**ADDRESING THE CHALLENGES OF ACHIEVING STANDARD WORKMANSHIP IN CONSTRUCTION PROJECT DELIVERY**

**ABSTRACT**

*Workmanship has constituted a serious challenge in construction project execution. Many of the artisans engaging in construction project do not acquire adequate training which have been identified as the major causes of poor workmanship in construction projects delivery. This research examines challenges of achieving standard workmanship in construction project delivery. The study utilized questionnaire survey, a quantitative technique to collect data from the participants. A total number of hundred (100) questionnaires were administered to respondents but only eighty (80) were returned and used for the research. The data was analyzed using Statistical Package for Social Scientists (SPSS). Means score and relative importance index were the specific descriptive tools employed. The results show inadequate training as the most ranked factor attributed to poor standard of workmanship in construction project delivery. The study conclude with a set of recommendations for addressing the challenges of inadequate workmanship in construction project delivery.*

**KEYWORDS: Challenges, Standard, Workmanship, Construction, Project, Delivery**

**INTRODUCTION**

Workmanship refers to the level of skills with which a job is accomplished or a product or an item is finished. Construction skills essentially include bricklaying, carpentry, plumbing, ironwork, electrical. Later the term ' workmanship' also started to apply to engineering and manufacturing (Porter S, 2005). Construction work or project involves complex and interrelated processes. It requires different parties or stakeholders coming together to work towards achieving the goal of delivering a construction project. These include the client, contractor, architect, engineers, quantity surveyor, and tradesmen; like bricklayers, carpenters, iron benders etc. The quality of the finished construction project or output is largely dependent on the degree or level of skills of the artisans employed on the project and also on supervision among others.

The quality of construction project could be deemed poor or inadequate when the project goals cannot be achieved; the work is not meeting the stated specifications and the users’ need or customer expectation is not satisfied. Quality challenges on construction projects are encountered most of the time as a result of poor workmanship. The world over, construction disputes come up among parties to the contract, for instance, between client and contractor due to construction defects arising from poor workmanship. For instance, in Malaysia, according to Abdul Razak et *al*. (2010) quality of the certain construction projects has not always been met. In the opinion of Kazaz and Birgonul, (2005) the satisfaction of quality in the construction projects delivery has always been a challenge also in Turkey.

Prominent among other factors responsible for non-achievement of quality standard of workmanship in construction project delivery include the use of poorly-skilled labour, use of emerging contractors, and a lack of commitment to quality achievement. Oni (2018) argued that construction artisan skills training has been neglected and no longer appreciated due to image problem in the society. Young people that are supposed to enroll into construction skills training now prefer to opt for riding commercial motorcycles as a means of economic survival. Apart from the fact that this option is associated with very high risks, it is also not sustainable at all. The two pathways for training construction artisan, namely the traditional apprenticeship system and the formal school system (Technical colleges) both are currently poorly patronized (Oni 2018)

In Nigeria, a good number of construction projects carried out are found to be having with poor workmanship issues . This development is attributed to inadequate training, poor supervision and working under pressure. The effectiveness of the construction industry in every country depends on the quality of the trained workforce to be able to achieve the quality work required (Muya, et al. 2004; Porter, 2005). According to David ,(2010).Poor quality in construction projects is a common phenomenon in Nigeria. The most important aspect of a quality project is the workmanship; unfortunately, poor quality workmanship can destroy projects already put in place (Iwaro and Mwasha, 2012). According to Kasim, (2009). most contractors in developing nations of the world are grappling with the challenges of of poor workmanship in construction project delivery. Certain percentage of the payment due to the contractors are usually being held back as guarantee against early defects appearance due to poor workmanship . (Shittu *et al.* (2013).

**METHODOLOGY**

**FACTORS RESPONSIBLE FOR POOR WORKMANSHIP IN CONSTRUCTION**

This section identifies and discusses the some variables that are connected to the factors responsible for poor workmanship in construction projects. They are as follows:

**Design Errors**

One of the typical design error commonly committed happen in an attempt to avoid exceeding initial construction costs estimate. Construction cost considerations occupy a very important role in designing buildings. Adjusting downward the size of columns, reducing the initial specified size of reinforcement bars and foundations details are the prevalent design mistakes in construction. Bilau,(2015). Submitted that this development will lead to uncertainty in the future where the structure cannot withstand the load and may finally fails. Sometimes faulty design is also a result of misjudgment, leading to assumptions or decisions that are not in line with the actual behavior of the structure.

