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Research Article

Project Communication Medium and Construction Project Success in North-Central, Nigeria

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ABSTRACT

Construction project failures remain a global challenge despite continuous efforts to prevent it. Based on this empirically established view, this study evaluated project communication medium and construction project success in Nigeria. To achieve the purpose of the study, survey research was conducted among construction project managers in Northcentral, Nigeria. The source of data was primary which was collected through a structured questionnaire while data gathered were analysed using descriptive and inferential statistics. Findings established that formal communication medium significantly affects construction project success in Nigeria and that informal communication medium significantly determines construction project success. The study concludes that both formal and informal communication mediums are germane however, formal communication should be pronounced for record purposes as well as for checks and validation of claims that can lead to conflict. It was recommended that effective communication via both formal and informal mediums should be encouraged, but proper guidelines should be spelt out.

Keywords: Communication medium, Construction Company, Construction manager, Construction project success, Project.

Introduction

The essential role that construction firms play in driving active infrastructural development has been widely recognized as crucial for the advancement of nations (Akinbode et al., 2024; Albtoush et al., 2022). Specifically, the construction sector holds a significant position in any economy as it contributes substantially to socio-economic growth by boosting the Gross Domestic Product, generating employment opportunities, and fostering sectoral advancements, among other benefits (Rahardjo, Wang, Yeh & Chen, 2023; Khaertdinova et al., 2021; Serogina et al., 2021). Despite the numerous advantages of promoting infrastructural development through construction firms, some countries face a shortage of physical structures for various reasons, one of which is project failure (Stretton, 2023). Addressing project failure in construction has been an ongoing challenge, with efforts focused on preventing it or minimizing its occurrence (Elshaikh et al., 2021). Mitigating project failure ultimately leads to increased construction project success. Success in construction projects, as Neyestani (2016) explains, involves completing projects on time, within budget, and to the client's satisfaction, while Albtoush et al. (2022) argue that success should also encompass quality, cost, time, contract, and external factors to meet the expectations of all stakeholders (Stretton, 2023; Volden & Welde, 2022). Therefore, construction project success is defined by the completion, delivery, and usefulness of a project to meet the desires of various stakeholders. However, not all construction projects proceed smoothly for various reasons. Research (Akinbode et al., 2024; Stretton, 2023) has highlighted several factors, one of which is communication issues. Effective communication among stakeholders is essential for successful construction projects (Pinto & Pinto, 1990). Inappropriate communication methods can hinder projects and lead to setbacks in achieving success. Stretton (2023) notes that project failures have occurred due to improper communication channels that kept stakeholders uninformed about the project's progress. Various types of communication exist in projects, including vertical, horizontal, formal, informal, and collaborative communication. Project communication aims to facilitate

project execution by exchanging information promptly (Zeik & Anderson, 2015). It involves sharing project-related information to enhance understanding among stakeholders and ensure timely project delivery. The choice of communication medium, whether formal or informal, can significantly impact project outcomes. The study evaluated how project communication mediums contribute to the success of construction projects in North Central, Nigeria.

Literature Review

Project Communication Medium

Project communication refers to the effective and timely sharing of essential project details (Zeik & Anderson, 2015). It involves the exchange of information among project stakeholders, where a sender conveys information to a receiver through a chosen medium. This medium could be a formal report distributed via email, or an informal discussion during a team meeting, weekly progress updates, or a quick update on project milestones. Formal communication medium is an organized and planned approach of communication established in organization (Malik et al., 2021). In exchanging information, hierarchy of the organization must be adhered too as defined such as making use of e-mails or print release. In project, formal communication facilitates detailed record of information exchange among project stakeholders (Mbonigaba, 2022) while informal communication medium entails face- to-face interactions among people or workmates (Miclea & Irimiaş, 2023). This informal communication medium is often ad hoc and can be denied. The key takeaway is that successful project delivery hinges on clear and efficient communication through the right medium.

According to Nordin (2014), the choice of communication medium can either enhance or distort the intended message. It is crucial to select the appropriate medium to ensure effective communication. Rajhans (2012) also highlights that different communication mediums vary in their ability to convey information due to physical limitations that may restrict the type and volume of messages delivered. Factors such as the capacity to handle multiple information cues, enable quick feedback, and establish personal connections play a significant role in determining a medium's effectiveness for communication. Therefore, it is essential to match the richness of the information medium with the communication needs at hand.

