

The effect of unskilled labourers on the construction productivity

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Abstract:

Productivity in the construction industry is a critical factor in project success or failure. However, the construction industry is experiencing productivity challenges emanating from the unskilled worker's usage. This study sought to identify the effects of using unskilled labour on construction output. The study used the qualitative research approach by using semi-structured interview questions to solicit information from 32 construction firms operating from the Northern Cape and Free State Provinces of South Africa. Data received were analyzed through thematic content analysis. Data was collected from the participants in only two provinces in South Africa; however, the findings may be applicable in other provinces. The findings indicate that contractors do not see only the adverse side of utilizing unskilled labour on their projects but only consider its positive aspects. Some of the positive effects identified are low wages paid, financial gain, and training on the job. The adverse effects are reworks, health and safety compliance challenges, poor communication, constant supervision, spending more time on task execution, and training time. Again it was found that, although contractors are aware of the consequences of utilizing unskilled labourers on their projects, they still use them, citing reasons such as the lack of skilled labourers, not all activities required skilled labourers, and being able to achieve project objectives. There is an urgent need to educate contractors on the implications of using unskilled labour on projects. The consequences of using unskilled labour may severely affect the company in the long run compared to the immediate gains experienced. Contractors should regularly improve their workers' skills to enhance their task execution to improve their construction productivity and maximize profits.

Keywords: Contractors, labour, productivity, skilled, unskilled

1 Introduction

Productivity in the construction industry could be portrayed as the amount of competence with which assets are managed to finish a particular project within a cut-off time and a given standard (Loera *et al.*, 2013). There are various factors that should be adopted to improve productivity on construction sites. The steps to improve productivity should involve the workers' efficiency and effectiveness because it is not practical to yield an amount of work if it is not completed without any quality standards (Loera *et al.*, 2013). A loss in productivity occurs when a contractor does not achieve its intended production rate (Gibson, 2015). Productivity and effectiveness are of most importance in the framework of the construction industry. Hence, a contractor is expending extra exertion per unit of production than initially scheduled (Gibson, 2015).

Gibson (2015) states that productivity and effectiveness are of great importance in construction and engineering contracts concerning all sizes. Construction contractors are naturally paid for labour completed with terms that follow the contract. Furthermore, Makhene and Thwala

(2018) added that South Africa only has 10% of the artisans that it had 24 years ago, before Apartheid, and approximations are that South Africa has a 40% shortage of artisans now. This has coerced construction companies working on significant projects to import artisans from Malaysia, Ireland, and India (Matues et al., 2014). South Africa is a developing country, and to attract positive economic growth in terms of infrastructure, skilled artisans will have to be considered. According to Chetty (2017), the deficiency of training, inexperienced administration, lack of planning, unproductive quality management, and the absence of maintenance motivating forces are some of the components that have added to the loss of talented artisans in the construction industry. This is a serious problem because it negatively affects project performances, project time, and maintenance. Makhene and Thwala (2018) have previously stated that one of the most significant challenges facing the construction industry is attracting and retaining skilled labourers within South Africa. The skilled labourers continue to decline whilst project owners pressure the contractors for lower costs and faster schedules through their various build delivery processes. As a result, contractors have increased the use of less-skilled labourers in projects that, in return, costs them money and time (Makhene & Thwala, 2018). What rather lacks from previous studies is how unskilled laborers' use impacts a project's deliverables, hence the need for this study.

2 Literature Review

2.2 The effect of Unskilled labourers on the construction project's output

Labour productivity is probably the best indicator of the efficiency of production. Higher efficiency levels typically convert into superior profitability (Rojas, 2008). A practical improvement in labour efficiency is additionally connected with financial progress, as it creates increments in compensations not caused by inflation and wages (Rojas, 2008). According to Chetty (2017), the absence of training, inexperienced management, lack of planning, inadequate quality management, and the absence of retention motivators are a portion of the elements that have added to the loss of skilled artisans in the construction industry, leaving us with large numbers of unskilled labourers. Unskilled workers negatively affect activities on-site, affecting project performances, project time, and quality of work completed (Zannah, 2017). Non-Productivity in numerous forms hurts construction projects (Alwi *et al.*, 2002). Rework is a part of non-productive activities that negatively affect costs and negatively impact productivity in its entirety (Emuzi & Smallwood, 2011). Emuzi and Smallwood (2011) argue against the fact that as much as 49.6% of construction operative time may be devoted to non-productive activities. Ying (2004) states that low productivity in the construction industry has been a great concern for quite some time, and a few studies have been centered around identifying the productivity's factors.

