

FACTORS AFFECTING THE EFFECTIVENESS OF POST-MORTEM REVIEWS IN TETFUND BUILDING CONSTRUCTION PROJECTS IN EKITI STATE, NIGERIA

Adebayo, B. O., Awodele, O. A., and Oke, A. E



DOI10.51459/jostir.2026.2.2.0200

¹Department of Quantity Surveying, Federal University, Oye-Ekiti

^{2,3}Department of Quantity Surveying, Federal University of Technology, Akure

Correspondence

bosedade.adebayo@fuoye.edu.ng

History

Received: 26-12-2025

Accepted: 06-07-2026

Published: August, 2026

ABSTRACT

This study investigated the factors affecting effective implementation of Post-Mortem Review (PMR) in TETFund construction projects. PMR was recognized as a method for learning from completed projects and improving future project performance. However, its implementation in TETFund projects remains limited due to several factors. The study adopted a quantitative research approach using a questionnaire, which was sent to the 197 professionals selected by census method who worked on completed TETFund projects in the five tertiary institutions in Ekiti State, Nigeria, of which 186 questionnaires were retrieved and fit for analysis. Analysis was done with the use of frequency, Mean Score (MS), ANOVA, and Exploratory Factor Analysis (EFA). Results showed that misconceptions of PMR (MS = 4.50), limited stakeholder participation (MS = 4.43), and budget restrictions (MS = 4.32) were ranked as the most severe factors. The results from ANOVA showed broad consensus among stakeholders on the factors, as there were no statistically significant differences in factor ratings across professional groups ($p > 0.05$). Cronbach's alpha was 0.94, confirming excellent reliability, and EFA was performed with Varimax rotation (KMO = 0.883, Bartlett's test $p = 0.000$), revealing four underlying components that explained 72.93% of the total variance, thereby grouping the 20 factors into four latent constructs: human, organisational, resource, and process. The findings highlighted the interconnected nature of factors affecting PMR and explained how they collectively impact its effectiveness. The study recommends that TETFund/beneficiary institutions should create more awareness of PMR practices to reduce misconceptions and make concerted efforts to tackle all other multidimensional factors.

Keywords: Post-Mortem Review, TETFund, Construction Projects, Project Performance, Lessons Learned, Multidimensional Factors

1. | Introduction

Among various sectors of the economy, such as Information Technology (IT), aviation, and healthcare, PMRs have proven to be highly beneficial in helping organisations better understand and manage their daily risks (Nash, 2000; Oruko *et al.*, 2020; Mehvish *et al.*, 2019). PMRs support continuous

improvement by identifying the main causes of performance gaps, setting development goals, and disseminating information at all organisational levels (Maluleke and Marnewick, 2012). However, construction projects rarely conduct or standardize PMRs when the projects are completed (Oyewobi *et al.*, 2019). While PMR has been studied in other sectors and even



<https://www.futa.edu.ng>



<https://jostir.futa.edu.ng>

across construction sectors, there is limited empirical evidence on the factors affecting its effective implementation in construction projects and publicly funded tertiary education infrastructure projects in Nigeria, particularly using integrated ranking and factor analysis. Inconsistent conduct of PMR has made it proven difficult for construction sectors to solve persistent construction project issues (Oyewobi *et al.*, 2019; Ariyo and Awodele, 2015), and this is also applicable to building projects sponsored by the Tertiary Education Trust Fund (TETFund).

TETFund was established in 2011 with the goal of enhancing the quality of education in Nigeria's public tertiary education system by providing funding for specific initiatives such as infrastructural facilities and research (TETFund, 2023). TETFund has been widely known to be instrumental in the infrastructural development and upgrading of tertiary institutions in Nigeria, but the construction projects sponsored by the Fund often encounter issues like delays, poor quality, and cost overruns despite the huge investments made (Adebayo *et al.*, 2025; Ojo, 2021; Aghimien *et al.*, 2019). Although these problems are common in many developing countries, they are exacerbated in Nigeria by systemic issues such as poor risk management, lack of standardized PMRs, corruption, and inadequate stakeholder engagement (Nnadi *et al.*, 2024; Oyewobi *et al.*, 2019). Accordingly, there is a need to evaluate the limiting factors in carrying out PMR to integrate organisational learning into the process and enhance subsequent project initiatives (Williams *et al.*, 2022). Despite the global recognition of PMRs as a tool for enhancing construction project outcomes and as a tool for blameless review in IT and manufacturing sectors, their adoption in Nigeria is hindered by a series of factors and challenges (McClory *et al.*, 2017). The need for the study stems from persistent issues in TETFund projects despite substantial investments, highlighting the need for effective organisational learning mechanisms (Ojo, 2021; Aghimien *et al.*, 2019).

Previous studies have investigated the general project performance challenges in Nigerian construction and the benefits of PMR in sectors such as IT and healthcare (Ariyo & Awodele, 2015; Unegbu *et al.*, 2023; Solomon *et al.*, 2025). However, there remains limited empirical investigation into the specific factors hindering PMR implementation in TETFund-funded projects, particularly using multivariate techniques such as exploratory factor analysis to uncover latent constructs. This gap justifies the need for the present study in Ekiti State. This study addressed this gap by combining the factors' severity ranking with Exploratory Factor Analysis (EFA) on data from 186 professionals directly involved in TETFund projects. Therefore, this study aims to investigate the factors affecting the effectiveness of post-mortem reviews in TETFund building construction projects in Ekiti State, Nigeria, a region with tertiary institutions that are major beneficiaries of TETFund support in their infrastructural growth with a view to identify and rank the factors, examine differences in perception about the factors across professional groups, and determine the underlying latent constructs of the identified factors.