Concept of Construction Project Success

Achieving success in a construction project involves completing tasks within the designated timeframe, budget, and performance standards (Stretton, 2023; Volden & Welde, 2022). This means finishing on schedule, within budget, meeting specifications, and ultimately reaching the project's business goals. Volden and Welde (2022) defined success as meeting technical specifications and mission objectives. Project success is tied to the effective performance of project indicators, including project managers. Traditionally, project success criteria are represented by the Iron Triangle of cost, time, and quality proposed by Atkinson (1999). However, recent studies (Dweiri, 2021; Rodrigues & Bowers, 1996) suggest that the Iron Triangle is not the only measure of success.

Contemporary measures of construction project success encompass a multi-dimensional approach introduced by studies (Hussain et al., 2022; Okuden et al., 2022). These factors include quality, cost, time, contract terms, and external influences. Key indicators of construction project success include: Project cost: Evaluating project performance in relation to its costs is crucial as resources are often limited, and cost overruns are common during construction. Project time: Timely completion is a significant factor in project performance, considering the challenges faced in construction projects. Project quality: Conformity to contract specifications is vital to measuring the quality of materials and workmanship. Project delivery ensures that the project is handed over to the client upon completion, making it an essential aspect of project success. Communication Theory, derived from Uncertainty Reduction Theory (URT), outlines how effective communication channels can reduce uncertainties in project execution. Berger and Calabrese (1975) emphasized the importance of choosing the right communication medium to facilitate information exchange within project groups. This approach can address uncertainties prevalent in project dynamics, fostering collaboration and partnerships based on shared goals for project success. Berger and Bradac (1982) further extended the theory to cover both ongoing and terminated project relationships, underscoring the significance of communication in project management.

Several studies have been conducted on project communication mediums and the success of construction projects. Abraham and Abdurazak (2019) explored project communication management and performance in water projects in Ethiopia, revealing the positive influence of communication methods and channels on project success. The study

highlighted oral communication as the most utilized method, emphasizing a bottom-up flow of information followed by horizontal information flow.

In another study, Kamikazi and Jaya (2017) investigated the impact of team communication on poverty reduction projects in Rwanda, specifically highlighting the influence of communication channels on the performance of the Rural Sector Support Project. Similarly, Ralph (2022) examined communication's impact on construction project delivery in Abuja, noting that face-to-face oral conversations were the most effective communication channel among professionals. Rezende et al., (2020) analyzed the influence of informal communication on the success of software development projects in Brazil. With the use of qualitative and descriptive approach, the study found a nexus between informal communication and project efficiency.

In the study of Nsefu et al., (2022) which assessed effective communication and project quality outcomes with both primary and secondary data and used sequential explanatory research design with regression analysis on data collected found that effective communication positively contributes to project success. On the other hand, the study of Yaser (2020) on the causes and effects of poor communication on projects, identifying lack of communication systems, improper channels, inadequate mediums, poor information management, and formal execution as significant factors. Conversely, Malik et al. (2021) studied the effects of communication and conflict on project success, noting that formal communication had a negative impact, while informal communication had a positive effect.

On the other hand, Guangdong et al. (2017) found a positive association between formal communication and project success, while informal communication had a negative impact on construction projects. Gbevade (2021) focused on communication among project team members in construction sites in Ghana, highlighting common communication channels such as meetings, telephone calls, face-to-face interactions, and drawings.

In a study by Kiradoo (2017) on effective communication between project managers and stakeholders, both formal and informal communication mediums were deemed crucial for project success. Behailu and Teklegiorgis (2021) explored the impact of communication on the success of Ethio telecom projects, emphasizing the positive influence of internal and external communication. Lastly, Musheke and Phiri (2021) examined the effects of effective communication on organizational performance, emphasizing that the channel of communication used by management did not significantly impact organizational performance.

Methodology

The study adopted a survey research design which made it possible for the study to have first-hand information about the research. To achieve the objective of the study, project managers were targeted as the population of the study because they were believed to have relevant information in this regard. The project managers involved in the study were those that were registered with the Real Estate Developers Association of Nigeria in Northcentral, Nigeria as at December 2023 which sum up to 385. To gather data, the study attempted to cover all project managers, however, only 344 responded adequately. The response rate was 89% and considered adequate for data analysis. Data was collected with a structured questionnaire which was reliable and validated before use. The Cronbach's alpha coefficient was more than 0.7. Field work lasted for three weeks and data collected were analysed statistically through inferential means. This was carried out through the software statistical package of SPSS.