The construction clients have sometimes been hindrances to construction development efficiency due to their insufficient knowledge of construction procedures, including contractors' work (Ying, 2004). Also, being an outdoor industry, construction execution is typically definitely influenced by the climate conditions, whereby unskilled workers do not have the adequate skill to work under these conditions (Ying, 2004). Notwithstanding the variables depicted above, health and safety legislation, procurement arrangements, and codes of practices are further external elements affecting site practice and productivity, having a terrible impact on the construction industry (Shanmuga, 2017). In the internal classification, the management deficiencies could bring about a misuse of assets with ensuing misfortunes in productivity; adoption of advanced technology and training for the unskilled labourers would improve productivity (Ying, 2004).

2.3 The effect of unskilled labourers on contractors

Labour shortage in the construction industry will cause the construction time frame to be delayed (Essays, 2018). This will cause the construction time frame to be deferred due to the work deficiency in the construction industry. Zannah (2017) states that essentially if all the construction works and progress can run appropriately by complying with the schedule, it will not cause any delay in construction. The construction period is likely to be postponed because of the miscommunications between the contractor and unskilled labourer. The unskilled worker has never got any proper training to experience issues in correspondence between them (Zannah, 2017). Also, the unskilled labourer cannot perform well because of the more complicated project since he works without skills and experience and has never been prepared before. Chetty (2017) reiterates that the unskilled worker cannot finish the works according to the customer's standard requirements; thus, after assessment and inspection, the construction works need to be redone, which negatively affects the project's timeframe. When the project is not completed within the agreed time frame, the contractor needs to pay the penalties to the clients and start the restoration works; therefore, it can directly influence the rate of construction progress (Chetty 2017).

Edum-Fotwe and McCaffer (2000) state that labour shortage will be difficult in controlling and dealing with the time, cost, and quality during the project's execution. In a project, the contractor will invest most of his time finding a skilled labourer, delaying the construction time on site. By utilizing unskilled labourers, the construction time is not under control because of the complications in correspondence with the unskilled labourer (Edum-Fotwe and McCaffer, 2000). They need to take some time and acquaint themselves so that the unskilled labourer can comprehend the best approach to begin the works and finally drag out the construction time frame. When the contractor does not have enough skilled labourers, they will most likely be unable to finish the construction on schedule (Edum-Fotwe and McCaffer, 2000).

3 Research Methodology

A qualitative research approach was chosen for this study. According to Creswell (2007), qualitative research focuses on the presently happening phenomenon or has recently happened in nature. The qualitative method is utilized to uncover patterns in contemplations and assumptions and go further into the research issues. This approach was chosen for this research because the study deals mainly with non-numeric information, which entails a series of interviews to fulfill the research objectives. Thus analyses could be made from individuals who have experienced and witnessed the phenomena and enable the researcher to understand the effects of unskilled labour on contractors and why they use unskilled labours on their projects, despite the foreseeable consequences.

The participants in this study are roleplayers working for construction firms such as firm owners, construction managers, site managers, artisans, sub-contractors, and foremen actively involved and directly linked to the pre and post-construction stages of their projects. This study includes construction firms operating from the Northern Cape and Free State Provinces in South Africa. Convenience sampling, which is a non-probability sampling method, was used for this study. Thus the researcher chose the participants as per accessibility or convenience. Convenience sampling was used for this study because it is the most popular technique, and it is simple, speedy, and the least exorbitant strategy (Lauri, 2011). Therefore, any participant

who owns or executes a construction project for a contractor within the research jurisdictions and readily available for the interview was selected. Interviews are usually utilized in qualitative research in a detailed investigation concerning a specific situation or issue.