1.1 | Post-Mortem Review in Context

The construction sector is known to be a vital component of economic growth, but the sector is known to be complex in nature. TETFund building construction projects particularly experience various degrees of issues ranging from poor quality, delays, and cost overruns (Zou *et al.*, 2007; Aigbavboa *et al.*, 2016; Nwafor, 2024) due to their complex nature. Mitigating methods and strategies are needed to be employed to reduce these errors and make the construction processes more predictable (Aven, 2016; Bahamid *et al.*, 2022). PMR, also referred to as lessons learned, after-action review, project retrospectives, or post-project evaluation in literature (CII, 2019; Kerzner, 2025), provides a systematic method for evaluating a construction project's performance based on criteria such as adherence

to quality standards, meeting the project timeline, keeping the project within the initial budget, and ensuring stakeholder satisfaction. PMRs have a great deal of potential to improve projects, as they help in promoting organisational learning and sharing of valuable insights (Anumba *et al.*, 2005). They are of less importance to construction professionals, though, because their application in the construction sector is not standardized (Carrillo *et al.*, 2011; Kerzner, 2025), particularly in TETFund building projects. The absence of a structured PMRs framework increases the likelihood of project failures in Ekiti State tertiary institutions. This necessitates the need to assess the factors that hinder the implementation of PMR on their completed building projects.

1.2 | Theoretical Framework for Post-Mortem Review

The study of PMR is underpinned by Kolb's Experiential Learning Theory (ELT), which provides insightful analysis for PMR of TETFund projects in Nigeria. ELT sees learning as the process of acquiring knowledge by means of experience's transformation (Kolb, 2014). ELT offers a cyclical paradigm whereby experience forms the basis of learning; people move between the concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb & Kolb, 2012). The teams collect data from completed TETFund projects (Concrete Experience), reflect on and discuss the outcomes (Reflective Observation), analyze these reflections to derive key lessons and underlying principles (Abstract Conceptualisation), and then apply these insights to future projects by means of actionable improvements (Active Experimentation), which invariably helps in promoting continuous improvement, but all these insightful processes are hindered by some limiting factors. The study is also grounded in Organisational Learning Theory (OLT), which helps explain how organisations detect and correct errors (Argyris & Schon, 1978; Curado, 2006). These are construction-specific

knowledge management concepts that highlight practical barriers such as time pressure, fragmented teams, poor documentation, and organisational culture that hinder effective learning from projects (Maqsood, 2024). All these theories emphasise the systematic capture and application of lessons from past experiences to improve future performance and explain how PMR facilitates single-loop and double-loop learning but is hindered by human, organisational, resource, and process factors in the Nigerian context.

1.3 | Factors Affecting PMR Best Practices

There are significant factors that affect the successful systematic evaluation and knowledge-management processes that are necessary to improve project delivery and outcomes in TETFund building projects and the Nigerian construction industry. A review of literature reveals consistent patterns of factors across studies, although contradictions exist regarding the relative importance of resource versus cultural factors. Organisational, cultural, and resource-related obstacles impede reviews (Love *et al.*, 2016; Dekker, 2012). These factors are grouped thematically in this study under human, organisational, resource, and process dimensions, providing a conceptual framework grounded in organisational learning theory. It is always challenging to obtain relevant feedback and important information about “what went well and what went wrong” during the project construction process due to bureaucratic systems, corruption, and a lack of standard operating procedures, as well as sociocultural problems like professionals' reluctance to discuss failures in a hierarchical manner (Wapmuk and Amini, 2018; Ojo, 2021; Sayed, 2023). The quality of PMR is further diminished by inadequate funding, unqualified facilitators, inadequate stakeholder participation, and poor construction data quality (Hwang *et al.*, 2014; Jimoh *et al.*, 2016; Oyewobi *et al.*, 2019).

The timing of conducting PMRs also matters a great deal, as when these reviews are carried out halfway through a project, especially after key milestones have been reached, they deliver far more up-to-date and useful insights than those done only at the very end (Kerzner, 2025). However, mid-project reviews tend to be costly and can seriously disrupt ongoing construction work. A lot of problems hampered the proper use of PMRs in the Nigerian construction industry. Factors like weak organisational structure, widespread corruption, and scarce resources all tend to hinder the process of setting clear objectives, maintaining transparency, and putting the review recommendations into practice (Enshassi *et al.*, 2014; Jimoh *et al.*, 2016; Carrillo, 2005). In view of this, the focus on lowest-cost bidding, reluctance to adopt new innovative practices, and the ego of some senior professionals often prevent transparent discussions during these PMR meetings (Carrillo, 2005; Oyewobi *et al.*, 2019; Ariyo & Awodele, 2015). In addition, the absence of real incentives and standardized procedures continues to limit the value of PMR in the Nigerian construction sector (Oyewobi *et al.*, 2019; Ariyo & Awodele, 2015). Also, limited stakeholder participation, insufficient knowledge, and limited awareness of PMRs lead to superficial PMRs, while the desire to avoid blame and communication gaps diminish their effectiveness (Oyewobi *et al.*, 2019; Jimoh *et al.*, 2016; Molwus, 2014).

1.4 | Research Hypothesis

H_{01} : There is no significant difference in the mean ratings of PMR limiting factors among different built-environment professionals involved in TETFund projects.

2. | Material and Methods

A survey-based quantitative research design was used for this study to evaluate factors impacting the effectiveness of PMRs in TETFund building

projects in Ekiti State, Nigeria. Twenty (20) factors initially identified from literature review were refined through preliminary survey with experts and were considered for use in this study. Content validity was established through expert validation by a panel of five construction professionals. Ekiti State, also known as “Fountain of Knowledge,” was selected because it hosts five major tertiary institutions that are significant beneficiaries of TETFund infrastructure funding. The state provides a representative microcosm of challenges faced in publicly funded projects across Nigeria’s tertiary education sector while allowing for manageable census coverage of relevant professionals. A positivist research philosophy was adopted, as this aligns with the quantitative survey design, use of structured questionnaires, and statistical analysis to objectively measure and generalise factors affecting PMR effectiveness. This philosophical approach enables objective testing of relationships and generalisation within the professionals in the institutions.