**Inadequate skills and experience**

Oni (2014) submits that this is a major factor in this workmanship matters. Many construction skills trainees are not patient enough to fully acquire the needed competence level. This is not unconnected with the quest for money mindset predominant among our youths nowadays. Additionally, assessment of trainees before they are finally released to the market to operate independently is not standardized and also not regulated well by government. Due to paucity of construction workmen in the industry, some are engaged to carry out operations in areas they do not have sufficient experience

 **Communication challenges**

In the recent times, the industry has witnessed an upsurge of migrant artisans from neighbouring countries like Togo, Benin Republic. They are common in many construction sites in Lagos and Ogun states. This phenomenon has created another challenge in the area communication (Oni 2014). According to Al-Hazmi, (2005), different language between the foreign craftsmen and local supervisors causes the communication barrier on the site. This is because many foreign workers are not able to speak in local language fluently. This consequently led to misunderstanding thus negatively impact workmanship standard of the project involved.

**Working under pressure**

Atkinson,(2007).opined that insufficient time caused the construction projects executed to be rushed. A number of “show houses” on the site were required for many construction projects. Many concurrent works were carried out and inadequate checking had been carried out by the senior managers sequentially caused by the speed of working. As a result, the deficiency of workmanship had been happened. In short, working under pressure causes low quality of workmanship in construction.

**Inadequate Supervision**

Within Nigerian context, construction works are labour intensive. An estimated figure of 2.5 million people are engaged in construction works in the country. However, vast majority of these workers are not qualified and unskilled or partially trained. Therefore, additional burden of supervision and thorough oversight is required to ensure compliance to standard. So if the supervision is not very heavy right from inception to completion of each operation, probability of poor workmanship is very high. In Nigeria, construction site supervision is a very essential aspect of the work. The failure to plan the work and communicate with other sufficiently is essentially connected to increasing amount and cost of rework expended on project works.

 **Low wages of artisans**

Insufficient remunerations have been a significant factor contributing to the low performance and efficiency of artisans in the Nigerian construction sector. And this ultimately impacting their drive and willingness to carry out their duties. As a result, this diminishes the overall productivity and quality of work on projects. In line with Salisu (2006) viewpoint, it is observed that contractors do not compensate skilled workers fairly, which can be attributed to the limited resources and unfavorable economic conditions caused by ineffective leadership. Consequently, contractors are inclined to offer unfair wages, leading to a demotivated workforce and prompting them to seek employment in organizations that offer more attractive remuneration packages.

**Delay in payment of artisans’ wages**.

According to Hickson and Ellis, (2006). payment delays typically happens due to cash flow issues challenges experienced by the client or contractor. It may also be as a result of poor planning and management of project funds. Regardless of the cause of the payment delay, experienced workers tend to cause confusion and conflict, which then hinders the progress of the work. Ghoddousi, (2007). posited that late payment to contractors has a negative impact on the artisans working on site. It is a well-known fact that if construction artisans do not receive their wages as at when due, they feel dissatisfied and this can invoke disloyalty and dwindle their commitment to their duties. Definitely, this would bring down productivity.

**Lack of standard scale for artisan’s wages**

Within Nigeria environment, there is no standardized scale or regulated wages for the skill construction artisans. Thus, differential wages are paid in different states and construction sites across the nation. This situation is responsible for migration of artisans from an area of low wages to the places where they will get better remunerations for their labour. According to Aina and Adesanya , (2006). lack of incentive schemes in place for construction workers is one big factor also that demotivate construction site workers in a organization.

Abdulsalam,(2007). argued that, incentive schemes that would promote environmental responsibility with financial benefits should be provided to encourage more flexible working practices among the site operatives and also to promote an improved work-life balance to skilled workers. Non-implemented motivational incentives in most organizations, usually lead to to low performance of the skilled workers on their job Bernardin, (2005) asserted.

**TABLE4:2 RESPONDENTS LEVELS OF EDUCATION**

|  |  |  |
| --- | --- | --- |
| **Qualification** | **Frequency** | **Percentages (%)** |
| WAEC | 0 | 0 |
| ND/NCE | 0 | 0 |
| HND | 27 | 33.8 |
| BSC | 21 | 26.3 |
| MSC | 20 | 25.0 |
| PHD | 12 | 15.0 |
| TOTAL | 80 | 100 |

**Sources: Field survey ,2022**

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The table above shows that zero percent of the respondents are WAEC students and ND/NCE students respectively and 33.8% are HND students, 26.3% of the respondents are the BSC level, 25% of the respondents are also into MSC level while 15% are the PHD level who were participated to this research on challenges of achieving standard workmanship in construction project delivery. Where HND has the highest percentage of 33.8%, this implies that HND are the most respondents contributed on the challenges of achieving standard workmanship in construction project delivery.