Due to the current global pandemic, the coronavirus, and associated regulations such as social distancing and travel restrictions, telephone interviews were used to get information from the participants willing to partake in the research. According to Blumberg et al. (2008) telephone interviews are becoming indispensable in modern research as it is relatively cheaper and can reach wider participants, compared to face-to-face interviews. In all, 40 construction firms were contacted for an interview, of which 32 responded. According to Creswell (2014), the first step in qualitative data analysis is reading or listening and memorizing the data by making notes and summarizing what has been gathered. The next step consists of moving from reading and memorizing to describing, classifying, and interpreting the data. Here, the researcher builds detailed descriptions, develops themes, and provides an interpretation in light of their views or the views expressed in the literature (Creswell, 2014). This is done by dividing the research objectives into sections. This makes it easier to interpret the data because each section is thoroughly filled with questions enough to make a concrete conclusion on the research topic's objectives. The researcher linked the interpretation of the research discussed in the literature review. In the final phase, the researcher represents the text's data, tabular or in figure form (Belotto, 2018). The suggestions proposed by Creswell (2014) and Belotto (2018) were adopted in analyzing the data gathered for this study. The features of the participants are indicated in Table 1.

Table 1: Participants demographic features

Respondents	Frequency	Percentage	Respondents	Frequency	Percentage
Gender			Work experience		
Male	29	91%	1 to 5 years	3	9%
Female	3	9%	6 to 10 years	17	53%
Total	32	100%	11 to 15 years	7	22%
Education			over 15 years	5	16%
None	7	22%	Total	32	100%
Matric	18	56%	Respondents profession		
Diploma	4	13%	Contractors	21	66%
Bachelor degree	2	6%	Site managers	2	6%
Honours degree	1	3%	Subcontractors	7	22%
Total	32	100%	Foremen	2	6%
			Total	32	100%

From Table 1, the majority (91%) of the participants are males, 56% of them are matric certificate holders, 53% have been working in the construction industry between 6 to 10 years, and 88% are firm owners. The findings portray the notion that the construction industry is male-dominated. Again, since firm owners are in the majority, the findings are more reasonable as they expressed an accurate opinion on the effect of using unskilled labours and why they make use of unskilled on their projects.

4 Findings

4.1 Effects of unskilled labourers on productivity

Participants were asked to express their views on whether the engagement of unskilled labours affects construction productivity. Thirty-two percent (32%) answered negatively whilst 68% answered in affirmative, as shown in Table 2.

Table 2. Unskilled labourer's effect on a project productivity

Yes	No
68%	32%

The researcher then asked a follow-up question for the participants to express their opinions on any effect unskilled labours could have on their projects. The researcher then categorized the responses into positive and negative effects as indicated in Tables 3 and 4.

Table 3. Positive Effects of unskilled labourers

Positive effects	Frequency	Percentages
Low wages paid	16	42%
Financial gain	12	32%
Training on the job	10	26%

As indicated in Table 3, most (42%) believe that unskilled labours are cheaper than skilled labours; thus, it would be advantageous to pay less for task execution. Again, 32% of the participants linked positive effects of using unskilled labour to a firm's financial gain, whilst 28% believe unskilled labour could be trained to execute the assigned task perfectly.

Table 4: Negative Effects of unskilled labourers

Negative effects	Frequency	Percentages
Reworks	15	31%
Health and safety compliance challenges	8	16%
Poor communication	3	6%
Constant supervision	11	22%
Spending more time on task execution	7	14%
Training time	5	10%

On the other hand, some of the adverse effects of using unskilled labours identified from the participant's responses are shown in Table 4. These are reworks (31%), Constant supervision (22%), health and safety compliance challenges (16%), spending more time on task execution (14%), poor communication (6%), and training time needed (10%).

4.2 Engagement of unskilled workers on projects

The participants were then asked whether they had ever used unskilled labours on their projects. As indicated in Table 5, the findings show that 95% of the participants admitted to engaging unskilled workers on their projects, whilst 5% stated otherwise.