A preliminary survey conducted identified one hundred and ninety-seven (197) professionals from works, physical planning, and procurement units, as well as consultants and contractors (outsourced) involved in completed TETFund projects across five tertiary institutions in Ekiti State between 2022 and 2024. This 3-year timeline ensured that the insights from the recent projects are still fresh in the minds of the professionals. A census approach was employed to select respondents because the target population of 197 professionals across the five institutions was small and fully identifiable. This ensured comprehensive coverage and eliminated sampling error. The institutions selected for this study are Federal University, Oye-Ekiti; Ekiti State University, Ado-Ekiti; Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti; Federal Polytechnic, Ado-Ekiti; and Ekiti State Polytechnic, Isan-Ekiti, which are a combination of both universities and polytechnics in Ekiti State.

The questionnaire, which included two parts, one

about the respondents' characteristics and the other about the study's objectives, was sent out electronically using Google forms. One hundred and eighty-six (186) out of one hundred and ninety-seven (197) questionnaire responses were found suitable for analysis due to incomplete information from some respondents on the questionnaires giving a response rate of 94.4%. This high rate is attributed to the census approach, electronic distribution with follow-ups, and the relevance of the topic to the respondents' daily professional responsibilities. It exceeds typical survey response rates in construction research and enhances the reliability of findings. Inferential statistics like ANOVA and Cronbach's alpha coefficient were used for analysis in addition to the descriptive tools like frequency and mean score. Cronbach's alpha was used to assess the internal consistency and reliability of the measurement scale. One-way ANOVA was employed to test for significant differences in factors' perceptions across professional groups. Exploratory Factor Analysis (EFA) using Principal Component Analysis with Varimax rotation was performed to identify underlying latent constructs among the 20 factors.

3. | Results

3.1 | Characteristics of respondents to the questionnaire

Table 1 showed the characteristics of the professionals that responded to the questionnaires. 55.9% of respondents were from government agencies, followed by consulting firms (36.6%) and construction companies (7.5%). This distribution reflects the significant involvement of diverse stakeholders in the management and oversight of TETFund projects. In terms of professions, quantity surveyors accounted for 25.8%, structural engineers 23.2%, electrical engineers 18.8%, architects 17.7%, and mechanical engineers 14.5%. This demonstrates the involvement of professionals from a wide range of fields in the built environment. The majority (65.6%) hold master's degrees (M.Tech/MSc), and 30.6% hold bachelor's degrees. The respondents were highly experienced and well-qualified professionals directly involved in TETFund projects. Also, the experience levels are high and guarantee

Table 1 | Characteristics of Respondents to the Questionnaire

Characteristics	Item	Frequency	Percent %
Type of Organization	Construction Company	14	7.5
	Consulting Firm	68	36.6
	Government Establishment	104	55.9
	Total	186	100
Profession of the respondent	Architecture	33	17.7
	Electrical/Mechanical Engineering	62	33.3
	Quantity Surveying	48	25.8
	Building/Structural Engineer	43	23.2
	Total	186	100
Qualification of the respondents	HND	3	1.6
	B.Tech/BSc	57	30.6
	M.Tech/MSc	122	65.6
	PhD	4	2.2
	Total	186	100
Years of Experience	1 - 5 years	6	3.2
	6 - 10 years	31	16.7

Characteristics	Item	Frequency	Percent %
	11 - 15 years	76	40.9
	16 - 20 years	62	33.3
	Above 20 years	11	5.9
	Total	186	100
No of TETFund building projects handled	4 and above	33	17.6
	6 and above	44	23.7
	8 and above	27	14.5
	10 and above	28	15.1
	12 and above	13	7.0
	14 and above	5	2.7
	16 and above	36	19.4
	Total	186	100

Source | Authors' work

knowledgeable viewpoints on PMR, with 40.9% having 11–15 years of experience and 33.3% having 16–20 years.

The reliability statistics presented in Table 2 indicate a Cronbach's alpha value of 0.94 for the 20 factor items used in the study. This high coefficient suggests

excellent internal consistency and high reliability of the instrument, suggesting that the 20 barrier items consistently measured the underlying construct.

Table 3 shows findings from the analysis of factors impeding effective implementation of PMR. From the table, the most critical challenges are rooted in

Table 2 | Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
0.94	0.941	20

Source | Authors' work

misconceptions and systemic issues about PMR. In the overall opinion of the stakeholders (architects, quantity surveyors, builders, and engineers), misconceptions of PMR by construction teams recorded the highest overall mean score (MS = 4.50), limited stakeholder participation (MS = 4.43), and budget constraints (MS = 4.32) as the primary factors affecting the effective PMR implementation in TETFund building construction projects. Poor organizational structure (MS = 4.17) further hampers innovation and learning. Procedural issues like poor data maintenance (MS = 4.02) and

reluctance to avoid blame (MS = 3.97) also tend to reduce PMR effectiveness. While the client's unwillingness to bear the cost of new methods (MS = 3.26) and time delays in conducting PMR (MS = 3.03) are less critical, inadequate awareness (MS = 2.78) is the least significant factor, indicating that misconceptions and systemic issues, rather than lack of knowledge, primarily impede PMR adoption. The p-values for all factors were greater than 0.05, indicating that the differences in mean ratings across professions are not statistically significant at the 5% significance level. The non-significant F-statistics (p

> 0.05) indicate broad agreement among professional groups; hence, the null hypothesis that there is no significant difference in the mean ratings of PMR limiting factors among different built-environment

professionals involved in TETFund projects is not rejected.

