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Impact of Monitoring and Evaluation System Factors on Labour Force Management Practices Among Indigenous Construction Firms' Projects in Ghana.

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ABSTRACT: The Monitoring and Evaluation System (MES) is part of the life cycle of a construction project, which aids in tracking labour job performance and productivity at any given time, as well as provides reasons for any observed project position. It is also a project management function. This study aimed to determine the impact of monitoring and evaluation system factors on labour force management practices in indigenous construction firms' projects in Ghana. A questionnaire survey was used as the instrument for this study, and the respondents consisted of project managers, engineers, contractors, and consultants in the Ghanaian construction industry. The analysis was carried out using Exploratory Factor Analysis (EFA) and Structural Equation Modelling (SEM). The results showed that, the approach to M&E, M&E information system, Budgetary allocation for M&E, Stakeholder involvement in M&E, Technical capacity and training of the M&E team, Organisational guideline and capacity for M&E, M&E logical framework, Management skills in M&E, Evaluation of labour plan, Labour participation in the M&E process, and Labour plan implementation M&E are the most important factors that affect construction firms labour force management practices in Ghana. It was also gathered that M&E data quality and communication of M&E findings are acknowledged as crucial monitoring and evaluation system factors but with slightly lower average ratings. It can be concluded from the findings that, all the M&ESF considered in this study have a high influence on LFM practices in indigenous construction firms project delivery. Construction project managers and other relevant stakeholders should understand that these significant factors are likely to help the labour force perform extremely well when they use the principles of LFM in their various construction firms. Project managers and engineers should be responsible for creating an environment that can naturally foster M&ES in their labour force operations to enhance LFM practices and thereby achieve excellence in their construction firms.

KEYWORDS: Labour force management, Monitoring and evaluation system factors, Construction firms, Ghana.

I. INTRODUCTION

The construction industry plays a critical role in the development of many countries' economies-. According to Mazhar and Arain (2015), the construction industry's contribution to global GDP is estimated at around 15%. Given the industry's potential contribution to a country's economic development, it is imperative to ensure that resources and activities are managed effectively. This can only be achieved through an effective monitor-ing and evaluation system that measures job performance and project productivity throughout the life cycle of a project (Tengan & Aigbavboa, 2018). Several infrastructure projects initiated by most developing countries have failed for various reasons, including ineffective monitoring and evaluation systems (Kissi et al., 2019; Yu et al., 2018). To ensure the successful execution of construction firms' projects, monitoring and evaluation systems must be implemented holistically throughout the project life cycle. The influence of monitoring and evaluation on project success is not correlated with the practice of monitoring and evaluation of construction projects (Chan et al., 2019; Polat & Demirkesen, 2024). Therefore, little attention has been given to the monitoring and evaluation system as a management practice, despite the overwhelming evidence of its contribution to the execution of construction projects. (Kissi et al., 2019; Umar et al., 2024) also found that M&E is vital to the successful management of construction projects. Decades ago, M&E practices were determined by emphasizing prudent utilisation of resources (Huzooree & Yadav, 2025; Rehan et al., 2024). However, many firms, as well as project managers in the modern era, regard M&E practices as a requirement for success rather than a management tool for project appraisals and for identifying and correcting problems in project planning and implementation (Kissi et al., 2019; Sajjad et al., 2023). MES aims to improve the efficiency and effectiveness of construction projects (Menon, 2024; Ovcina & Arslanagic-Kalajdzic, 2024). It is asserted that M&E is one of the most relevant tools that influence the performance and successful

completion of construction projects (Lee et al., 2020; Naji et al., 2024). Anjomshoa (2024) and Lazari et al. (2024) posit that M&E relates to the value or significance of an activity, policy, or programme. Moreover, as stated by the Organisation for Economic Cooperation and Development (2010), monitoring is an ongoing activity that involves the systematic gathering of data on specific indicators (Anjomshoa, 2024; Lazari et al., 2024). This process aims to provide key stakeholders in a current project with insights into progress and goal achievement. Also, evaluation refers to a systematic and objective assessment of an ongoing or completed project (OECD, 2010).

Further, the poor understanding of the role of the two management functions, "Monitoring" and "Evaluation," can be blamed for the poor job performance and productivity of construction firms in developing countries (Garcés et al., 2025; Ghaly et al., 2024; Ghobakhloo et al., 2023). Similarly, the introduction of monitoring and evaluation across various business sectors has led to occasional misunderstandings regarding the specific factors of these systems in construction project management. In light of this, this study, through a literature review of pertinent databases, elucidates the impact of monitoring and evaluation system factors on LFM practices among indigenous construction firms' projects in Ghana.

Statement of the Problem

The monitoring and evaluation system is the sole project activity that spans all stages of construction projects' life cycles, helping ensure that the project's progress remains on course. The concept of systematic M&E among construction firms is often sidelined, and focus is instead given to other areas of project management, such as initiation, planning, implementation, and closeout (Aigbavboa, 2018; Dahalan et al., 2023; Ovcina & Arslanagic-Kalajdzic, 2024). Alcock (2009), Armstrong and Baron (2013), and Naidoo (2011) contend that a well-implemented monitoring and evaluation system enables project managers to make informed decisions about ongoing projects, thereby contributing to the success of construction firms. (Nguyen et al., 2024; Umar et al., 2024).

Furthermore, indigenous construction firms in Ghana are mandated to carry out both civil and building construction projects. These construction firms primarily struggle with a lack of understanding of the essential elements needed for those involved in the monitoring and evaluation of projects. Top management does not grasp the significance of monitoring and evaluation factors in construction projects. Consequently, they have not established institutional monitoring or evaluation systems. This indicates that while significant progress has been made in delivering construction projects to clients in Ghana, there remains a substantial need for training, workshops, and discussions on M&ES. Additionally, appropriate M&ES must be implemented at the level of indigenous construction firms to improve the delivery of projects. The frequent failures of construction projects prompted this research to assess how M&ES factors influence labour force management practices within indigenous Ghanaians construction firms' projects delivery.

The objectives

- To assess the monitoring and evaluation system factors on labour force management practices of indigenous construction firms in Ghana.
- To determine the effect of monitoring and evaluation system factors on LFM practices of indigenous construction firms.

II. LITERATURE REVIEW

The concept of monitoring and evaluation (M&E)

The origins of M&E are rooted in perceptions of public-sector failures as early as the 1950s (Alizadehsalehi & Yitmen, 2018; Cameron, 1993). Nevertheless, the idea of assessment was discussed in the USA in the 1960s and 1970s, when the state helped fight poverty through the War on Poverty and the Great Society (Lan et al., 2024; Medina-Muñoz & Medina-Muñoz, 2019; Waithera & Wanyoike, 2015). Some projects underperformed (failed), leading to the creation of an independent M&ES unit with responsibilities ranging from collecting data to pro-cessing and analysing it (Huang et al., 2022; Z. Liu & Wang, 2023). The M&E departments were tasked with reporting on project performance relative to the initial targets to both ministries and international agencies. M&E is not a novel concept and has been present in various fields of study and practice, including finance, governance, agriculture, development projects, and health. The focus of M&E has been on accountability and systematic social enquiry, which are central to evaluation research (Egbon, 2024; Hamal et al., 2018; Rahman, 2021). Although the profession is well established and there is existing literature on the subject, the ultimate goal and impact on project delivery remain questionable, as projects often fail to meet quality standards, experience cost overruns, are completed later than planned, and result in overall dissatisfaction among project participants. Project management, as a function of M&E, is among the major drivers of project success. As noted by Kamau and Mohamed (2015), M&E is a critical success factor in project delivery. Achieving project success is nearly impos-sible without continuous M&E, consistent with the literature and practice (Menon, 2024; Ovcina & Arslanagic-Kalajdzic, 2024; Sohal et al., 2022; Kamau & Mohamed, 2015). Kibebe and Mwirigi (2014) ranked ineffective M&E as the top management factor contributing to project failure (Khodabakhshian et al., 2023; Menon, 2024; Nuako et al., 2024). The latter emphasises the importance of monitoring and evaluation in the construction sector. While monitoring and evaluation are two managerial tasks performed closely together to achieve a project's objectives, there are differing opinions regarding their relationship. Whereas M&E are seen as two separate functions by many evaluation schol-ars, others have argued the inseparable nature of the two management functions (Animashaun et al., 2024; Kissi et al.,

2019; Varajão & Trigo, 2024; Musomba et al., 2013; Omonyo, 2015).

Furthermore, the monitoring and evaluation system (M&ES) has become essential for ensuring successful project execution in construction firms. Owing to the varied interpretations and perceptions of construction M&ES, this study provides a theoretical understanding of M&E in the construction context. This highlights the significance of M&E in achieving successful project outcomes for construction firms. This understanding forms the core of formulating actions that can be put forward to enable project teams to set M&E in motion seriously and conclusively to enhance job performance and productivity. Existing studies across various domains have underscored the imperative role of M&E in achieving project success (Kissi et al., 2019; Qureshi et al., 2021; Salzano et al., 2024; Umar et al., 2024; Varajão & Trigo, 2024; Kamau & Mohamed, 2015). From a theoretical standpoint, the concept of M&E has been interpreted and defined in various ways. The absence of a consistent definition for M&E continues to pose a significant challenge in the literature (Dong et al., 2024; Ovcina & Arslanagic-Kalajdzic, 2024; Sreedharan V & Sunder M, 2018; Patton, 2003). To gain a deeper understanding of the diverse and complementary nature of M&E in the context of project delivery within construction firms, this study delineates M&E functions separately. It highlights the distinctions between these two management roles and emphasises their contributions to the success of the firm's projects.