Table 5. Engaging unskilled workers

Yes	No
95%	5%

A further question was asked regarding why they use unskilled labour despite its implications on their project's productivity. This question was asked to enable the researcher to understand the underpinning reasons why contractors use unskilled workers as they are aware of its negative consequence when it comes to construction productivity. The responses received were then categorized into three main themes, as shown in Table 6. From Table 6, 41% of the participants believe that it is not all project activities that required skilled workers to be executed, 35% believe they employ unskilled workers because of lack of skilled labourers, and 24% mentioned the ability of unskilled workers to achieve project objectives as reasons.

Table 6: Motivating factors for using unskilled workers

Motivating factors	Frequency	Percentages
Lack of skilled labourers	13	35%
Not all activities required skilled labourers	15	41%
Achievement of the project objectives	9	24%

5 Discussion

5.1 Effect of unskilled labourers on productivity

5.1.1 Positive effects

Theme 1: Low wages

Participants believe that unskilled workers provide a cheap source of labour; therefore, engaging them would be wise as they execute the work with proper supervision. Participants 4 and 8, who are subcontractors, indicated unskilled worker's engagement could be a good thing because they could be paid as low as half of the amount that skilled workers would charge. As participant 4 narrates;

"I think it is not a bad idea for using unskilled workers because they charge a low amount as compared to skilled workers."

Them 2: Financial gain

On the other hand, some participants mentioned the firm's potential financial gain when unskilled workers are used. Participants 12, 14, and 21 opined that if you pay workers less, your expenses in terms of worker's compensation would be reduced, leading to extra savings for the firm. In support of these assertions, participants 24 noted that using unskilled workers reduces their expenditure. As participant 24, a contractor narrates;

"I believe if you make use of unskilled workers in a combination of skilled workers reduces your financial burden and increases your profit in some cases."

Them 3: Training on the job

Again it was revealed that one of the positive effects of using unskilled workers is their ability to learn on the job and gradually become perfect in task execution. Looking at the relatively cheaper expense, it worth engaging them and train them to execute the task. Participant 6 stated that training them would let them know what is expected of them and how the work should be done. As participants 6 (foreman) narrates;

"if we can all do our part, we will be able to mitigate the situation of unskilled labourers. With training, skill development, and good management, we can get there."

Participant 2 (contractor) responded that as a company, they wanted to ensure that they trained the workers so that they maintained the company reputation by providing good quality of work to the clients. Again participant 8 (contractor) stated that they source external firms for training their workers, such as safety officers and foremen who were employed as unskilled workers. Others agreed to this, saying that they (the foremen) and the site officers were mainly involved in providing training to unskilled labourers. Participants 13 stated that skilled workers could be trained by engaging them in a combination of skilled workers. In this way, unskilled workers gained knowledge through observing the skilled workers and implementing the work

physically. Training these workers would have a positive effect on productivity and quality, which instigates a positive, vibrant atmosphere on-site. These findings imply that contractors consider financial gains as one of the main reasons they use unskilled workers, neglecting the future consequences they may experience on their project's output. It has been suggested by Makhene and Thwala (2018) that as a result of low wages paid to unskilled workers, contractors in South Africa make use of them intending to maximize profits; however, it rather costs contractors money and time in the long run. Again Ofori (2015) suggests that although less-skilled workers may come as cheap to contractors, they may also cause additional financial expenses.

5.1.2. Negative effects

Theme 1: Reworks

Reworks was the significant negative effect of unskilled workers on project productivity mentioned by the participants. Some participants stated that unskilled workers usually make huge mistakes initially, affecting project quality due to a lack of task execution skills. Since the firms want to produce good quality, they are forced to redo some of the works to achieve the quality standard. Participants 3, 7, 9, and 10 stated that they had experienced these in some of their projects, where newly recruited less skilled tillers made mistakes, and they had to remove all the floor tiles and redo them, causing them a substantial amount. As describe by Participants 9 (a contractor);

"In one of my projects, I engaged tillers whose rates per square meter were low but less experienced. Unfortunately they made mistakes and I had to replace the floor tiles in some of the rooms. It was very difficult for me but I had to do it since the project manager rejected the work."