Table 3 | Mean Ratings, Ranking, and One-Way ANOVA Results of Factors Limiting Post-Mortem Review (PMR) in TETFund Projects

Factors	Architects	Quantity Surveyors	Engineers	Builders	Overall Mean	Rank	F-stat	P value
Misconceptions of PMR by construction teams	4.40	4.36	4.61	4.50	4.50	1	1.12	0.34
Limited stakeholder participation	4.35	4.38	4.49	4.50	4.43	2	0.78	0.51
Budget restrictions and lack of funds	4.20	4.31	4.42	4.35	4.32	3	0.93	0.44
Poor organizational structure	4.10	4.26	3.91	4.50	4.17	4	1.05	0.37
Shortage of project management experts	4.01	4.12	4.22	4.20	4.14	5	0.68	0.56
Poor management practices	4.00	4.06	4.03	4.15	4.06	6	0.85	0.47
Procurement patterns that hinder innovation	3.98	4.10	4.06	4.03	4.04	7	0.71	0.55
Poor data maintenance during project	3.95	4.05	4.10	3.98	4.02	8	0.56	0.65
Ego and pride of team members	3.86	3.96	4.06	4.14	4.01	9	0.42	0.74
Reluctance to avoid blame	3.91	3.93	4.03	3.96	3.97	10	0.12	0.95
Inadequate time for reviews	3.88	3.97	4.02	3.96	3.96	11	0.38	0.77
Professionals' inability to reflect on past	3.95	3.96	3.78	4.18	3.95	12	0.28	0.56
Corruption within the construction industry	3.89	3.91	3.94	3.99	3.93	13	0.34	0.79
Lack of interim reviews for reference	3.52	3.85	4.06	3.95	3.88	14	1.52	0.22
Lack of resources to act on review outcomes	4.00	4.04	3.53	3.91	3.84	15	2.25	0.09
Incompetence in carrying out reviews	4.01	3.82	3.75	3.59	3.78	16	0.88	0.46
Communication gap between client and consultants	3.43	3.78	3.63	3.73	3.65	17	0.70	0.55
Client's unwillingness to bear cost of new methods	3.30	3.19	3.25	3.30	3.26	18	0.62	0.61
Time delays in conducting PMR	3.14	3.07	2.94	3.00	3.03	19	0.23	0.87
Inadequate awareness of PMR among professionals	2.80	2.76	2.74	2.82	2.78	20	0.31	0.82

Table 4 depicted the results of the Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy for the data. These two tests are important to determining whether the datasets are suitable for factor analysis. The KMO result of 0.883, as shown in the table, is significantly higher than the 0.6 minimum allowed value. This high value also corroborates that the sample size and correlations between the 20 factors are sufficient for

factor extraction. This showed that there is enough shared variance among the variables for Exploratory Factor Analysis (EFA) to be useful. The Bartlett's Test of Sphericity result showed significance at the 0.05 level with 190 degrees of freedom (df), a p-value of 0.000, and a chi-square value of 3729.621. The 0.05 level of significance shows that the items are sufficiently related to one another and not independent of one another.

Table 4 | KMO and Bartlett’s Tests of Factors Affecting PMR

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.883
Bartlett's Test of Sphericity	Approx. Chi-Square	3729.621
	df	190
	P-value	0.000

Source | Authors’ work

Table 5 shows the results of the total variance explained with the initial eigenvalues and the rotation sums of squared loadings for the 20 items that are factors impeding the successful implementation of PMR in TETFund building projects. The first component had an eigenvalue of 11.143 and explained 53.06% of the total variance. The second, third, and fourth components explained 8.60%, 6.03%, and 5.24%, respectively. Before rotation, these four parts together accounted for 72.93% of the overall variation. This suggests that a major part of the data variability can be found in these major underlying elements.

After running the Varimax rotation, the variance no longer piled up heavily on the first factor. Instead, it spread out in a way that improved the results. The strongest component ended up carrying 33.13% of the total variance, while the second component took 22.79%, the third component contributed 11.21%, and the fourth component added another 5.81%, all culminating in a total of 72.93%, a very solid percentage of the variance. All these factors underscore the complexity of PMR implementation, where both systemic and interpersonal dynamics

interact to shape the completed TETFund project outcomes. The result became more balanced after the varimax rotation, as the first components stopped hogging most of the variance, and the other components also displayed their level of importance. The analysis showed that the factors affecting PMR implementation are multidimensional and yet clearly connected, all displaying their distinct role at a time. The first two components that displayed substantial variance showed their strong influence on PMR implementation outcomes.

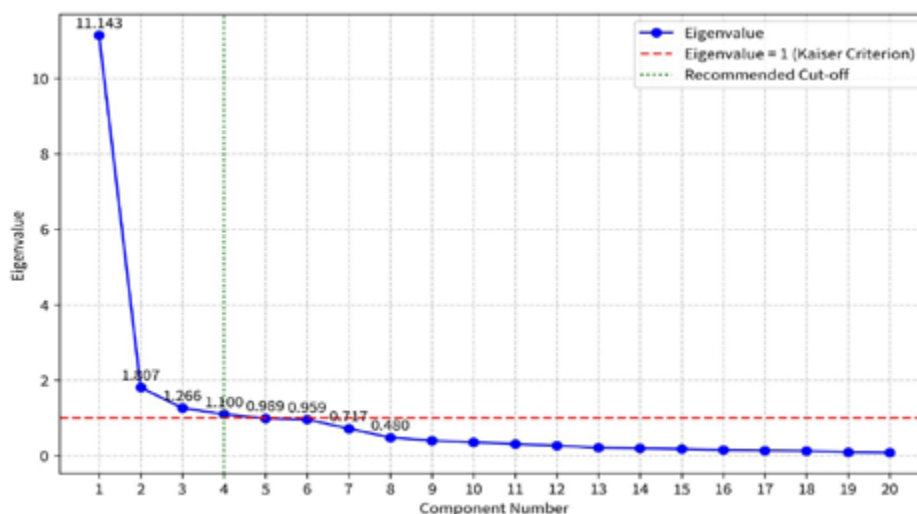
The scree plot presented in Figure 1 shows the distribution of eigenvalues for the 20 components extracted during the factor analysis. The plot illustrates a steep decline from the first to the second component, followed by a gradual leveling off from the third component onward. This pattern indicates that the first few components account for the majority of the variance in the dataset, while subsequent components contribute only marginally. The sharp drop between the first and second components suggests that the data structure is dominated by a few strong underlying factors. According to the Kaiser criterion (eigenvalue > 1) and the visual inspection