Monitoring

Monitoring is a continuous management function that logically collects data on specific indicators of the project to offer management and stakeholders of an ongoing intervention the indications of the extent to which objectives are being achieved and the progress in the use of the allocated resources (Bangladesh, 2024; Dugbartey & Kehinde, 2025; Ebirim, Usman, et al., 2024) (Omonyo, 2015). Whereas Gudda (2011) described monitoring as an art of collecting project infor-mation to make an informed decision at the right time (Bondar et al., 2024; B. Liu et al., 2024), and Kitchens et al. (2024) defined monitoring as an ongoing process of generating information about the progress being made towards the achievement of results. According to Bamberger and Hewitt (1986), monitoring is an internal project activity designed to provide continuous feedback on progress and the efficiency with which it is being implemented (Animashaun et al., 2024; Ebirim, Olu-Lawal, et al., 2024; Nuche et al., 2024). Monitoring is also applied during project implementation to ensure that the design and operations of the project are enhanced as it progresses. Animashaun et al. (2024) and Ebm et al. (2024) emphasise that monitoring assesses stakeholders' understanding of the project, promotes systematic and professional management, minimises the risk of project failure, and finally assesses progress in implementation.

Abikoye et al. (2024) and Albert et al. (2023) indicate that the World Bank came into the picture by agreeing that several descriptions had been provided about monitoring and further defined monitoring as a constant evaluation of project execution with respect to the agreed work schedule, input, infrastructure, and services consumption by the beneficiaries. Chipato (2016) identified monitoring as the ongoing process by which stakeholders receive regular feedback on progress towards achieving their goals and objectives. Chipato (2016) further stressed that monitoring implies a continuing opera-tion conducted during project implementation to ensure that the project remains on track to achieve its objectives.

The mon-itoring exercise may be used to improve project effectiveness during implementation: the project should be flexible and able to adapt to conditions on the ground, as indicated by the exercise (Chipato, 2016). Monitoring is carried out once a program is already being implemented and continues throughout the program implementation period. Monitoring is sometimes referred to as process, performance, or formative evaluation (Amaechi et al., 2022; Wiefek et al., 2024).

The three types of monitoring

In monitoring research, two researchers (Tache 2011) have identified various types of

monitoring and classified monitoring into three generic categories: 1). Baseline monitoring 2). Impact monitoring and 3). Compliance monitoring.

Baseline monitoring is the value of measuring economic, social, and environmental needs prior to a project to determine existing conditions, levels of variation, and the change process.

Impact monitoring is the measurement of social and environmental variables during project development and operations to determine the impact which could have occurred due to the project.

Monitoring compliance involves assessing compliance with donor rules, contract terms, local Western regulations, building by-laws, and ethical standards in providing the undertaking. Another similarity between (Li et al., 2022) is the division of monitoring into three groups: 1) Process or activity-based monitoring, 2). Outcome-based monitoring 3). Implementation monitoring.

Process or activity-based monitoring involves executing tasks to meet time and budgetary goals. However, it falls short of connecting these tasks to outcomes, making it difficult to determine how they contribute to enhanced performance. It also monitors the consumption of resources and inputs, the flow of activities, and the output delivery. It monitors the manner in which activities are provided in terms of efficiency in time and resources. To connect with monitoring the overall aim of a project and its impact on society, that is, results-based monitoring. This type of monitoring integrates M&E to ensure that projects can achieve their intended results. It is recognised for its comprehensive approach, which aligns

activities, processes, inputs, and outputs with desired outcomes. This method is often described as the ideal form of monitoring.

Implementation monitoring concerns the monitoring of the methods to be used in project delivery to achieve the desired results. This is to ensure that correct inputs and activities are employed in the production of output and compliance, which can result in a set output. Thus, monitoring will focus on resources, activities, goals (results, purpose development goal), and basic assumptions.

Evaluation

The term "evaluation" refers to the objective, systematic assessment of project activities to determine their relevance, effectiveness, efficiency, and impact (Gong et al., 2021). Project evaluation plays a significant role in project implementation; it informs decision-making for improvement, ensures organizational learning from experience to improve future monitoring and evaluation practice, and helps managers acquire new skills to be better managers in the future (Njama, 2015). Stufflebeam and Moradi et al. (2020) state that one of the earliest and still most prominent definitions states that it means determining whether objectives have been achieved. Evaluation also helps organisations understand their strengths, weaknesses, opportunities, and threats (SWOT) for effective M&E (Ghaleb, 2024; Rony et al., 2024). Furthermore, evaluation establishes benchmarks to guide the evaluation of other projects by creating a knowledge bank for management, thereby fostering organizational learning (Alsakarneh et al., 2024). Evaluation provides the basis for concluding the efficiency, effectiveness, and success or failure of projects (Agrawal et al., 2020; Alsakarneh et al., 2024). Evaluation is arguably society's most fundamental discipline, as it is oriented towards assessing and improving society as a whole (A. Garro & F. Barrara, 2024). They also defined evaluation as a method for providing testimony on issues such as reliability, effectiveness, cost-effectiveness, efficiency, safety, ease of use, and probity. Evaluations may involve assessing the extent to which objectives have been met, drawing on data and information generated through monitoring (Sagharidooz et al., 2024). In carrying out an evaluation, the evaluator needs to pay attention to the evaluation's root term value in addressing the merit, worth, probity, and significance regarding excellence, utility, uncompromising adherence to the basic moral standards, reach, importance, and visibility of the project (Jankalová & Jankal, 2018; Kportorgbi et al., 2024). More specifically, evaluation is a process of delineating, obtaining, reporting, and applying descriptive and judgmental information about an object's merit, worth, probity, and significance (Teasdale, 2021).

The three types of evaluation

Evaluation can be classified into several types depending on the intended purpose or stage of implementation (Omonyo, 2015). Considering the timing of the evaluation, three types of evaluation exist according to Tache (2011) and Gudda (2011), they are 1). Ex-ante evaluation in-2). Vivo or mid-term evaluation and 3). Ex-post evaluation.

Ex-ante evaluation refers to an assessment conducted before the commencement of a project. In vivo or mid-term evaluations are conducted during the project's execution phase. This type of evaluation is formative and can be repeated as needed to provide the required information. The final evaluation, conducted only after a project's implementation, is a summative assessment typically carried out by external evaluators. Ex-post evaluation, conducted after the final evaluation, aims to assess a project's sustainability or its impact on the community benefiting from it. Other classifications are based on the implementers or those responsible for the evaluation, namely, whether the evaluation is undertaken internally by persons directly involved with the project or externally by stakeholders and donor agencies (Barriga & Escandon-Barbosa, 2024; Rumanti et al., 2021). Learning from evaluation then extends beyond organizational learning; it also encompasses advancing knowledge in development (Fonseca et al., 2024; UNDP, 2009).

firm's labour force

The Monitoring and Evaluation System is a process that, by influencing the outcomes of a project, enables construction project managers to improve labour performance and productivity levels within a firm. M&ES of the construction labour force is known as an inevitable management operation. It is useful for monitoring the functioning of a labour force. It also provides frequent reports on the labour force, including their delivery and targeted outputs. The monitoring and evaluation system is an important aspect of job performance and labour force productivity. Through monitoring and evaluation systems, information is collected and analysed to track the progress of labour force work (Calvetti et al., 2020; Gazi et al., 2024). Monitoring and evaluation systems involve the routine collection and analysis of information to track the progress of the labour force (Nwaogu et al., 2019; Riau et al., 2024). Again, Aghimien et al. (2021) and Manoharan et al. (2020) outline the key monitoring and evaluation activities in a construction firm. They involve a preliminary needs assessment, system planning for monitoring and evaluation, and baseline studies. It also stated that monitoring and evaluation require attention to the use of the labour force and the efficiency of project implementation to ensure that the quality of the construction project meets the goals set. Ebirim, Usman, et al. (2024) established that management in construction firms should be able to identify the purpose and scope of the M&E system, plan for information reporting and utilisation, collect and manage data, analyse data, and monitor and build the capacity of the labour force. Tasheva and Karpovich (2024) showed that knowledge of monitoring

and evaluation helps management effectively monitor and evaluate the labour force, thereby improving a firm's job performance and productivity.

Further, Bhat and Sheikh, (2024) and Mustafa and Lleshi, (2024) studies established the constraints and problems that hamper the monitoring and evaluation of labour force work, including a lack of commitment to conducting monitoring and evaluation, discussing, sharing, and incorporating the results of monitoring and evaluation activities, shortage of trained staff, insufficient technical resources, inadequate allocation of funds for monitoring and evaluation, and limited training opportunities, which usually execute construction projects.