**TABLE PROFESSION OF RESPONDENTS**

|  |  |  |
| --- | --- | --- |
| **position held presently** | **frequency** | **percentage (%)** |
| civil Engineering | 6 | 7.5 |
| Architecture | 18 | 22.5 |
| Quantity surveying | 15 | 18.8 |
| Building | 33 | 41.3 |
| Planner | 4 | 5.0 |
| Surveying and geo-informatics | 4 | 5.0 |
| Total | 80 | 100 |

**Sources: Field survey, 2022.**

The Table above shows that 7.5% of the respondents are civil engineering, 22.5% are Architecture, and 18.8% are Quantity surveying while 41.3% are Building and 5% are urban and regional planning students and surveying and geo-informatics respectively. The result implies that Builders and Architecture were many bear on this research on the challenges of achieving standard workmanship in construction project delivery.

Base on the figure 1 above, shows the types of organization/institution of the respondents, it can be observed that government ministry of works has the highest frequency with high percentage follow by construction firm while it follow consultant firm and tertiary institution respectively. This given us confidentiality that the fact and the real information that I maybe in need shall be rendered through the genuine respondents.

Base on the figure 2 above, it shows the age group of the respondents where age group between 31-40 years has the highest frequency while others is almost the same. This implies those age groups range between 31-40 were the most respondents who contributed to this research on challenges of achieving standard workmanship in construction project delivery.

**TABLE RESPONDENTS YEARS OF EXPERIENCE**

|  |  |  |
| --- | --- | --- |
| **Years of experience** | **Frequency** | **Percent** |
| 1-5 | 19 | 23.8 |
| 6-10 | 43 | 53.8 |
| 11-15 | 11 | 13.8 |
| 16-20 | 5 | 6.3 |
| 20 and above | 2 | 2.5 |
| Total | 80 | 100.0 |
|  |  |  |

**Sources: Field survey, 2022.**

The Table 4:4 above shows that 23.8% of respondents has a constructing experience ranging between 1-5 years, 53.8% has experience ranging between 6-10 years while 13.8% of the respondents has experience ranging between 11-15 years and 6.3% had experience ranging between 16-20years while 2.5% experience ranging between 20 years and above. This shows that considerable percentage of the respondents has a better experience of the constructing the challenges of achieving standard workmanship in construction project delivery.

**TABLE FACTORS RESPONSIBLE FOR POOR WORKMANSHIP IN CONSTRUCTION PROJECT DELIVER**Y

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **FACTORS**  |  |  | **SUM** | **∑FX** |  | **MEAN RII** | **RANK** |
| Inadequate training |  |  | 80 | 442 |  | 5.53 1.11 |  1st |
| Poor supervision |  |  | 80 | 388 |  | 4.85 0.97 | 2nd |
| Inadequate skills and experience  |  |  | 80 | 382 |  | 4.78 0.96 | 3rd |
| Design error |  |  | 80 | 380 |  | 4.75 0.95 | 4th |
| Working under pressure |  |  | 80 | 367 |  | 4.59 0.92 | 5th |
| Lack of standard salary scale for skilled worker. |  |  | 80 | 355 |  | 4.44 0.89 | 6th |
| Language barrier to communication |  |  | 80 | 346 |  | 4.32 0.86 | 8th |
| Unsuitable construction material |  |  | 80 | 338 |  | 4.23 0.85 | 9th |
| Low wages of skilled workers |  |  | 80 | 317 |  | 3.97 0.78 | 10th |
| Unsuitable construction equipment |  |  | 80 | 316 |  | 3.95 0.79 | 11th |

**Sources: Field survey, 2022.**

Base on the Table 4:5 above, the research also attempted to find out the factors which may be responsible for poor workmanship in construction project delivery. In this analysis, it can be observed that the level of agreement is greater than the level of disagreement in all cases, which means that all the respondents were satisfied by the factors responsible for poor workmanship construction project delivery.

Further, the last two columns show the means and rank of the respondents in descending order of magnitude on the factors responsible for poor workmanship in construction project delivery. It can observed that inadequate training with mean 5.53 was ranked as the most common factors responsible for poor workmanship in construction project delivery, while poor supervision with mean 4.85 is second rank, while inadequate skills and experience with mean 4.78 is the third rank, while design error and working under pressure with mean 4.75 and 4.59 were the fourth and fifth rank respectively, while other factors were ranked as least common factors responsible for poor workmanship in construction project delivery.

It can be concluded that all these factors listed above are all fantastic responsibility for poor workmanship in construction project delivery.