Table 5 | Total Variance Explained by Components in the Analysis of Factors Limiting Post-Mortem Review (PMR) Effectiveness

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Var.	Cum%	Total	% of Var.	Cum %
1	11.143	53.061	53.061	6.957	33.13	33.13
2	1.807	8.604	61.666	4.785	22.788	55.917
3	1.266	6.026	67.692	2.354	11.209	67.126
4	1.1	5.24	72.932	1.219	5.805	72.932
5	0.989	4.709	77.641			
6	0.959	4.564	82.205			
7	0.717	3.413	85.618			
8	0.48	2.284	87.903			
9	0.399	1.902	89.805			
10	0.354	1.686	91.491			
11	0.308	1.469	92.96			
12	0.266	1.268	94.228			
13	0.209	0.994	95.223			
14	0.192	0.914	96.137			
15	0.178	0.85	96.987			
16	0.148	0.704	97.69			
17	0.135	0.642	98.333			
18	0.127	0.604	98.936			
19	0.093	0.441	99.377			
20	0.08	0.623	100			

of the scree plot, four components were retained for further interpretation. The scree plot shows a very sharp drop after Component 1, followed by a noticeable flattening (elbow) after Component 4. This

visual evidence strongly supports the retention of four components, which collectively explain 72.93% of the total variance in the barriers to effective post-mortem reviews.



The results of the rotated component matrix, generated by rotating the four retrieved components using the varimax method, were depicted in Table 6. The varimax rotation method revealed more relationships that exist between the various factors and their constituent parts, and it also showed more even distribution of variance across the factors. The analysis on the table evidently displayed that the 20 factors can be divided into four major categories, each of which stands for a distinct kind of factor that makes inculcating PMR in TETFund construction projects more difficult. Factors 7 (team members' pride and egos), 8 (limited stakeholder participation), 9 (incompetence in conducting reviews), 10 (lack

of project management experts), 12 (reluctance to avoid blame), 13 (professionals' incapacity to reflect on past experiences), 15 (construction professionals' misconceptions of PMR), and 16 (lack of interim reviews for reference) were all heavily loaded in the first section. The loadings ranged from 0.65 to 0.80. This part can be seen as the human components, which are attitudes that professionals have toward each other and their work that make it difficult for project teams to work together, learn, and be responsible. The factors showed how crucial the underlying human issues are to the success or failure of PMR projects.

Table 6 | Rotated Component Matrix of Factors Affecting PMR Implementation

Codes	Items	Human	Organisational	Resource	Process
Factor1	Poor organizational structure	0.400	0.636	0.322	0.136
Factor2	Corruption within the construction industry	-0.029	0.825	0.368	0.051
Factor3	Lack of resources to act on review outcomes	0.568	0.441	0.794	-0.211
Factor4	Budget restrictions and lack of funds	0.482	0.497	0.683	-0.204
Factor5	Procurement patterns that hinder innovation	0.585	0.331	0.427	0.658
Factor6	Client's unwillingness to bear costs	-0.142	0.399	0.695	0.445
Factor7	Ego and pride of team members	0.649	0.228	0.235	0.000
Factor8	Limited stakeholder participation	0.788	0.197	-0.245	0.174
Factor9	Incompetence in carrying out reviews	0.762	0.321	-0.113	0.111
Factor10	Shortage of project management experts	0.836	0.367	-0.128	0.149
Factor11	Inadequate time for reviews	0.442	0.733	0.179	0.003
Factor12	Reluctance to avoid blame	0.771	0.286	0.298	0.254
Factor13	Professionals' inability to reflect on past experiences	0.804	0.383	0.053	0.099
Factor14	Communication gap between client and consultants	0.466	0.619	-0.023	0.293
Factor15	Misconceptions of PMR by construction professionals	0.770	0.473	0.258	0.021
Factor16	Lack of interim reviews for reference	0.549	0.471	0.290	-0.008
Factor17	Poor data maintenance during project progress	0.524	0.725	0.386	0.034
Factor18	Inadequate time for reviews	0.479	0.763	0.179	0.003
Factor19	Time delays in conducting PMR	0.320	0.321	-0.100	0.002
Factor20	Poor management practices	0.240	0.852	-0.241	0.122

Source | Authors' work

The second component had high loadings on the following factors: Factor 1 (poor organizational structure), factor 2 (corruption within the Nigerian construction industry), factor 11 (inadequate time for reviews), factor 14 (communication gap between client and consultants), factor 17 (poor data maintenance during project progress), factor 18 (inadequate time for reviews), factor 19 (time delays in conducting PMR), and factor 20 (poor management practices). This element stands for the organisational components, which include structural problems, communication problems, and management problems that get in the way of the PMR process. The fact that there are both

time-related and procedural problems shows that bad coordination between organizations is still a big problem for TETFund projects to carry out and evaluate. The third part, which has a heavy loading on factor 3 (lack of resources to act on review conclusions), factor 4 (budget restrictions and lack of funds), and factor 6 (client’s unwillingness to bear costs), represents factors relating to the resource’s component. The fourth component was mostly made up of factor 5 (procurement patterns that hinder innovation), which had a load of 0.65. This shows a process component that indicated problems with procurement that hurt the credibility and long-term success of PMR projects.