The benefits of monitoring and evaluation system of construction firms' projects

Studies have shown a plethora of benefits derived from an effective monitoring and evaluation system of construction projects (Kamau & Mohamed, 2015; Otieno, 2000; Tache, 2011). The aim of implementing monitoring and evaluation is to guarantee the ultimate success of a project by achieving short-term goals, such as adherence to standards and meeting budget and schedule requirements, as well as long-term goals, such as ensuring that the project is fit for its intended purpose (impact). The collective achievement of all immediate out-comes indicates that M&E is effective, and therefore, the project is successful (Lagos & Alarcón, 2021; Umar et al., 2024). Ebekozien (2021) revealed that conformity to project specifications (qual-ity) is achieved when projects are effectively monitored and evaluated. The study further accentuates the achievement of projects within the approved budget (cost) and project duration (time) when M&ES is effectively undertaken (Ebekozien, 2021). Good project M&E practice creates a healthy project environment for implementation, ensuring that all stakeholders are well represented and given a chance to be part of the project. Project resources are scarce and should be used prudently. An even more valuable advantage of good M&ES is the knowledge that project activities are being performed correctly the first time, thereby avoiding rework (which is the probable net cause of project budget and schedule overruns) due to design and construction malfunctions.

In addition, the result of M&ES activities is enhanced communication among various stakeholders. This provides stakeholders with a superior understanding of implementation concerns about every aspect of the undertaking. An environment where effective communication can take place and dialogue can continue is constructive. Establishing transparent and accessible communication channels, such as regular meetings, workshops, and dissemination of information via the Internet or print media, is essential. From this, it can be deduced that the hallmarks of a successful project, such as timely completion, adherence to standards, cost management, stakeholder contentment, contractor efficiency, health and safety, value for money, environmental performance, end-user satisfaction, client approval, and the project's continued relevance, are achieved through effective implementation of M&ES construction projects.

Theory of change

The theory of change approach first emerged in the USA in the mid-1990s to improve evaluation theory and practice (Kissi et al., 2019; Umar et al., 2024; Stein & Valters, 2012). The theory of change not only sought to improve evaluation theory and practice but also evolved in response to the emphasis on outcomes and accountability placed by project and programme funders (Kabonga, 2019). This has placed much emphasis on the necessity of the theory of change. As postulated by Weiss (2004), the theory of change holds that a key reason a complex project fails is that its underlying expectations are poorly articu-lated (Omonyo, 2015; Hien et al., 2024; Zangana et al., 2024). Various definitions exist of what theory of change means across organisations in the evaluation field (Dombrowski et al., 2021). A theory of change is a critical thinking product or process that provides a broad view of the initial and intermediate changes required to reach a long-term goal. Bekius and Gomes (2023) asserted that the theory of change is a rigorous, participatory process for planning a project's long-term goals with stakeholders through the identification of interventions believed to lead to the achievement of the project's long-term objective. In other descriptions, Bekius & Gomes (2023) argued that a theory of change is a set of philosophies that describe the expected change, how the process will unfold, what drives it, and what must be done to achieve the intended results. He also considers this to be the envious role of project stakeholders. Therefore, the theory of change can be explained as an assumption about how direct interventions contribute to achieving project success (Ignatius Teye Buertey, 2016). The theory of change approach has been adopted in many fields, predominantly by international non-governmental organisations for evaluation purposes (Ignatius Teye Buertey, 2016).

Program theory

The program theory of evaluation has increased in utilisation over the last 10 years. It determines whether a program is planned in a manner that it can deliver the results it is supposed to deliver. Program theory is a guidance theory in project evaluation because it demonstrates a program's ability to address specific issues in projects that require evaluation (Eyieyien et al., 2024). It also provides guidance on the areas that should be emphasized during the evaluation process (Chen, 2015). Program theory is utilised in this study because it provides information that can lead to additional insights into how management affects M&E during project execution. This theory can be effectively employed whenever necessary to provide solutions and alternative steps to achieve the desired outcomes for projects that require evaluations. Additionally, it can improve decision-making and broaden understanding of solutions to project-related issues

(Animashaun et al., 2024; Kissi et al., 2019; Kabongo et al., 2020).

III. METHODOLOGY

Research is the methodical and data-supported pursuit of a response to questions, solutions to a problem, or a better understanding of an occurrence (Johnson et al., 2022, Kabir, 2016). A quantitative research approach was used to examine numerical data through statistical procedures for this study the reason is according to Creswell (2014) and Carcary (2020), a quantitative research approach should be used to examine numerical data through statistical procedures. In this study, a non-probabilistic structured questionnaire survey was used to collect information from identified respondents of construction companies in Ghana. This approach was chosen to ensure that the research was easily answerable, unbiased, succinct, and straightforward to analyse (Khan et al., 2023). The study participants comprised a diverse group of professionals within the Ghanaian construction industry, including project managers, engineers, contractors, and consultants. Table 1 presents a summary of the respondents' demographic information, including gender, age, job roles, educational background, and work experience. These data are essential for comprehending the sample characteristics and interpreting the study results. Participants were asked to evaluate each factor using a five-point Likert scale, indicating their level of agreement or disagreement with factors such as the monitoring and evaluation system that affects LFM practices in Ghana's construction industry. A sample frame was created by compiling a list of reputable construction companies obtained from the Association of Building and Civil Engineering Contractors of Ghana (ABCECG). At the time of data collection, 1284 construction firms were registered and in good standing with the ABCECG. In this study, the goal was to sample 40% of the study population. This decision was informed by Leedy and Ormrod's recommendation, as cited in Leedy et al. (2010), which suggests that for a population of approximately 1500, at least 20% should be sampled. Therefore, a sample size of 514, which is 40% of 1284, was considered adequate for this study. Again, a probability sampling technique was used in this study to obtain representation from all segments of construction firms. A simple random sampling method was adopted, through which every member of the population had an equal chance of being selected (Kissi et al., 2024). For all these reasons, firms in Ghana, the nature, and composition of firms dictated the use of this sampling approach, and Tapera et al. (2020). supports that random sampling is suitable for such studies. The 514 questionnaires given to construction professionals in Ghana yielded a response rate of 91.82%, with 472 completed and returned. The data gathered were coded and examined using advanced statistical techniques. Various multivariate approaches were employed, including multivariate correlational analysis with EFA using SPSS version 26, structural equation modelling (SEM) using AMOS version 21, and confirmatory factor analysis (CFA). Additionally, the study elaborates on the statistical methods used to assess the validity and reliability of the measurement tool and the quantitative survey outcomes. This section begins with an evaluation of the participants' demographic details. This was followed by scrutinising their responses to the specific objectives. Respondents' backgrounds were analysed using frequency and percentage distribution.

IV. FINDINGS

This section outlines the empirical results obtained by analysing the survey data gathered from construction professionals in Ghana. The findings are divided into two primary sections: a descriptive analysis of the identified factors related to the M&E system and the results of multivariate statistical analyses. These analyses included the demographic characteristics of the study participants, EFA, CFA, and SEM.

A. Demographic characteristics among the Study Participants

The analysis of the demographic characteristics of the study participants revealed a nuanced profile of the respondents. The gender distribution indicated a predominant presence of males (68.9%), with females accounting for a sizable but lesser proportion (25.4%), and a smaller fraction chose not to disclose their gender (5.7%). The respondents spanned a broad age spectrum, with the highest representation in the 41-45 years bracket (37.9%), followed by individuals aged 46 years or older (17.2%), showcasing a mature and experienced cohort.

Regarding occupation, the sample reflected a diverse labour force, prominently comprising civil engineers (38.1%), project managers (20.1%), and architects (15.3%). The educational qualifications exhibited a well-educated cohort, with a significant majority holding master's (50.6 %) or bachelor's (42.2 %) degrees, although those with doctoral degrees (PhD) constituted a smaller fraction (4.9%). Regarding professional experience, a notable portion of respondents had substantial work tenure, especially within the category of 31 or more years (33.9%), followed closely by the 26-30 years category (24.6%).

The firms which participated in the study predominantly engaged in civil engineering projects (51.5%), while the others engaged in building construction projects (48.5%). Past project experiences have varied. A significant proportion of firms have worked on seven or more projects (61.9%). Furthermore, insights into the firms' demographics revealed a varied landscape, with firms existing for 26-30 years (44.5%) and 31 or more years (34.1%) forming the majority. In terms of classification, the D3/K3 classification represented the largest segment (53.0%), followed by D4/K4 (26.3%).

