations occurred in the ranking of the skilled workers. This was confirmed by high Kendall's coefficient obtained. Same results were supported by [28], [38], [41]. This proves that the construction organisations shared similar values about the relative importance of each of the tested skilled trades.

6. Conclusion

This paper identifies skilled trades through questionnaire sent to construction organisations. A total of 21 skill trades were identified from the literature reviewed and were used for questionnaire development. Then ten skilled trades which includes equipment operators, glaziers, insulating specialist, asphalt/tar sprayers, fabricators, scaffolding specialist, suspended ceiling specialist, plumbers, electricians and roofers were demonstrated from the results of data analysed to represent the skilled workers required by the construction organisations. The data analysis includes RII, RAF and PRAF for comparisons of rankings among construction organisations. Kendall's coefficient of concordance was used to evaluate the degree of agreement between construction organisations related to the ranking of each of the skilled workers. Scrutiny of the results revealed that the skilled trades that were ranked topmost are highly technical trades which are significant in the delivery of expected infrastructural developments in Nigeria. This confirmed with the perceived low productivity of Nigerian construction organisations. Drawing on this, efforts should be geared towards the supply of these categories of skilled trades for the benefits of all active labour market participants.

7. REFERENCES

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