Table 7 | Summary of the Rotated Component Matrix (Varimax Rotation)

Components	Barriers	Theme	Interpretation
1	Factor 7, Factor 8, Factor 9, Factor 10, Factor 12, Factor 13, Factor 15, Factor 16	Human Component	Represents attitudinal and interpersonal constraints such as ego, blame avoidance, incompetence, and limited stakeholder participation that hinder effective collaboration during PMR.
2	Factor 1, Factor 2, Factor 11, Factor 14, Factor 17, Factor 18, Factor 19, Factor 20	Organizational Component	Captures issues of weak coordination and data management lapses that reduce PMR efficiency.
3	Factor 3, Factor 4, Factor 6	Resources Component	Highlights resource-related weaknesses, such as inadequate funding affecting PMR implementation.
4	Factor 5	Process Component	Represents the effectiveness of PMR as a process influenced by other underlying procurement issues.

Source | Authors’ work

Table 7 shows the summary of the rotated component matrix revealing that factors affecting PMR are multifaceted, with four distinct underlying dimensions. The dominant human component reflects attitudinal and interpersonal obstacles, such as ego, blame avoidance, perceived incompetence, and restricted stakeholder involvement, that undermine collaboration and openness during reviews. Closely

related is the organisational component, which captures weaknesses in coordination, information sharing, and data management that diminish overall PMR efficiency. The resources component highlights systemic constraints, including inadequate funding, which limit the implementation of review processes. Finally, the process component indicates that the effectiveness of PMR is strongly shaped by broader

procurement and project management deficiencies. All these findings demonstrate that PMR challenges stem primarily from behavioural, structural, and resource-related issues rather than purely procedural ones, underscoring the need for holistic interventions targeting people, organizational practices, and resource support.

3. | Discussion

The main outcomes of this research study pointed out the main factors affecting the effective implementation of PMR in TETFund building construction projects in Nigerian tertiary institutions in Ekiti State. The study found the complex implementation process by an analysis of questionnaire responses from one hundred and eighty-six (186) stakeholders who had participated in completed TETFund building projects, which revealed that the factors affecting PMR adoption are not only structural but also human and resource-based. It was evident that the factors affecting PMR process for completed TETFund projects are multidimensional. The top factors from the findings were misconceptions of PMR by construction teams (mean = 4.50), limited stakeholder participation (4.43), and budget restrictions/lack of funds (4.32). Exploratory Factor Analysis (EFA) with high reliability (Cronbach's $\alpha = 0.94$) and good sampling adequacy (KMO = 0.883) identified four underlying components explaining 72.93% of variance: Human (e.g., ego, blame avoidance, incompetence), Organisational (e.g., poor structure, data maintenance, management practices), Resource (e.g., funding, acting on outcomes), and Process (e.g., procurement issues). These factors are consistent with Nigerian and developing-country literature on public project failures, where corruption, bureaucratic bottlenecks, resource constraints, poor documentation, weak governance systems, and cultural issues such as blame culture and poor accountability dominate (Ameh & Oshodi, 2018; Wakwe *et al.*, 2025; Lan *et al.*, 2026).

The study noted that human and organisational components are the main factors impeding the successful implementation of PMRs in TETFund building projects. This is in line with previous studies on construction project challenges (Love *et al.*, 2018; CII, 2019; Umar, 2025). The dominance of human barriers can be attributed to the adversarial culture prevalent in the Nigerian construction industry, where professionals are often reluctant to discuss failures openly due to fear of blame. Organisational components are strong in TETFund due to bureaucracy/funding cycles. The rate of adoption of PMR is also severely hampered by procedural inefficiencies, such as delayed or absent interim reviews, as well as a cultural reluctance by stakeholders to publicly address the issues. In line with more general findings on poor project performance in Nigeria linked to inadequate funding and stakeholder engagement (Nnadi *et al.*, 2024; Oyewobi *et al.*, 2019), the analysis also showed that among the most pressing issues are misconceptions regarding PMR values, low stakeholder participation, and inadequate budget allocations from TETFund. Misconceptions dominate due to adversarial culture and lack of prior exposure. This agreed with findings from other PMR studies that project knowledge is not reliable due to cognitive biases and misunderstandings (Carrillo *et al.*, 2011; Anbari *et al.*, 2008). In Nigerian construction projects, these misunderstandings may arise from a conventional adversarial project culture, as indicated in research on building conflicts (Onifade, 2016; Daboun *et al.*, 2023; Adeday & Okoro, 2026).

Limited stakeholder engagement corresponds with observations from emerging economies, wherein less participation results in inadequate lessons learned, as stakeholder participation is known to be critical for knowledge sharing (Sherman & Ford, 2014; Love *et al.*, 2016; Williams, 2022). Budget restrictions, which were ranked third, confirm the lack of resources in publicly sponsored projects, further intensified by Nigeria's economic volatility (Opoh *et al.*, 2025;

Aminu, 2025; Nwakanma, 2025). Other factors that are least ranked, including lack of awareness, point to a lack of basic understanding about the reviews, which is in line with previous studies that showed that professionals do not have enough understanding about PMR (Oyewobi *et al.*, 2019; Adebayo *et al.*, 2025). Organisational components, which are due to budgetary and human capital deficiencies, are consistent with PMR failures in resource-constrained situations (Zailani *et al.*, 2019). Process components reveal operational inefficiencies, mirroring global criticisms of PMR scheduling and documentation (Schindler & Eppler, 2003; Duffield & Whitty, 2015). These findings from the study indicate that enhancing PMR implementation necessitates a consistent strategy that will simultaneously tackle human capability, institutional reforms, and management procedures.