B. Descriptive Analysis of Monitoring and evaluation system factors

Table 2 provides a structured presentation of the findings related to the monitoring and evaluation system factors in Ghanaian construction firms. The Table 1. delves into monitoring and evaluation system factors (MESF), showcasing their perceived importance within organisational frameworks based on mean values and standard deviations. The factors related to the approach and information systems in Monitoring and Evaluation (M & E) processes, such as Approach to M & E and M & E information systems, received notably high mean ratings of 4.42 and 4.30, respectively. This collective agreement among respondents highlights the crucial role these elements play in effective monitoring and evaluation. While there are slight variations in perceptions, indicated by standard deviations of 0.866 and 0.823, the overall consensus underscores their critical contributions to the field. M & E data quality and communication of monitoring and evaluation findings, although slightly lower in mean scores at 3.93 and 3.92, respectively, are still recognised as significant contributors to robust monitoring and evaluation practices. The standard deviations of 0.887 and 0.818 suggest some diversity in opinions but an overall recognition of their importance in ensuring reliable M&E outcomes. Factors such as Budgetary allocation for monitoring and evaluation and stakeholder involvement in monitoring and evaluation received moderate to high mean ratings (4.13 and 3.96, respectively), signalling their perceived significance in the monitoring and evaluation landscape. However, the standard deviations of 0.793 and 0.910 indicate varying perspectives on their impact among the respondents. Other factors, such as technical capacity and training, organisational guidelines and capacity, and monitoring and evaluation logical framework garnered moderate mean ratings (ranging from 3.77 to 3.97), suggesting their perceived importance but with differing degrees of consensus among respondents. The standard deviations (ranging from 0.883 to 0.907) further highlight differing viewpoints regarding their direct influence on monitoring and evaluation effectiveness.

Table 1: Monitoring and Evaluation System Factors (MESF)

Variables	Code	Mean	SD
Approach to M & E	MESF1	4.42	0.866
M & E information systems	MESF2	4.30	0.823
M & E data quality	MESF3	3.93	0.887
Communication of M & E findings	MESF4	3.92	0.818
Budgetary allocation for M & E	MESF5	4.13	0.793
Stakeholder involvement in M & E	MESF6	3.96	0.910
Technical capacity and training of the M & E team	MESF7	3.97	0.907
Organisational guidelines and capacity for M & E	MESF8	3.88	0.896
M & E logical framework	MESF9	3.77	0.903
Management skills in M & E	MESF10	3.96	0.883
Labour participation in the M & E process	MESF11	3.95	0.852
M & E of labour plans implementation	MESF12	3.97	0.897

Table 2: Uni-dimensionality and Reliability of M&ES Factors Construct

Variables	MESF	Corrected item-total correlation	Squared multiple correlation	Cronbach's Alpha if item is deleted	Cronbach's Alpha
Labour participation in the M & E process	0.689	0.392	0.386	0.834	0.838
Management skills in M & E	0.678	0.481	0.473	0.828	
Stakeholder involvement in M & E	0.672	0.463	0.480	0.829	
Organisational guidelines and capacity for M & E	0.651	0.524	0.445	0.824	
M & E logical framework	0.637	0.428	0.236	0.831	
Communication of M & E findings	0.615	0.567	0.411	0.821	
Technical capacity and training of the M & E team	0.585	0.477	0.350	0.828	
M & E information systems	0.564	0.548	0.348	0.822	
M & E data quality	0.556	0.530	0.389	0.824	

M & E of labour plans implementation	0.538	0.576	0.430	0.820	
Budgetary allocation for M & E	0.522	0.586	0.410	0.820	
Approach to M & E					

Extraction method: Principal component analysis.

A. 1 component extracted.

An EFA was conducted to assess the uni-dimensionality and reliability of the Monitoring and Evaluation System Factors (MESF) construct. The extraction and rotation method employed was the maximum likelihood with varimax rotation (ML varimax). The construct was measured using 12 items. The Kaiser-Meyer-Olkin (KMO) of 0.852 with Bartlett's test of sphericity of $p<0.000$ was also obtained, indicating consistency with the recommended KMO cut-off value of 0.70 and Bartlett's test of sphericity of $p<0.05$ suggested by Hair et al., (2010). The findings indicate that it is possible to perform factor analysis on the data. All 12 items (MESF1, MESF2, MESF3, …, MESF12) which were expected to measure Monitoring and Evaluation System Factors (MESF) loaded one component.

Using a threshold of 0.5 for factor loading which is greater than the recommended value of 0.40 as suggested by Field (2005) and Hair et al. (1998), some of the items had their factor loading exceeding 0.5 for the respective component, excluding "Approach to M & E" which recorded a threshold below 0.5, making them a bad representative of the component.

For the component, eleven (11) items recorded a threshold of more than 0.5. They are "Labour participation in The M & E process," "Management skills in M & E," "Stakeholder involvement in M & E," "Organisational guidelines and capacity for M & E," "M & E logical framework," "Communication of M & E findings," "Technical capacity and training of The M & E team," "M & E information systems," "M & E data quality," "M & E of labour plans implementation, " and "Budgetary allocation for M & E". These items measure monitoring and evaluation system factors (MESF). Thus, they are called monitoring and evaluation system factors (MESF).

After using the EFA to extract the component, the corrected item-total correlation for the items of the component was extracted using the suggested cut-off value of 0.30. It was found that the items were good measures of the components since the Cronbach's alphas were greater than 0.800 at 0.838 for the component (MESF), indicating acceptable internal reliability (Nanually & Bernstein, 1994).

After the constructs demonstrated sufficient evidence of unidimensionality and reliability using EFA, a CFA was administered. The analysis strategy of goodness-of-fit for the Monitoring and evaluation system factors (MESF) followed a three statistics strategy of fit indexes as recommended by Hu and Bentler (1999). The sample data on the Monitoring and Evaluation System Factors (MESF) model yielded an S-Bχ2 of 5.143 with 14 degrees of freedom (df) and a probability of $p = 0.0000$. This chi-square value indicates that the departure of the sample data from the postulated model was significant and hence, indicative of good fit. The chi-square test is very sensitive to sample size and is used more as a descriptive index of fit than as a statistical test (Kline, 2005).

The CFI value was determined to be 0.941, which was higher than the cut-off value of 0.90; thus, the model was acceptable. The NFI value was 0.928, which fell within the provided range; however, the provided cut-off value of NFI was NFI 90, as revealed in Table 8.39. Thus, the model is applicable. The PNFI value is 0.619, which is below the cutoff value of 0.80. The RMR of 0.036 is less than 0.05, and the GFI value of 0.958 is greater than 0.90. As shown in Table 2, the fit indices of the Monitoring and Evaluation System Factors (MESF) model indicated that the hypothesised model fit the data of the sampled population well and hence, can be considered in the complete analysis of the latent variable model (Table 2).

Table 3: Robust Fit Index for MESF

Fit Index	Cut-Off Value	Estimate	Comment
S-Bχ^2		5.143	
Df	0≥	14	Acceptable
CFI	0.90≥ acceptable 0.95≥ good fit	0.941	Acceptable
PCFI	Less than 0.80	0.627	Good fit
RMSEA	Less than 0.08	0.074	Acceptable
RMSEA 95% CI	0.00-0.08 "good fit"	0.011-0.073	Acceptable
NFI	Greater than 0.90 "good fit"	0.928	Good fit
IFI	Greater than 0.90 "good fit"	0.941	Good fit
PNFI	Less than 0.80	0.619	Good fit
RMR	Less than 0.05 "good fit"	0.036	Acceptable
GFI	Greater than 0.90 "good fit"	0.958	Not a Good fit

The unidimensional model for monitoring and evaluation system factors (MESF) features are presented (Figure 8.8 and Table 8.40). Of the twelve (12) indicator variables, seven (7) were obtained and used for the final CFA analysis. (Byrne, 2006: Joreskog and Sorbom, 1988). From the 472 cases analysed for this construct, seven (7) indicator variables made up of a component realised as MESF (MESF1, MESF2, MESF3, MESF4, MES5, MESF7, and MESF10).

Table 4: Final Conceptual Model Indicator Variables for Monitoring and Evaluation System Factors (MESF)

Latent component	Indicator variable	Measurement variable	Label
Monitoring and Evaluation System Factors (MESF)	MESF11	Labour participation in the M & E process	MESF1
	MESF10	Management skills in M & E	MESF2
	MESF6	Stakeholder involvement in M & E	MESF3
	MESF8	Organisational guidelines and capacity for M & E	MESF4
	MESF9	M & E logical framework	MESF5
	MESF7	Technical capacity and training of the M & E Team	MESF7
	MESF10	M & E of labour plans implementation	MESF10

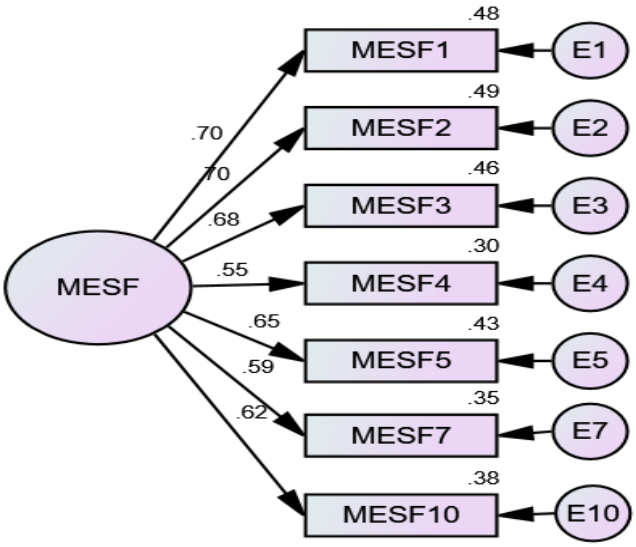

Figure 1: CFA model for MESF

Table 5. presents the values of the correlations, standard errors, and test statistics of the final model with seven indicator variables. All correlation values were less than 1.00, and all p-values were less than the significance value of 0.05 and were of the right signs. The estimates obtained were thus found to be plausible, in addition to being statistically significant. The standardised coefficient that was the greatest was that of an indicator with variable MESF2, and its parameter coefficient was 0.698.