Data Analysis and Interpretation

Respondents Personal Details Analysis

Four items were considered under respondents' personal details namely: gender, education, experience, and age group. The first item analysed captured the distribution of gender among the respondents and it was revealed that 256 (74.4%) of the respondents were male while 88(25.6%) were female. The gender distribution shows that the construction industry is male dominated. This suggests easy communication chances due to pronounced similarity in majority gender.

The distribution of respondents' years of experience reveals that 16(4.7%) respondents had 1-5 years' experience, 24(7%) respondents had 6-10 years' work experience, 105(30..5%) respondents had 11-15 years' experience, 170(49.4%) respondents had 16-20 years' experience while 29(8.4%) respondents had 21 year above experience. The distribution of years of experience within the sample population reveals a notable concentration of individuals with

moderate to extensive experience, particularly in the 16-20 years' experience range. This suggests that most participants in the study possess significant tenure within the construction industry in North-Central Nigeria, potentially indicating a wealth of practical knowledge and expertise.

Also, the distribution of respondents by educational qualification shows that 23(6.7%) respondents possess either national diploma or NCE, 163(47.4%) respondents had higher national diploma or 1st degree while 158(45.9%) respondents possessed 2nd degree. The distribution of education levels within the sample population reveals a notable predominance of individuals with HND/1st degree and 2nd degree. This suggests that most of the participants possess significant level of education to effectively communicate and appreciate the importance of communication in getting work done.

Lastly under this sub-heading is the age distribution of the respondents. From the 344 respondents, 9(2.6%) respondents were between 18-27 years of age, 32(9.3%) respondents were within 28-37 years of age, 191(55.5%) respondents were between 38-47 years of age, while 112(32.6%) respondents were 48 years and above. The distribution of respondents' ages indicates a notable concentration of active participants in the study. By implication, mature individuals were involved in the survey and perceived to have taken the study seriously making their views reliable.

Table 1 Respondents Profile

Items		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	256	74.4	74.4	74.4
	Female	88	25.6	25.6	100.0
	Total	**344**	**100.0**	**100.0**	
Expe	1-5	16	4.7	4.7	4.7
	6-10	24	7.0	7.0	11.7
	11 -15	105	30.5	30.5	42.2
	16-20	170	49.4	49.4	91.6
	21 and above	29	8.4	8.4	100.0
	Total	**344**	**100.0**	**100.0**	
Edu	OND/NCE	23	6.7	6.7	6.7
	HND/Bache	163	47.4	47.4	54.1
	2nd Degree	158	45.9	45.9	100.0
	Total	**344**	**100.0**	**100.0**	
Age Group	18-27	9	2.6	2.6	2.6
	28-37	32	9.3	9.3	11.9
	38- 47	191	55.5	55.5	67.4
	48 yrs & abv	112	32.6	32.6	100.0
	Total	**344**	**100.0**	**100.0**	

Source: Computed Data, 2024

Test of Hypotheses

$H0_1$: Formal communication medium does not influence construction project success in Nigeria

Table 2: Model Summary of formal communication medium and CPS

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.145[a]	.021	.018	.546	.021	7.374	1	342	.007

a. Predictors: (Constant), Formal communication medium

Source: Computed Data, 2024

The model summarised in Table 2 shows how much of the variance of construction project success is explained by formal communication medium. In this case, the R square is .021 if expressed by a percentage will be 21%. This implies that the model explains 21% of the variance in construction project success.

Table 3: ANOVA[a] of formal communication medium and CPS

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.202	1	2.202	7.374	.007[b]
	Residual	102.124	342	.299		
	Total	104.326	343			

a. Dependent Variable: CPS

b. Predictor: (Constant), Formal Communication Medium

Source: Computed Data, 2024

Table 3 shows the ANOVA assessment of the statistical significance (0.007). The F-value for the model was obtained by dividing the regression mean square (2.202) by the residual mean square (.229). The F-value for the model is equal to 7.374

Table 4: Coefficients[a] of formal communication medium and CPS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.286	.265		19.913	.000
	Formal Comm Medium	-.160	.059	-.145	-2.715	.007

a. Dependent Variable: CPS

Source: Computed Data, 2024

Table 4 described formal communication medium as a statistically significant variable with exclusive contribution to the model obtainable under the sig column in the Table. It reveals the strength of the contribution of the independent variable (formal communication medium) to the dependent variable (construction project success). The Table revealed that formal communication medium made (0.007) contributions to the model.