The above findings support Gibson's (2015) finding that contractors struggle to control the low quality of work produced by unskilled workers making them lose money in the process through reworks. Rojas (2008) suggests that there is no assurance regarding the quality of work executed by unskilled workers complying with standard requirements because they are not specialists, which often raises problems for the contractors. Utilizing unskilled creates more problems for a company because an additional cost would be incurred during construction as defective works may become rampant, leading to late project completion (Das, 2015). Rework is a part of non-productive activities which affect project costs negatively (Emuzi & Smallwood, 2011).

Theme 2: Constant supervision

Constant supervision of unskilled workers at the site to enable execution of tasks to befit the project quality requirement is also a problem identified. Participants stated that unskilled workers need to be monitored to ensure they comply with the requirements. Participants 7 gave an example of a situation where the foreman needs to be at the site to ensure workers are doing what is right, which may not be necessary if workers have the skills and experience to do the work. As she narrates;

"At times some the workers who are not familiar with the work after completing an assigned work have to sit and wait for the supervisor to show them what to do next, which sometimes lead to time wastage in project execution."

This problem was also raised by participant 20, in that there is a waste of time on unskilled laborers' supervision as one has to monitor whether they are doing the right thing constantly.

When the supervisors do not ensure that the workers are productive, they spend time idling and becoming tired easily and feel entitled to take more breaks than others. Any process that incurs cost but does not add any value to the construction project, such as unnecessary supervision, can be defined as waste, which is known as a non-productive activity (Castillo *et al.*, 2018). Unskilled workers spend too much time on non-productive activities, and they ended-up not keeping up with the program as required. Hickson and Ellis (2013) stated that as much as 49.6% of construction operative time is devoted to non-productive activities such as wasting time supervising workers and time used for task execution.

Theme 3: Poor communication

Other participants identified poor communication as a feature of unskilled workers. Because they are untrained in project communication, they might have finished activities or require materials for task execution but may not communicate this to the appropriate authorities and wander around doing unnecessary activities. As commented by Respondent 11;

"If there is no clear instruction from the foreman, it results in inactivity with labourers having to wait around and argue unnecessarily."

Participants 12 and 16 also asserted that most unskilled workers do not understand the essence of timely communication in project environments and delay activities due to delayed communication regarding tools or materials they need to execute tasks. Ying (2004) suggests that construction productivity is negatively affected through waiting for feedback on changes requested due to poor communication channels. Construction projects often delay because of miscommunication between contractors and unskilled laborers because unskilled workers are rarely trained or lack experience in issuing correspondences (Zannah, 2017).

Theme 4: Health and safety compliance challenges

Participants mentioned that when labourers are not complying with health and safety regulations, the Municipality could suspend construction; due to non-compliance. This would have a direct effect on the contractor and productivity. Participants 3, 8, and 12 stated that most unskilled workers do not understand the implications of not complying with the safety regulations. Thus, they may have been supplied with safety gadgets yet would not use them. Participant 8 narrates;

"One of the problems is that these unskilled workers have no knowledge about safety regulations, so even give them the PPEs but they do not use them, especially when the site supervisor is not around."

Shanmuga (2017) states that lack of health and safety legislation compliance affects site productivity as workers may be injured and thus delay task execution. In some extreme cases, the entire site would be shut down due to a lack of health and safety compliance.

Theme 5: Spending more time on task execution

According to the interviewees, unskilled labourers spend more working hours on task execution as they did not understand the work situation and that it had to be explained to them. Participants 11 and 13 responded that the loss of time influenced the production of the project very badly. The influence of lost time on a project makes it difficult, as you have to increase resources, labourers have to work overtime to catch up with time. Thus, more money would be spent to catch up with time. Participant 17 said that the loss of production time on the site affects the project's financial projections because you have to hire more people to cover the lost

time. Again, participants 21 and 24 said that; poor management of unskilled workers results in time lost on the project; thus, it is important to make sure that as a contractor, you do not employ unskilled labourers without employing skilled labourers. Skoyles (1987) suggests that a skilled worker's technique is more powerful than an unskilled worker; thus, a skilled labourer can execute tasks quicker than an unskilled laborer and shortens project duration. Skoyles (1987) further suggests that while a skilled labourer can lay 900 bricks a day, an unskilled labourer will just lay 700 bricks, given the same timeframe. Edum-Fotwe and McCaffer (2000) found out that unskilled workers usually take time to finish activities because they need time to find the best approach to begin the work, causing the project schedule to delay.