**TABLE IMPLICATIONS OF POOR STANDARD OF WORKMANSHIP ON CONSTRUCTION PROJECT DELIVERY**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IMPLICATIONS** |  | **SUM** | **∑FX** |  | **MEAN RII**  | **RANK** |
|  |  |  |  |  |  |  |
| Inadequate value for money |  | 80 | 482 |  | 4.88 1.21 |  1st |
| Internal staining, mold growth and fungal on external walls |  | 80 | 468 |  | 4.85 1.17 |  2nd |
| Increased total life cycle cost on the project |  | 80 | 456 |  | 4.80 1.14 |  3rd |
| Deterioration of roof covering |  | 80 | 451 |  | 4.79 1.13 |  4th |
| Death of occupants |  | 80 | 396 |  | 4.77 0.99 |  5th |
| Poor aesthetics |  | 80 | 393 |  | 4.75 0.98 |  6th |
| Total collapse of structure |  | 80 | 383 |  | 4.74 0.96 |  7th |
| Project abandonment |  | 80 | 378 |  | 4.72 0.94 |  8th |
| Unsafe structure |  | 80 | 370 |  | 4.63 0.51 |  9th |
| Cost overrun |  | 80 | 360 |  | 4.5 0.90 |  10th |
| Cracking |  | 80 | 364 |  | 4.55 0.91 |  11th |
| Injuries to occupants |  | 80 | 352 |  | 4.40 0.88 |  12th |
| **Sources; field survey,2022.** |  |  |  |  |  |  |

The general observation of the above analysis was base on the factor responsible poor workmanship in construction project delivery. It was known that the respondents were requested to rank from 1 to 5 (i.e. strongly disagree, Disagree, Neutral, Agree, strongly agree).

The means of each of the implication were computed and used to rank the implications with respect to their significant contribution to the implications of poor standard workmanship in construction project delivery. From the result which is shown in table 4.6 above, inadequate value for money with mean 6.03 is the first rank while internal staining, mold growth and fungal on external walls with mean 5.85 is the second rank, while increased total life cycle cost on the project with mean 5.70 is third rank. While deterioration of roof covering and death of occupants with mean 5.64 and 4.95 respectively were the fourth and fifth rank, while other factors were rated accordingly, it can be observed that cost overrun, cracking and injuries to occupants with mean 4.58 and 4.55 and 4.40 were ranked as least common factor responsible for poor workmanship in construction project delivery. It also observed that the percentage of respondents who are strongly agree and agree are greater than the respondents who are neutral, disagree and strongly disagree hence all this implications listed above has a role to play in various construction project delivery.

**TABLE APPROACHES FOR MITIGATING THE CHALLENGES OF POOR WORKMANSHIP IN CONSTRUCTION PROJECT DELIVERY**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **APPROACHES** | **SUM** | **∑FX** | **MEAN** | **RII** | **RANK** |
| Proper manpower management | 80 | 416 | 5.20  | 1.04 | 1st |
| Strict supervision | 80 | 398 | 4.98  | 0.99 | 2nd |
| Adequate training and education | 80 | 383 | 4.79  | 0.96 | 3rd |
| Launching of initiatives to improve the quality and availability of instructors. | 80 | 376 | 4.71  | 0.94 | 4th |
| Proper communication between parties involved | 80 | 370 | 4.63  | 0.94 | 4th |
| Proper design  | 80 | 379 | 4.74  | 0.95 | 6th |
| Train the trainers to create new knowledge and improve teaching standards. | 80 | 372 | 4.65  | 0.93 | 7th |

**Sources: Field survey, 2019.**

Table above shows the frequency distribution, the mean, the relative importance index and the ranks of the respondents on the research of the approaches for mitigating the challenges of poor workmanship in construction project delivery. It can be observed that proper manpower management with mean 5.20 is the rank which is going b considered most in this research, while Strict supervision with mean 4.98 is the second rank which it was suggested should be second approach for mitigating the challenges of poor workmanship in construction project delivery. While Adequate training and education and launching of initiatives to improve the quality and availability of instructors in training need in a mission mode with mean 4.79 and 4.71 were probably rated as third and fourth rank respectively. While Proper design and Train trainers to create new knowledge and improve teaching standards and proper communication between parties involved with mean 4.74 and 4.65 and 4.63 were also ranked respectively as the least common strategies for bridging skills gap for delivering green buildings in Nigeria. It can also be observed that those respondents that deviated from each of the approaches were computed as standard deviation which was shown in the second to the last column in the table 4.7 above.

**CONCLUSION**

This study investigated the challenges of achieving standard workmanship in construction project delivery with a view of mitigating them, the result above shows that inadequate training, poor supervision, design error, inadequate skills and experience, language barrier to communication, unsuitable construction equipment’s, working under pressure, low wages of skilled workers, delay in payment of skilled workers wages. This research advocates formulation of policies that would regulate construction workmen wages. It also suggests that incentives be provided to encourage more interest of youth in enrolling in construction skills training. Site supervision also should be given adequate provision in planning for projects

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