Decision: Hence, the null hypothesis (H_o) was rejected while the alternate hypothesis (H_1) is accepted. By implication, formal communication medium influences construction project success in Nigeria.

Ho_2: Informal communication medium does not determine construction project success in Nigeria

Table 5: Model Summary of Informal Communication Medium and CPS

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.010[a]	.000	-.003	.552	.000	.034	1	342	.853

a. Predictors: (Constant), Informal Communication Medium

Source: Computed Data, 2024

To explore the effect of informal communication medium on CPS, regression model was applied. The model summary of Table 5 shows how much of the variance of CPS is explained by informal communication medium. In this case, the

R square is .000. This means that the model explains to effect.

Table 6: ANOVA[a] of Informal Communication Medium and CPS

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.010	1	.010	.034	.853[b]
	Residual	104.315	342	.305		
	Total	104.326	343			

a. Dependent Variable: CPS

b. Predictors: (Constant), Informal Communication Medium

Source: Computed Data, 2024

As presented in Table 6 the ANOVA Table shows the assessment of the statistical significance (0.853). The F-value for the model was obtained by dividing the regression mean square (.010) by the residual mean square (.305). The F-value for the model is equal to .034

Table 7: Coefficients[a] of Informal Communication Medium and CPS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.617	.255		18.077	.000
	Informal Comm	-.010	.056	-.010	-.185	.853

a. Dependent Variable: CPS

Source: Computed Data, 2024

Table 7 described that informal communication medium significantly contribute to the model obtainable under the sig column in the Table. It reveals the strength of the contribution of the independent variable (informal communication medium) to the dependent variable (construction project success). The Table revealed that informal communication medium (0.853) made significant contribution to the model.

Decision: Hence, the null hypothesis (H_o) was rejected while the alternate hypothesis (H_1) is accepted. By implication, informal communication medium determines construction project success.

Discussion

This study has clearly revealed that the respondents possessed the profile to have participated in the research. This was determined through their age, gender, experience and educational qualification. Precisely, their feedbacks have been used to generate results used for the analysis. From the inferential analyses conducted, it was revealed that communication medium is impactful on project success. Firstly, it was found that formal communication medium influences construction project success in Nigeria. This finding suggests that formal communication has contributed massively to the numbers of successfully completed projects that are seen around. This finding corroborates the position of Guangdong et al. (2017) which found a positive association between formal communication and project success. However, the finding contradicts the outcome of the study of Malik et al. (2021) which found that formal communication had a negative impact. Thus, it is remarkable to know that the issue of formal communication medium is not absolute determinant of project success as there are determinants of project success like informal communication medium and the likes.

Secondly, informal communication medium is found to be significant to construction project success. This finding suggests that informal communication medium determines construction project success implying that some level of informal passage of information is to be required at times among project stakeholders otherwise, project might suffer. This finding is not different from the position of Rezende et al., (2020) which found that there is a relationship

between informal communication and project efficiency. Furthermore, this study corroborates the finding from the study of Malik et al. (2021) which established that informal communication positively determine project success. However, the study of disagree with the finding of Guangdong et al. (2017) which found a negative association between informal communication and construction projects performance.

Conclusion

It is remarkable to note that there is no human known activities that will be achieved without effective communication. Project success is no exception as this study clearly revealed that in construction industry effective communication is important. This is achievable using appropriate communication medium. The study identified both formal and informal medium as what can be jointly used by project stakeholders to achieve project. Although the study appreciated the place of formal communication ahead of the informal communication because of documentation and what project execution of turned out to be in modern construction world for project tracking and assessment purposes. However, informal communication has been established to be important in building work relationship at sites to facilitate collaboration and social cohesion at work sites. Therefore, both formal and informal communication medium are germane however, formal communication should be pronounced for record purpose as well as for checks and validation of claims that can lead to conflict.

Recommendations

Based on the findings and discussion, the following recommendations were suggested:

1. Formal communication medium is important and should be encouraged throughout the phases of project life. This will assist in keeping records and for tracking performance of all the stakeholders involved in the project. There should proper guidelines to state issues to be formalized when communication in project life.
2. It is not out of place to encourage some form of informal communication because human beings need to socialize and build cohesion as they work together at time. However, management needs to properly define information exchange that comes under informal communication to prevent conflict.
3. A blend of both formal and informal communication should be encouraged at work sites so that workers can related harmoniously and not cause unnecessary bottleneck in project life.

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