4. | Conclusion

This study evaluated the factors affecting the effective application of PMR on completed TETFund building projects in Ekiti State, and it identified multidimensional factors, as acknowledged by 186 professionals that participated in the survey. The main factors identified are the misconception of stakeholders about the PMR process, inadequate involvement of stakeholders in the PMR process, and lack of funds to carry out the process. Exploratory Factor Analysis grouped these barriers into four: human, organisational, resource, and process

components. These groups altogether make up more than 72% of the total variance. Leaving all these factors, which act as barriers, unattended to before embarking on the PMR process will lead to loss of valuable insights for future projects. However, making specific changes could make the learning environment better, which would lead to better results and make building projects last longer. The study therefore recommended that first, TETFund and professional groups should organise PMR training sessions and awareness campaigns along with a strong PMR framework to clear up misconceptions, put policy in place, and help people understand PMR better. Second, set aside specific funds for PMR and apply strict anti-corruption rules using open checks to handle the issue of lack of funds and internal conflicts. By tackling these multidimensional factors holistically, TETFund and other stakeholders can transform PMR into an effective tool for improving project outcomes, enhancing accountability, and promoting sustainable infrastructure delivery in Nigeria's tertiary education sector. Limitations of the study include its focus on a single state (Ekiti), which may limit generalisability to other regions, although the selected institutions are representative. The study also relied on self-reported perceptions. Future multi-regional comparative studies are recommended. Further study can be carried out to compare the way stakeholders prioritized factors affecting PMR on other construction projects as well as compare the opinions of built environment professionals on PMR in different regions of Nigeria.

References

- Adebayo, B. O., Saka, N., and Awodele, O. A. (2025), "Assessing the stakeholders' perceptions of post-mortem review process for TETFund building projects in Ekiti State, Nigeria," in *Proceedings of the 1st Postgraduate Conference of School of Environmental Technology, The Federal University of Technology, Akure, Nigeria*. 1 (1):335-342.
- Adedayo, A. U., & Okoro, D. C. (2026). Conflict management in the Nigerian construction industry: a study on the Kaduna metropolis construction in-

- dustry. *Asian Journal of Research and Development Studies (AJRDS)*, 3(1), 304-322.
- Aghimien, D. O. and Aigbavboa, C. (2018), "Performance of selected funding schemes used in delivering educational buildings in Nigeria," in *Proceedings of the International Conference on Industrial Engineering and Operations Management*. Washington, DC, USA. 54 (3), 121-130.
- Aminu, M.D. (2025), "Nigeria's culture of begging and entitlement is born from corruption," Available at: <https://www.premiumtimesng.com/opinion/825289-nigerias-culture-of-begging-and-entitlement-is-born-from-corruption-by-mohammed-dahiru-aminu.html?tztc=1>
- Anbaria, F. T., Carayannis, E. G., and Voetsch, R. J. (2008), "Post-project reviews as a key project management competence." *Technovation*, 28, 633-643. <https://doi.org/10.1016/j.technovation.2007.12.001>
- Andriyani, Y. (2017), "Knowledge management and reflective practice in daily stand-up and retrospective meetings," in *Agile Processes in Software Engineering and Extreme Programming: 18th International Conference, XP 2017*, Springer, 275-282.
- Ariyo, I. E. and Awodele, A. O. (2015), "Organisational learning through post-mortem project review: Nigerian construction industry experience," in *Proceedings of the Nigerian Institute of Quantity Surveyors: 2nd Research Conference*, 235 - 240.
- Argyris, C. and Schön, D. A. (1996), *Organizational learning II: Theory, method, and practice*. Addison-Wesley.
- Aven, T. (2016), "Risk assessment and risk management: Review of recent advances on their foundation." *European Journal of Operational Research*, Vol. 253 1, 1 - 13. <https://doi.org/10.1016/j.ejor.2015.12.023>
- Bahamid, R. A., Doh, S. I., Khoiry, M. A., Kassem, M. A., and Al-Sharafi, M. A. (2022), "The current risk management practices and knowledge in the construction industry." *Buildings*, 12 (7), Article 1016. <https://doi.org/10.3390/buildings12071016>
- Carrillo, P., Harding, J., and Choudhary, A. (2011), "Knowledge discovery from post-project reviews." *Construction Management and Economics*, 29 (7), 713-723. <https://doi.org/10.1080/01446193.2011.588953>
- CII (2019), Project change management (Construction Industry Institute, pp. 171-172). Available at: <https://www.construction-institute.org/project-change-management> (Accessed: 16 October 2025).
- Curado, C. (2006). Organisational learning and organisational design. *The Learning Organization*, 13 (1), 25-48. <https://doi.org/10.1108/09696470610639112>
- Daboun, O., Abidin, N. I., Khoso, A. R., Chen, Z. S., Yusof, A. M., and Skibniewski, M. J. (2023). Effect of relationship management on construction project success delivery. *Journal of Civil Engineering and Management*. 29 (5), 372-397. <https://doi.org/10.3846/jcem.2023.18800>
- Dekker, S. (2012), *Just Culture: Balancing Safety and Accountability*. 2nd edn. CRC Press.
- Duttfeld, S. and Whitty, J. (2015), "Application of the systemic lessons learned knowledge model for organizational learning through projects." *International Journal of Project Management*. 34 (7), 1280.