Table 5: Factor Loading and P-Value of MESF

Hypothesised relationships (Path)	Unstandardised coefficient (λ)	Standardised coefficient (λ)	P-Value	R- Square	Significant at 5% level
MESF1 ← MESF	1.000	0.695	0.00	0.484	Yes
MESF2 ← MESF	1.040	0.698	0.00	0.487	Yes
MESF3 ← MESF	1.046	0.681	0.00	0.464	Yes
MESF4 ← MESF	0.834	0.552	0.00	0.304	Yes
MESF5 ← MESF	0.997	0.654	0.00	0.428	Yes
MESF7 ← MESF	0.903	0.590	0.00	0.348	Yes
MESF10 ← MESF	0.934	0.617	0.00	0.381	Yes

Most parameter estimates exhibited high correlation values, nearly reaching 1.00. These elevated correlation values indicate a strong linear relationship between the indicator variables and the unobserved variables related to the MESF.

Additionally, the R-squared values were close to the anticipated value of 1.00, suggesting that the factors accounted for a significant portion of the variability in the indicator variables. Consequently, it can be hypothesised that the indicator variables are also significant predictors of the unobserved constructs, as all the measured variables are crucial predictors of the components within the M&ESF.

B. Summary of findings

A descriptive analysis was performed on the twelve (13) factors, and it was found that the factors related to the approach and information systems in monitoring and evaluation (M&E) processes, such as approach to monitoring and evaluation and M&E information systems, received notably high mean ratings of 4.42 and 4.30, respectively. This collective agreement among respondents highlights the crucial role these elements play in effective monitoring and evaluation. While there are slight variations in perceptions, indicated by standard deviations of 0.866 and 0.823, the overall consensus underscores their critical contributions to the field.

Despite slightly lower average scores of 3.93 and 3.92, the quality of monitoring and evaluation data and the communication of their findings are acknowledged as important elements in effective monitoring and evaluation practices. The standard deviations of 0.887 and 0.818 suggest some diversity in opinions but an overall recognition of their importance in ensuring reliable M&E outcomes.

Elements such as the allocation of funds for monitoring and evaluation, as well as the involvement of stakeholders in these processes, received average ratings of 4.13 and 3.96, respectively, indicating their recognised importance in the M & E field. However, the standard deviations of 0.793 and 0.910 indicate varying perspectives on their impact among the respondents.

Other factors, such as technical capacity and training, organisational guidelines and capacity, and monitoring and evaluation logical framework garnered moderate mean ratings (ranging from 3.77 to 3.97), suggesting their perceived importance but with differing degrees of consensus among respondents. The standard deviations (ranging from 0.883 to 0.907) further highlight differing viewpoints regarding their direct influence on monitoring and evaluation effectiveness.

The findings on the monitoring and evaluation system factor (MESF) in the Ghanaian construction industry provide critical insights into the factors perceived as essential to effective monitoring and evaluation. The notably high mean ratings for factors such as the approach to monitoring and evaluation (4.42) and monitoring and evaluation information systems (4.30) underscore respondents' consensus on the vital role these elements play in robust monitoring and evaluation. The slight variations in perceptions, as indicated by the standard deviations of 0.866 and 0.823, highlight the general agreement on their importance. This aligns with the existing literature, which emphasizes the significance of systematic approaches and reliable information systems in ensuring effective project monitoring and control (Frimpong et al., 2020; Tengan & Aigbavboa, 2018).

Similarly, monitoring and evaluation data quality and the communication of monitoring and evaluation findings were also recognised as key contributors, with mean scores of 3.93 and 3.92, respectively. Despite slightly lower mean ratings than other factors, their overall importance is evident. The standard deviations of 0.887 and 0.818 suggest some diversity in opinions, indicating areas where organisations might need to focus on standardising data quality and communication practices. These findings resonate with those who highlighted the critical nature of data quality and effective communication in project management and performance monitoring (Abikoye et al., 2024; Eyieyien et al., 2024; Kang & Sung, 2017).

Budgetary Allocation for monitoring and evaluation and stakeholder involvement in monitoring and evaluation received moderate to high mean ratings of 4.13 and 3.96, respectively. This suggests significant recognition of the need for adequate funding and of stakeholder involvement in monitoring and evaluation processes. The variability in perceptions, reflected in standard deviations of 0.793 and 0.910, indicates differing views on their impact, aligning with research by Animashaun et al. (2024), Ebirim, Usman, et al. (2024), and Mi & Li (2024), which discuss the importance of resource allocation and stakeholder engagement in effective project execution and monitoring. Other factors, such as technical capacity and training, organisational guidelines and capacity, and monitoring and evaluation logical framework, received moderate mean ratings, ranging from 3.77 to 3.97. While these factors are recognised as important, there is a broader range of perceptions about their direct influence on monitoring and evaluation effectiveness, as indicated by standard deviations ranging from 0.883 to 0.907. This variability suggests areas where organisations might need to enhance training and capacity building to align with best practices in M&E. Gupta et al. (2014), Animashaun et al. (2024), Ebm et al. (2024), and Sposito et al. (2023) support these findings, emphasising the role of technical expertise and structured frameworks in enhancing monitoring and evaluation processes.

C. Conclusion

Construction companies would want to improve their labour job performance and productivity in terms of profits and client satisfaction, which requires the adoption of the above-mentioned factors of the monitoring and evaluation system. This research was meant to add to the debate concerning monitoring and evaluation systems, and especially to identify the factors that affect a successful application of the monitoring and evaluation system regarding how the participants perceive the various variables that apply in using

LFM in the construction industry in Ghana. It is expected that the conclusions of this study will fill the gap in the literature regarding the most important system factors of monitoring and evaluation that interfere with the use of LFM in the Ghanaian construction industry. To sum up, the thirteen monitoring and evaluation factors monitoring and evaluation system factors have been found by the study as the most powerful in relation to successful utilization of LFM by the construction firms. These are: Approach to M&E, M&E Information system, M&E data quality, Communication of M&E findings, Budgetary allocation for M&E, Stakeholder involvement in M&E, Technical capacity and training of the M&E team, Organisational guideline and capacity for M&E, M&E logical framework, Management skills in M&E, Evaluation of labour plan, Labour participation in the M&E process, Labour plans implementation M&E are the most important factors of the construction firms. It can be concluded from the results

D. Recommendation

This study suggests that managers and other important stakeholders should recognise the crucial factors that can enhance the workforce's effectiveness and efficiency when applying the LFM principle in construction companies. Additionally, construction project managers and engineers should incorporate monitoring and evaluation system factors into their strategic planning to maintain high levels of job performance and productivity. Other service-oriented, profit-driven companies can also adopt these monitoring and evaluation system factors to boost their labour performance and productivity. The researcher further contends that managers have the responsibility to create an environment that naturally supports the labour force, thereby enhancing LFM and achieving excellence in project delivery in construction firms in Ghana.

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Competing interests

The authors declare that no conflicts of interest exist.

REFERENCES

1. Abikoye, B., Akinwunmi, T., Umeorah, S., Ogunsuji, Y., & Adelaja, A. (2024). Real-time financial monitoring systems: Enhancing risk management through continuous oversight. GSC Advanced Research and Reviews, 20(1), 465–476. https://doi.org/10.30574/gscarr.2024.20.1.0287
2. A Garro, A., & F Barrara, F. (2024). Reliability Analysis of Residential Photovoltaic Systems. RE& PQJ, 9(1), 1197–1202. https://doi.org/10.24084/repqj09.594
3. Aghimien, L. M., Thwala, W. D., Aigbavboa, C. O., & Anumba, C. J. (2021). A confirmatory factor analysis of the challenges of effective management of construction workforce in South Africa. Journal of Engineering, Design and Technology, 21(4), 1134–1152. https://doi.org/10.1108/jedt-05-2021-0264
4. Agrawal, A., Kumar, C., & Mukti, S. K. (2020). Role of Information and Communication Technology (ICT) to Enhance the Success of Knowledge Management (KM): a Study in a Steel Plant. Journal of the Knowledge Economy, 12(4), 1760–1786. https://doi.org/10.1007/s13132-020-00694-6
5. Albert, A., Islam, S., Haklay, M., & Mceachan, R. R. C. (2023). Nothing about us without us: A co-production strategy for communities, researchers and stakeholders to identify ways of improving health and reducing inequalities. Health Expectations : An International Journal of Public Participation in Health Care and Health Policy, 26(2), 836–846. https://doi.org/10.1111/hex.13709
6. Alizadehsalehi, S., & Yitmen, I. (2018). A Concept for Automated Construction Progress Monitoring: Technologies Adoption for Benchmarking Project Performance Control. Arabian Journal for Science and Engineering, 44(5), 4993–5008. https://doi.org/10.1007/s13369-018-3669-1
7. Alsakarneh, A., Eneizan, B., Shatnawi, H. A., Alrababah, R. A. M., Alhyasat, W. B. A. K., & Zowid, F. (2024). The effectiveness of human resource management practices on increasing organizational performance and the mediating effect of employee engagement. Uncertain Supply Chain Management, 12(2), 1141–1154. https://doi.org/10.5267/j.uscm.2023.11.019
8. Amaechi, C., Ja'E, I., Wang, C., Reda, A., & An, C. (2022). Guidelines on Composite Flexible Risers: Monitoring Techniques and Design Approaches. Energies, 15(14), 4982. https://doi.org/10.3390/en15144982
9. Animashaun, E., Onyebuchi, N., & Familoni, B. (2024). Strategic project management for digital transformations in public sector education systems. International Journal of Management & Entrepreneurship Research, 6(6), 1813–1823. https://doi.org/10.51594/ijmer.v6i6.1167
10. Anjomshoa, E. (2024). Key performance indicators of construction companies in branding products and construction projects for success in a competitive environment in Iran. Engineering, Construction and Architectural Management, 31(5), 2151–2175. https://doi.org/10.1108/ecam-08-2023-0852