Theme 6: Training time

Again participants cited the time frame needed to train unskilled labourers as a concern as the training time further delay project execution. However, respondent 11 opined that although time is required to train unskilled workers, they eventually get the work done. As participant eleven (11) states;

"There would be inactivity while training occurred, but that productivity would be higher than before after they had accrued the necessary knowledge."

Other participants, including 4, 7, and 10, agreed that it did not help with production when more unskilled labourers were deployed due to the time needed for training; thus, they should instead be working alongside the skilled labourers to increase the unskilled labourer's knowledge. According to Chetty (2017), the lack of training and inexperienced management caused unskilled labourers to spend too much time on productive activities. The purpose of the Construction Management Training Program is to increase contractor's capacity and ensure that they are genuinely competent in understanding the requirements and the construction activities of a project to lead the skilled and unskilled workers in completing their tasks adequately (Rui *et al.*, 2015). Contractors are affected negatively due to delays and lost time they need to train unskilled workers, making them incur unnecessary costs.

5.2 Reason for using unskilled labours on construction projects

The majority (95%) of the participants believe that they use unskilled labourers because not all activities required skilled labourers. Participants 4, 8, 11, and 15 stated that unskilled workers could perform labour intensive work. As suggested by Participant 15;

"They perform the "difficult" part where you need to rely on them to complete the work because it requires physical attention."

Other participants (14, 18, and 19) indicated that even though unskilled workers tend to be less productive, they do get the job done, and thus, in the long run, the project objective is achieved. As participants indicated

"The unskilled labourers' usages do not prevent the achievement of their main project objective because, at the end of the day, the job gets done."

Other participants indicated a lack of skilled labour in the South African construction industry as the main reason they engage unskilled workers on their projects. For instance, participants 3 and 7 indicated in most of their projects, they are required to use local labours who are mostly unskilled as skilled workers are hardly found in those localities. This means they are forced to use local people and train them on the job. Again, participant 12 indicated that they normally

engage the unskilled labourer to execute tasks requiring highly skilled workers and stated examples as site security, site cleaning, and material arrangement. However, participants 18 indicated that they try to engage people who have experience since it is best to do the right thing initially, but due to their inability to get skilled workers, they fall on unskilled workers to do the job. Makhene and Thwala (2018) also suggest that one of the main challenges facing the South African construction industry is attracting and retaining skilled workers. The continued decrease in skilled workers forces contractors to increase the usage of less-skilled workers in projects, with the consequences of increased cost and time. Again Chetty (2017) opines that lack of motivating factors has propounded the loss of talented artisans in the construction industry, leaving no option for the contractors to rely on unskilled workers.

6 Conclusion and Recommendations

Productivity in the construction industry is paramount for efficient project completion. Lack of productivity affects the project, contractors, clients, and end-users because it brings additional costs to the client and contractors and deprives them of utilizing the facilities. To ensure effective project execution that meets all the stakeholders' requirements, the people engaged in the project should be knowledgeable and experienced in executing the assigned tasks. This study sought to understand the effect of using unskilled works by contractors on project output. The findings indicate that contractors do not see only the adverse effects of using unskilled workers on their projects; but also positive effects. Some of the positive effects identified are low wages paid, financial gain, and training on the job. The adverse effects are reworks, health and safety compliance challenges, poor communication, constant supervision, spending more time on task execution, and training time. Although contractors are aware of the consequences of using unskilled labourers on their projects, they cited reasons such as the lack of skilled labourers, not all activities required skilled labourers, and achieving project objectives as motivation factors. Therefore, it is recommended that the construction industry roleplayers intensify awareness creation on the negative impact of unskilled labourers on the construction industry. The construction industry and the government sector may combine with higher education institutions to implement more short courses and training for all construction workers to improve their skills. Again, construction vocational training institutions should be established to train workers to increase skilled workers employed by contractors.

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