- Enshassi, A. A., Arain, F., and El-Rayyes, Y. (2014). "Post-evaluation system in construction projects in Gaza Strip-Palestine." *Journal of Construction in Developing Countries*, 19 (2), 51–73. https://research-repository.rmit.edu.au/articles/thesis/Role_of_knowledge_management_in_supporting_innovation_and_learning_in_construction/27332493
- Gavin, M., and Hannelic, N. (2021). "The importance of post-mortems in construction projects." *Proceedings of the International Conference on Industrial Engineering and Operations Management*, 2021, 1234–1243.
- Jimoh, R. A., Oyewobi, L. O., Abubakar, M. J., and Alabi, K. (2016), "Post-project reviews in the Nigerian construction industry: The barriers and benefits," in *Proceedings of the 10th ICEC Cost Engineering, Quantity Surveying & Project Management World Congress*, 442–455.
- Kerzner, H. (2025), "*Project management: A systems approach to planning, scheduling, and controlling*," 14th edn. Wiley.
- Lan, R., Adenuga, O., and Awolusi, I. (2026). Professionals' perspectives on the factors causing construction project failures in developing countries: A case study of Lagos metropolis. *International Journal of Construction Management*, 26 (3), 511–535.
- Love, P. E. D., Teo, P., and Morrison, J. (2018), "Revisiting quality failure in construction projects." *Journal of Construction Engineering and Management*, 144 (2), Article 04017103. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0001427](https://doi.org/10.1061/(ASCE)CO.1943-7862.0001427)
- Maluleke, M. and Marnewick, C. (2012), "Project reviews: The vehicle for learning in organizations." *African Journal of Business Management*, 6, (44), 10853–10861.
- Maqsood, T. (2024). Role of knowledge management in supporting innovation and learning in construction (Doctoral dissertation, RMIT University). https://research-repository.rmit.edu.au/articles/thesis/Role_of_knowledge_management_in_supporting_innovation_and_learning_in_construction/27332493
- McClory, S., Read, M., and Labib, A. (2017), "Conceptualizing the lessons-learned process in project management: Towards a triple-loop learning framework." *International Journal of Project Management*, 35, (7), 1322–1335. <https://doi.org/10.1016/j.ijproman.2017.05.008>
- Mehvish, R. Paul, M., and Clarke, R. (2019), "A systematic examination of knowledge loss in open-source software projects." *International Journal of Information Management*, 46, 104–123. <https://doi.org/10.1016/j.ijinfomgt.2018.11.008>
- Molwus, J. J. (2014). Stakeholder engagement: A strategy for improving road infrastructure delivery in Nigeria. *International Journal of Humanities and Social Science*, 4, (7), 240–248.
- Nnadi, E. E., Omerhi, O. J., and Boniface, N. A. (2024), "Rating the Delivery Rate of TETFund Projects in South-East Nigerian State Universities." *Journal of Engineering, Technology, and Applied Science (JETAS)*, 6 (1), 19–28.
- Nwafor, M. (2024), "Mitigating uncertainty: Analyzing the role of risk management in the construction industry," PhD thesis, Harrisburg University of Science and Technology. Available at: Digital Commons (Publication No. 24).
- Nwakanma, C. (2025), "Influence of TETFUND Intervention Programs on Infrastructural Development of Tertiary Education Institutions in Nigeria." *Knowledgeable Research: A Multidisciplinary Journal*, 4 (3), 43–52.
- Ojo, S. M. (2021), "The syndrome of project time overrun in Nigeria: A case study of tertiary education

- sponsored building projects.” *International Journal of Environmental Studies and Safety Research*, 6 (4), 1–15.
- Onifade, M. K. (2016). Causes of conflicts in construction projects in Nigeria: Consultant’s and contractor’s perspective. *Nigerian Journal of Technology*.
- Opoh, F. A., Ekpoto, D. F., and Abuh, R. A. (2025), “Assessing TETFund Interventions on Essential Physical Infrastructure for Teaching and Learning in the University of Calabar between 2016 and 2022.”
- Oruko, K., Maixenchs, M., Phillips-Howard, P., Ondire, M., Akelo, C., and Sanz, A. (2020), “Conceptual frameworks for understanding the acceptability and feasibility of the minimally invasive autopsy to determine cause of death: Findings from the CADMIA study in western Kenya.” *PLoS ONE*, 15 (12), Article e0242574. <https://doi.org/10.1371/journal.pone.0242574>
- Oyewobi, L. O., Jimoh, R. A., Suleiman, B., and John, M. (2019). “Post-project reviews in construction: A means to achieving improved project performance.” *Journal of Research Information in Civil Engineering*, 16 (16), 2784-2802.
- Schindler, M., and Eppler, M. J. (2003), “Harvesting project knowledge: A review of project learning methods and success factors.” *International Journal of Project Management*, 21 (3), 219–228. [https://doi.org/10.1016/S0263-7863\(02\)00096-0](https://doi.org/10.1016/S0263-7863(02)00096-0)
- Sherman, M. H., & Ford, J. (2014). Stakeholder engagement in adaptation interventions: an evaluation of projects in developing nations. *Climate Policy*, 14(3), 417-441.
- Solomon, N., Gascho, D., Adolphi, N. L., Filograna, L., Sanchez, H., Gill, J. R., & Elifritz, J. (2025). The evolution of postmortem investigation: a historical perspective on autopsy's decline and imaging's role in its revival. *Frontiers in Radiology*, 5, 1565012.
- TETFund. (2023). *Annual report 2023*. Tertiary Education Trust Fund.
- Umar, U. M. (2025). Evaluating the Effectiveness of Pre-Construction Planning in Achieving Sustainable Outcomes: A Study of TETFUND Projects in Selected North-Western Nigerian Tertiary Institutions.
- Unegbu, H. C., Yawas, D., & Dan-asabe, B. (2023). An assessment of the literature on the performance of construction projects in Nigeria. *Jurnal Mekaniikal*, 27-38.
- Wakwe, A., Onyema, D., and Wakwe, D. (2025). Conceptual analysis of the constraining factors impeding sustainable development efforts in Nigeria. *International Journal of Sustainable Development*, 14(1), 1-32.
- Wapmuk, S., and Amini, G.F. (2018), “The impact of Tertiary Education Trust Fund (TETFund) in funding public higher education in Lagos State.” *West African Journal of Open & Flexible Learning*, 7 (1, pp. 45-60.
- Williams, S. S. Romans, R. Perrone, F. Borden, A. M., and Woodrum, A. (2022), “A case study of lessons learned from a decade of success in preparing and supporting quality school leadership through district-university partnerships.” *Journal of School Leadership*, 32 (1), 351–371. <https://doi.org/10.1177/10526846211067652>
- Zailani, M. B., Kolo, B. A., and Abubakar, M. (2019), “The role of project management in TETFund construction projects,” in Laryea, S., and Essah, E. (eds.), *West Africa Built Environment Research*

(WABER) Conference 10th Anniversary Conference, Accra, Ghana Proceedings.