11. Badom, L. N. (2016). Project monitoring and evaluation: A critical factor in budget implementation, infrastructure development and sustainability. In: Nigerian Institute of Quantity Surveyors' National Workshop with the Theme: "Budgeting and Capital Project Monitoring and Evaluation in an Era of Change" at Precious Conference Centre, Benue Hotels, Makurdi, Benue State, Nigeria on 27th - 28th July, 2016
12. Basheka, B. C. & Byamugisha, A. (2015). The state of monitoring and evaluation (M&E) as a discipline in Africa. African Journal of Public Affairs, 8(3), pp. 75–95.
13. Badom, L.N. (2016). Project monitoring and evaluation: a critical factor in budget implementation, infrastructure development and sustainability. In: Presented at the Nigerian Institute of Quantity Surveyors' National Workshop, Makurdi, Benue State, Nigeria.
14. Basheka, B.C., Byamugisha, A. (2015). The state of Monitoring and Evaluation as a discipline in Africa. Afr. J. Public Aff. 8(3), 75–95.
15. Bangladesh, T. (2024). Artificial Intelligence in Project Management: Enhancing Efficiency and Decision-Making. GLOBAL MAINSTREAM JOURNAL, 1(1), 1–6. https://doi.org/10.62304/ijmisds.v1i1.107
16. Barriga, R. H., & Escandon-Barbosa, D. (2024). Synergizing board dynamics, sustainability, and strategy for international success. Corporate Social Responsibility and Environmental Management, 31(4), 3368–3378. https://doi.org/10.1002/csr.2742
17. Bekius, F., & Gomes, S. L. (2023). A framework to design game theory-based interventions for strategic analysis of real-world problems with stakeholders. European Journal of Operational Research, 309(2), 925–938. https://doi.org/10.1016/j.ejor.2023.01.046
18. Bhat, M. S. A., & Sheikh, D. B. A. (2024). Impact of Digitization on Human Resources: Challenges and Opportunities. Journal of Production, Operations Management and Economics, 42, 1–7. https://doi.org/10.55529/jpome.42.1.7
19. Bondar, A., Bilyk, M., Symonov, V., Slavkova, O., & Tolchieva, H. (2024). The Role of Digitization in Management and Strategic Decision-Making in Modern Management. Financial and Credit Activity Problems of Theory and Practice, 2(55), 214–227. https://doi.org/10.55643/fcaptp.2.55.2024.4349
20. Calvetti, D., Chichorro Gonçalves, M., Mêda, P., & Sousa, H. (2020). Worker 4.0: The Future of Censored Construction Sites. Buildings, 10(10), 169. https://doi.org/10.3390/buildings10100169
21. Chan, D. W. M., Olawumi, T. O., & Ho, A. M. L. (2019). Critical success factors for building information modelling (BIM) implementation in Hong Kong. Engineering, Construction and Architectural Management, 26(9), 1838–1854. https://doi.org/10.1108/ecam-05-2018-0204
22. Chen, H. T. (2015). Practical Program Evaluation: Theory-Driven Evaluation and the Integrated Evaluation Perspective. Sage. https://doi.org/10.4135/9781071909850
23. Chipato, N. (2016). Organisational learning and monitoring and evaluation in project-based organisations. Stellenbosch: Stellenbosch University.30 Performance management and measurement.
24. Chipato, N. (2016). Organisational Learning and Monitoring and Evaluation in Project-Based Organisations. Stellenbosch University, Stellenbosch.
25. Dahalan, N. H., Rahman, R. A., Hassan, S. H., & Ahmad, S. W. (2023). Performance indicators for public evaluation of environmental management plan implementation in highway construction projects. International Journal of Disaster Resilience in the Built Environment, 15(3), 425–449. https://doi.org/10.1108/ijdrbe-02-2023-0025
26. Dombrowski, S. C., J Mcgill, R., Farmer, R. L., Kranzler, J. H., & Canivez, G. L. (2021). Beyond the Rhetoric of Evidence-Based Assessment: A Framework for Critical Thinking in Clinical Practice. School Psychology Review, ahead-of-print(ahead-of-print), 771–784. https://doi.org/10.1080/2372966x.2021.1960126
27. Dong, H., Ceylan, S., Dacre, N., & Baxter, D. (2024). What is Agile Project Management? Developing a New Definition Following a Systematic Literature Review. Project Management Journal, 55(6), 668–688. https://doi.org/10.1177/87569728241254095
28. Dugbartey, A., & Kehinde, O. (2025). Optimizing project delivery through agile methodologies: Balancing speed, collaboration and stakeholder engagement. World Journal of Advanced Research and Reviews, 25(1), 1237–1257. https://doi.org/10.30574/wjarr.2025.25.1.0193
29. Ebekozien, A. (2021). Construction companies' compliance to personal protective equipment on junior staff in Nigeria: issues and solutions. International Journal of Building Pathology and Adaptation, 40(4), 481–498. https://doi.org/10.1108/ijbpa-08-2020-0067
30. Ebirim, W., Olu-Lawal, K., Montero, D., Ninduwesuor-Ehiobu, N., Ani, E., Usman, F., & Montero, D. (2024). Optimizing energy efficiency in data centre cooling towers through predictive maintenance and project management. World Journal of Advanced Research and Reviews, 21(2), 1782–1790. https://doi.org/10.30574/wjarr.2024.21.2.0619

31. Ebirim, W., Usman, F., Ninduwezuor-Ehiobu, N., Montero, D., Ani, E., & Olu-Lawal, K. (2024). Project Management Strategies for Accelerating Energy Efficiency in Hvac Systems Amidst Climate Change. International Journal of Management & Entrepreneurship Research, 6(3), 512–525. https://doi.org/10.51594/ijmer.v6i3.841
32. Ebm, C., Del Pozo, C., Barbarello, A., Poli, G., & Brusa, S. (2024). Unleashing excellence: using a project management approach to implement a simulation curriculum to improve residents' preparedness effectively. BMC Medical Education, 24(1). https://doi.org/10.1186/s12909-024-05166-y
33. Egbon, T. N. (2024). Application of Agency Theory in Administrative Accountability and Public Service Delivery in Local Government Councils in Delta State. International Journal of Public Administration Studies, 3(2), 125. https://doi.org/10.29103/ijpas.v3i2.13890
34. Eyieyien, O., Ijomah, T., Idemudia, C., & Paul, P. (2024). Advancements in project management methodologies: Integrating agile and waterfall approaches for optimal outcomes. Engineering Science & Technology Journal, 5(7), 2216–2231. https://doi.org/10.51594/estj.v5i7.1312
35. Fonseca, S. S., Piña Ramírez, C., & Benito, P. A. (2024). Digital Horizons in Construction: A Comprehensive System for Excellence in Project Management. Buildings, 14(7), 2228. https://doi.org/10.3390/buildings14072228
36. Frimpong, B. E., Sunindijo, R. Y., & Wang, C. (2020). Towards Improving Performance of the Construction Industry in Ghana: A SWOT Approach. Civil Engineering Dimension, 22(1), 37–46. https://doi.org/10.9744/ced.22.1.37-46
37. Garcés, G., Forcael, E., Osorio, C., Castañeda, K., & Sánchez, O. (2025). Systematic review of Lean Construction: an approach to sustainability and efficiency in construction management. Journal of Infrastructure Preservation and Resilience, 6(1). https://doi.org/10.1186/s43065-025-00119-1
38. Gazi, M. A. I., Al Masud, A., Yusof, M. F., Islam, M. A., Rahman, M. K., & Wang, Q. (2024). Factors affecting the quality of work life for industrial labour force: empirical evidence from a developing country. BMC Psychology, 12(1). https://doi.org/10.1186/s40359-024-02073-1
39. Ghaleb, B. (2024). The Importance of Using SWOT Analysis in Business Success. International Journal of Asian Business and Management, 3(4), 557–564. https://doi.org/10.55927/ijabm.v3i4.10857
40. Ghaly, M., Tantawy, M. A., Elsmadony, A., & Elbeltagi, E. (2024). Integration of Blockchain-Enabled Smart Contracts in Construction: SWOT Framework and Social Network Analysis. Civil Engineering Journal, 10(5), 1662–1697. https://doi.org/10.28991/cej-2024-010-05-020
41. Ghobakhloo, M., Asadi, S., Iranmanesh, M., Foroughi, B., Mubarak, M. F., & Yadegaridehkordi, E. (2023). Intelligent automation implementation and corporate sustainability performance: The enabling role of corporate social responsibility strategy. Technology in Society, 74, 102301. https://doi.org/10.1016/j.techsoc.2023.102301
42. Gong, S., Gao, X., Chen, L., & Li, Z. (2021). Developing a Dynamic Supervision Mechanism to Improve Construction Safety Investment Supervision Efficiency in China: Theoretical Simulation of Evolutionary Game Process. International Journal of Environmental Research and Public Health, 18(7), 3594. https://doi.org/10.3390/ijerph18073594
43. Hamal, M., De Cock Buning, T., Dieleman, M., & De Brouwere, V. (2018). How do accountability problems lead to maternal health inequities? A review of qualitative literature from Indian public sector. Public Health Reviews, 39(1). https://doi.org/10.1186/s40985-018-0081-z
44. Hien, N. N., Long, N. T., Liem, V. T., & Luu, D. X. (2024). Customer Responses to Airline Service Failure: Perspectives from Expectation Disconfirmation Theory. Sage Open, 14(2). https://doi.org/10.1177/21582440241248334
45. Huang, H., Shang, R., Wang, L., & Gong, Y. (2022). Corporate social responsibility and firm value: evidence from Chinese targeted poverty alleviation. Management Decision, 60(12), 3255–3274. https://doi.org/10.1108/md-07-2021-0993
46. Huzooree, G., & Yadav, M. (2025). Sustainable Project Management and Organizational Resilience (pp. 137–172). Igi Global. https://doi.org/10.4018/979-8-3693-8809-9.ch005
47. Ignatius Teye Buertey, J. (2016). Stakeholder Management on Construction Projects: A Key Indicator for Project Success. American Journal of Civil Engineering, 4(4), 117. https://doi.org/10.11648/j.ajce.20160404.11
48. Jankalová, M., & Jankal, R. (2018). Sustainability Assessment According to the Selected Business Excellence Models. Sustainability, 10(10), 3784. https://doi.org/10.3390/su10103784
49. Harris, F., McCaffer, R. & Edum-Fotwe, F. (2013). Modern Construction Management. Wiley. ISSBN 9781118510186
50. J. A. Khan, A. M. Raman, N. Sambamoorthy, and K. Prashanth (2023). Research Methodology (Methods, Approaches and Techniques). doi: 10.59646/methods/040.
51. Kamau, C.G., Mohamed, H.B. (2015). Efficacy of monitoring and evaluation function in achieving

project success in Kenya: a conceptual framework. Sci. J. Bus. Manage. 3(3), 82.

52. Kamau, C. G. & Mohamed, H. B. (2015). Efficacy of monitoring and evaluation function in achieving project success in Kenya: A conceptual framework. Science Journal of Business and Management, 3(3), p. 82, doi: 10.11648/j.sjbm.20150303.14
53. Kabonga, I. (2019). Principles and Practice of Monitoring and Evaluation: A Paraphernalia for Effective Development. Africanus: Journal of Development Studies, 48(2). https://doi.org/10.25159/0304-615x/3086
54. Kang, M., & Sung, M. (2017). How symmetrical employee communication leads to employee engagement and positive employee communication behaviors. Journal of Communication Management, 21(1), 82–102. https://doi.org/10.1108/jcom-04-2016-0026
55. Khodabakhshian, A., Puolitaival, T., & Kestle, L. (2023). Deterministic and Probabilistic Risk Management Approaches in Construction Projects: A Systematic Literature Review and Comparative Analysis. Buildings, 13(5), 1312. https://doi.org/10.3390/buildings13051312
56. Kissi, E., Eluerkeh, K., Aigbavboa, C., Addy, M., & Babon-Ayeng, P. (2024). Project managers' competencies in the era of digitalization: the case of the construction industry. Built Environment Project and Asset Management, 15(1), 165–189. https://doi.org/10.1108/bepam-03-2024-0051
57. Kissi, E., Tannor, R. A., Agyekum, K., Andam, E. T., Baiden, B. K., & Asamoah, G. E. (2019). Impact of project monitoring and evaluation practices on construction project success criteria in Ghana. Built Environment Project and Asset Management, 9(3), 364–382. https://doi.org/10.1108/bepam-11-2018-0135
58. Kitchens, B., Abbasi, A., & Claggett, J. L. (2024). Timely, Granular, and Actionable: Designing a Social Listening Platform for Public Health 3.0. MIS Quarterly, 48(3), 899–930. https://doi.org/10.25300/misq/2023/17381
59. Kportorgbi, H. K., Aboagye-Otchere, F., & Kwakye, T. O. (2024). Ethical decision-making: an interactive model of organizations' ethics systems and decision-makers' financial situation. Journal of Global Responsibility, 16(2). https://doi.org/10.1108/jgr-02-2023-0013
60. Lagos, C. I., & Alarcón, L. F. (2021). Assessing the Relationship between Constraint Management and Schedule Performance in Chilean and Colombian Construction Projects. Journal of Management in Engineering, 37(5). https://doi.org/10.1061/(asce)me.1943-5479.0000942
61. Lan, F., Xu, W., Sun, W., & Zhao, X. (2024). From poverty to prosperity: assessing of sustainable poverty reduction effect of "welfare-to-work" in Chinese counties. Humanities and Social Sciences Communications, 11(1). https://doi.org/10.1057/s41599-024-03267-z
62. Lazari, V., Chassiakos, A., & Karatzas, S. (2024). Multi-Objective Resource-Constrained Scheduling in Large and Repetitive Construction Projects. Algorithms, 17(8), 351. https://doi.org/10.3390/a17080351
63. Lee, D., Lee, D., Lee, M., Kim, M., & Kim, T. (2020). Analytic Hierarchy Process-Based Construction Material Selection for Performance Improvement of Building Construction: The Case of a Concrete System Form. Materials, 13(7), 1738. https://doi.org/10.3390/ma13071738
64. Li, Q., Mahomed, A., Khan, H., & Mohamed, R. (2022). The Effect of Perceived Organizational Support and Employee Care on Turnover Intention and Work Engagement: A Mediated Moderation Model Using Age in the Post Pandemic Period. Sustainability, 14(15), 9125. https://doi.org/10.3390/su14159125
65. Liu, B., Cifuentes-Faura, J., Liu, X., & Ding, C. J. (2024). Towards green governance and real economy development: how digital technology affects health human resource allocation? Applied Economics, 57(21), 2696–2710. https://doi.org/10.1080/00036846.2024.2331033
66. Liu, Z., & Wang, S. P. (2023). Analysing how government spending, incentives, and supply chains affect financial performance in energy poverty alleviation. Environmental Science and Pollution Research International, 31(3), 5001–5012. https://doi.org/10.1007/s11356-023-31133-z
67. M Kabongo, E., Mukumbang, F. C., Delobelle, P., & Nicol, E. (2020). Combining the theory of change and realist evaluation approaches to elicit an initial program theory of the Mom Connect program in South Africa. BMC Medical Research Methodology, 20(1). https://doi.org/10.1186/s12874-020-01164-y
68. Manoharan, K., Dissanayake, P., Pathirana, C., Deegahawature, D., & Silva, R. (2020). Assessment of critical factors influencing the performance of labour in Sri Lankan construction industry. International Journal of Construction Management, 23(1), 144–155. https://doi.org/10.1080/15623599.2020.1854042
69. Medina-Muñoz, R. D., & Medina-Muñoz, D. R. (2019). Corporate social responsibility for poverty alleviation: An integrated research framework. Business Ethics: A European Review, 29(1), 3–19. https://doi.org/10.1111/beer.12248
70. Menon, S. (2024). Best Practices and Implementation Challenges in Effective Project Management.

International Business Research, 17(2), 66. https://doi.org/10.5539/ibr.v17n2p66

71. Mi, Z., & Li, J. (2024). Maximizing project efficiency and collaboration in construction management through building information modeling (BIM). Applied and Computational Engineering, 72(1), 24–29. https://doi.org/10.54254/2755-2721/72/20240986
72. Moradi, S., Kähkönen, K., & Aaltonen, K. (2020). Comparison of research and industry views on project managers' competencies. International Journal of Managing Projects in Business, 13(3), 543–572. https://doi.org/10.1108/ijmpb-04-2019-0085
73. Mustafa, B., & Lleshi, S. (2024). The impact of lifelong learning and investments in employee development on employee productivity and performance. Multidisciplinary Reviews, 7(8), 2024175. https://doi.org/10.31893/multirev.2024175
74. Mwangu, A. W. & Iravo, M. A. (2015). How monitoring and evaluation affects the outcome of Constituency Development Fund projects in Kenya: A case study of projects in Gatanga Constituency. International Journal of Academic Research in Business and Social Sciences, 5(3), doi:10.6007/IJARBSS/v5-i3/1491.
75. Njama, A. W. (2015). Determinants of effectiveness of a monitoring and evaluation system for projects: A case of Amref Kenya WASH programme. Nairobi: University of Nairobi.
76. Naji, K. K., Al-Qahtani, A. H., Al-Hababi, H., Alhenzab, F. H., & Gunduz, M. (2024). A Systematic Review of the Digital Transformation of the Building Construction Industry. IEEE Access, 12, 31461–31487. https://doi.org/10.1109/access.2024.3365934
77. Nguyen, T. A., Tran, T. V., & Nguyen, T. A. (2024). Building Information Modelling (BIM) for Construction Project Schedule Management: A Review. Engineering, Technology & Applied Science Research, 14(2), 13133–13142. https://doi.org/10.48084/etasr.6834
78. Nuako, F., Adusei, T., & Ghansah, F. A. (2024). Critical success factors for cost overrun minimization in public construction projects in developing countries: the case of Ghana. Construction Innovation. https://doi.org/10.1108/ci-07-2022-0176
79. Nuche, A., Sy, O., & Carlos Rodriguez, J. (2024). Optimizing Efficiency Through Sustainable Strategies: The Role of Management and Monitoring in Achieving Goals. APTISI Transactions on Management (ATM), 8(2), 167–174. https://doi.org/10.33050/atm.v8i2.2257
80. Nwaogu, J. M., Hon, C. K. H., Darko, A., & Chan, A. P. C. (2019). Review of global mental health research in the construction industry. Engineering, Construction and Architectural Management, 27(2), 385–410. https://doi.org/10.1108/ecam-02-2019-0114
81. Ovcina, A., & Arslanagic-Kalajdzic, M. (2024). The Role of Monitoring and Evaluation and Project Implementation Management System for Non-Profit Project Performance in Developing Countries. South East European Journal of Economics and Business, 19(1), 63–76. https://doi.org/10.2478/jeb-2024-0005
82. Omonyo, A. B. (2015). Lectures in project monitoring & evaluation for professional practitioners. Germany: Lambert Academic Publishing.
83. Polat, F., & Demirkesen, S. (2024). Measuring the impact of lean implementation on BIM and project success: case of construction firms. Engineering, Construction and Architectural Management. https://doi.org/10.1108/ecam-02-2024-0204
84. Qureshi, A. H., Alzubi, K. M., Alawag, A. M., Saad, S., Alaloul, W. S., & Manzoor, B. (2021). Implementation Challenges of Automated Construction Progress Monitoring Under Industry 4.0 Framework Towards Sustainable Construction. 322–326. https://doi.org/10.1109/ieeeconf53624.2021.9668074
85. Rahman, M. M. (2021). Achieving Sustainable Development Goals of Agenda 2030 in Bangladesh: the crossroad of the governance and performance. Public Administration and Policy, 24(2), 195–211. https://doi.org/10.1108/pap-12-2020-0056
86. Rehan, A., Thorpe, D., & Heravi, A. (2024). An Empirical Study on Project Managers' Leadership Behavioral Practices Impacting Project Success – The Australian Construction Sector. International Journal of Construction Education and Research, 21(2), 164–188. https://doi.org/10.1080/15578771.2024.2359378
87. Riau, D., Diana, B. A., Akadira, T., Junaidi, J., Muhtarom, M., & Madya, F. (2024). Solving Construction Project Delays as SDGS: Evidence from Indonesia. Journal of Lifestyle and SDGs Review, 4(1), e01638. https://doi.org/10.47172/2965-730x.sdgsreview.v4.n00.pe01638
88. Rony, M. K. K., Akter, K., Debnath, M., Rahman, M. M., Johra, F. T., Akter, F., Chandra Das, D., Mondal, S., Das, M., Uddin, M. J., Rina Parvin, M., & Rina Parvin, M. (2024). Strengths, weaknesses, opportunities and threats (SWOT) analysis of artificial intelligence adoption in nursing care. Journal of Medicine, Surgery, and Public Health, 3, 100113. https://doi.org/10.1016/j.glmedi.2024.100113
89. Rumanti, A. A., Reynaldo, R., Rizana, A. F., & Ramadhan, F. (2021). The Impact of Open Innovation Preparation on Organizational Performance: A Systematic Literature Review. IEEE Access, 9, 126952–126966. https://doi.org/10.1109/access.2021.3111091

90. Sagharidooz, M., De-Almeida-E-Pais, J. E., Soltanali, H., Farinha, J. T., & Raposo, H. D. N. (2024). Reliability, Availability, and Maintainability Assessment-Based Sustainability-Informed Maintenance Optimization in Power Transmission Networks. Sustainability, 16(15), 6489. https://doi.org/10.3390/su16156489
91. Sajjad, M., Alsulamy, S. H., Waqar, A., Falqi, I. I., Alshehri, A. M., Bageis, A. S., & Hu, A. (2023). Evaluation of the Success of Industry 4.0 Digitalization Practices for Sustainable Construction Management: Chinese Construction Industry. Buildings, 13(7), 1668. https://doi.org/10.3390/buildings13071668
92. Salzano, A., Zitiello, E. P., Nicolella, M., & Cascone, S. (2024). Construction Safety and Efficiency: Integrating Building Information Modeling into Risk Management and Project Execution. Sustainability, 16(10), 4094. https://doi.org/10.3390/su16104094
93. Sohal, A., Bartram, T., Stanton, P., Bamber, G. J., Vasquez, T., & De Vass, T. (2022). Success factors for lean six sigma projects in healthcare. Journal of Management Control, 33(2), 215–240. https://doi.org/10.1007/s00187-022-00336-9
94. Sposito, L., Scafuto, I. C., Serra, F. R., & Ferreira, M. P. (2023). Influence of the project managers' expertise and experience in the success of projects: the moderating effect of emotional intelligence. International Journal of Managing Projects in Business, 17(1), 1–26. https://doi.org/10.1108/ijmpb-06-2023-0129
95. Sreedharan V, R., & Sunder M, V. (2018). A novel approach to lean six sigma project management: a conceptual framework and empirical application. Production Planning & Control, 29(11), 895–907. https://doi.org/10.1080/09537287.2018.1492042
96. Tapera, R., Zetola, N. M., Lord, A., Mhaka-Mutepfa, M., Phaladze, N. A., & Mbongwe, B. (2020). The theory of planned behavior as a behavior change model for tobacco control strategies among adolescents in Botswana. PLOS ONE, 15(6), e0233462. https://doi.org/10.1371/journal.pone.0233462
97. Tasheva, Z., & Karpovich, V. (2024). Supercharge Human Potential Through Ai to Increase Productivity the Workforce in the Companies. American Journal of Applied Science and Technology, 4(2), 24–29. https://doi.org/10.37547/ajast/volume04issue02-05
98. Tengan, C. & Aigbavboa, C. (2016). Evaluating barriers to effective implementation of project monitoring and evaluation in the Ghanaian construction industry. Procedia Engineering, 164, pp. 389–394, doi: 10.1016/j.proeng.2016.11.635.
99. Teasdale, R. M. (2021). Evaluative Criteria: An Integrated Model of Domains and Sources. American Journal of Evaluation, 42(3), 354–376. https://doi.org/10.1177/1098214020955226
100. Tengan, C., & Aigbavboa, C. (2018). Validating factors influencing monitoring and evaluation in the Ghanaian construction industry: a Delphi study approach. International Journal of Construction Management, 21(3), 223–234. https://doi.org/10.1080/15623599.2018.1512353
101. Umar, M., Okwandu, A., & Akande, D. (2024). Impact of effective schedule management on high-rise building projects. International Journal of Applied Research in Social Sciences, 6(7), 1371–1386. https://doi.org/10.51594/ijarss.v6i7.1298
102. Varajão, J., & Trigo, A. (2024). Assessing IT Project Success: Perception vs. Reality. Queue, 22(4), 34–53. https://doi.org/10.1145/3687999
103. Wiefek, J., Nagy, E., & Schäfer, M. (2024). Formative evaluation of transdisciplinary research for systematic impact orientation in real-world laboratories. GAIA - Ecological Perspectives for Science and Society, 33(1), 94–101. https://doi.org/10.14512/gaia.33.s1.14
104. Yadhukrishnan, A.V. & Shetty, A. (2015). A review on GIS-based construction project management. International Advanced Research Journal in Science, Engineering and Technology, 2(6), pp. 137–141.
105. Yu, W.-D., Chang, Y.-H., Ho, W.-C., & Cheng, S.-T. (2018). Measuring the Sustainability of Construction Projects throughout Their Lifecycle: A Taiwan Lesson. Sustainability, 10(5), 1523. https://doi.org/10.3390/su10051523
106. Zangana, H. M., Bazeed, S. M. S., Ali, N. Y., & Abdullah, D. T. (2024). Navigating Project Change: A Comprehensive Review of Change Management Strategies and Practices. Indonesian Journal of Education and Social Sciences, 3(2), 166–179. https://doi.org/10.56916/ijess.v3i2.735