

The Impact of Human Resource Management Practices on Project Manager Performance in Construction Projects

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Abstract

Practices of Human Resource Management (HRM) are critical of the performance of employees with specific consideration on the project-based industries like construction. The role of Project Managers entails coordination of the use of resources, risk management and making sure that the project objectives are attained within the timeline, cost and quality limits. Nonetheless, poor HRM practices can influence their work and the general outcomes of the project adversely. The study focuses on exploring the application of HRM practices and how effective they are among the Project Managers in the Malaysian Building construction industry and suggest ways in which the practices can be improved. A structured questionnaire was used to conduct a quantitative research approach involving the Project Managers of G7 contractor companies at Kuala Lumpur. 125 responses (represent 27.77% response rate) were analyzed using descriptive statistics. The results show that HRM practices such as Recruitment and Selection, Training and Development, Performance Appraisal, and Compensation and Rewards are highly practiced and are rated as effective in facilitating the performance of the Project Manager. Training and development were identified to be the best practice among them. The strategies to improve the effectiveness of key HRM practices among Project Manager are transparent recruitment systems, continuous professional development, reward systems based on performance and strategic HRM integration. The research concludes that appropriate HRM practices that are well coordinated and aligned are essential in increasing performance of Project Managers and ensuring the construction project is more successful, while guiding construction organizations on how to strengthen the HR systems.

1. Introduction

The construction industry is a project-based sector that relies heavily on effective human resource management (HRM) practices to ensure successful project delivery. Construction projects are typically complex, time-bound, and involve multiple stakeholders, making the management of human resources a critical factor in achieving project objectives. Project Managers play a central role in coordinating project activities, managing

teams, and ensuring that projects are completed within the constraints of time, cost, and quality (Kerzner, 2017). As construction projects become increasingly complex due to technological advancement, regulatory requirements, and rising stakeholder expectations, the performance of Project Managers has emerged as one of the key determinants of overall project success (Turner, 2014).

HRM practices such as recruitment and selection, training and development, performance appraisal, and compensation and rewards are essential tools in shaping employees' capabilities, motivation, and performance (Armstrong & Taylor, 2020). Effective HRM practices enable organizations to attract competent personnel, enhance skills and knowledge, and retain experienced professionals. However, the application of HRM practices within the construction industry is often inconsistent and insufficiently aligned with project-based work environments, which may negatively affect Project Manager performance and project outcomes (Loosemore, Dainty, & Lingard, 2003). Thus, this study examines the implementation and effectiveness of HRM practices among Project Managers in the Malaysian construction industry and proposes strategies to improve HRM effectiveness in supporting project performance.

The construction industry is one of the key contributors to Malaysia's economic development and plays a significant role in infrastructure growth and employment generation as shown in Appendix C. Construction projects are typically carried out in dynamic and uncertain environments, requiring effective coordination of resources, stakeholders, and activities (Ofori, 2015). In this context, Project Managers are responsible for planning, organizing, and controlling project execution to ensure successful project completion in terms of schedule, budget, quality, and workforce management (PMI, 2021). As project complexity increases, the competence and performance of Project Managers have become increasingly critical to project success.

Human Resource Management practices, including recruitment and selection, training and development, performance appraisal, and compensation and rewards, play a vital role in influencing employee performance and organizational effectiveness (Boxall, Purcell, & Wright, 2007) as shown in Appendix B. Proper HRM practices help organizations recruit qualified employees, develop skills, motivate performance, and retain talent. However, within the construction industry, HRM practices are often applied inconsistently and are not sufficiently tailored to the project-based nature of construction work (Loosemore *et al.*, 2003). This misalignment has been associated with issues such as low productivity, skill shortages, and high employee turnover, which ultimately affect Project Manager performance and project success.

Despite the recognized importance of HRM practices, many construction organizations continue to prioritize technical and operational aspects of project management while paying limited attention to strategic HRM implementation. Inadequate recruitment processes, insufficient training and development programs, ineffective performance appraisal systems, and poorly structured reward mechanisms can reduce Project Manager motivation and performance, thereby adversely affecting project outcomes (Armstrong & Taylor, 2020; Turner, 2014). Furthermore, the project-based nature of construction work poses additional challenges in implementing consistent and effective HRM practices across different projects (PMI, 2021).

As a result, there is a lack of empirical understanding regarding the current level of HRM practice implementation and their effectiveness in supporting Project Manager performance within the Malaysian construction industry. Therefore, it is necessary to investigate the existing HRM practices applied to Project Managers and assess their effectiveness, as well as to identify strategies that can enhance HRM practices to improve Project Manager performance and overall project success

2. Literature Review

This section is a review of applicable literature on Human Resource Management (HRM) practices and how it affects performance of Project Managers in the construction industry. The review aims to consider the role of HRM in project-based organizations, connection between key HRM practices and employee performance, identification of research gaps that warrant the current study.

2.1 The Malaysian Construction Context and Project Manager Role

Malaysian construction industry is a leading sector of the socio-economic development of the country that generates a substantial contribution to GDP and infrastructural development (CIDB, 2021). Being the economic capital of the country, Kuala Lumpur concentrates most of the large and complicated constructive projects requiring advanced skills in project management (InvestKL, 2022). The Project Managers working in such a challenging setting are key to project success as they guide through complicated variables of time, cost, quality, safety, and various stakeholders' interests (PMI, 2021). The complexity of construction project management which involves strict deadline, limited budget, and co-ordination of various disciplines explains the necessity of having highly qualified PMs, who possess not only technical and management skills but also interpersonal skills (Doloi, 2015; Dvir *et al.*, 2018).

(a) Challenges and Demands of Construction Project Management

Problems found in construction project management include unpredictable events, stiff deadlines, small budgets and frequent changes to the project scope (Doloi, 2015). There are additional complications when lots of specialists, suppliers and authorities are part of the process (Ashworth & Perera, 2018). Project Managers have to deal with sudden changes at building sites, varying prices for building materials, limited workforce and strict rules, by being able to solve issues and manage well (Yap *et al.*, 2019; Livesey, 2016).

(b) Key Competencies for Effective Construction Project Managers

To overcome these obstacles, construction Project Managers should have technical, managerial and interpersonal abilities (Dvir *et al.*, 2018). To have technical skills, project manager need to know about construction, handle contracts, calculate costs, organize schedules and check for quality (Sunindijo, 2015). Managers use planning, risk management and decision-making as their main skills. To engage with stakeholders well, it is important to learn leadership, communication, negotiation and teamwork skills (Kerzner, 2025; Ramazani & Jergeas, 2015; Ling *et al.*, 2018).

(c) Defining and Measuring Project Manager Performance

A project's success as measured by time, cost and quality is generally linked to the personal work of its project manager (PMI, 2021). On the other hand, stakeholder happiness, how well health and safety are managed and sustainability are also key concepts in today's view (Ershadi *et al.*, 2020). Considering leadership, teamwork management and being ethical are ways individuals can influence their performance as Project Managers (Müller & Turner, 2017).

2.2 Human Resource Management in the Project Oriented Construction Sector

Human Resource Management refers to a set of practices designed to efficiently manage the workforce in an organization to help an organization to accomplish its goals (Noe *et al.*, 2020). Within the framework of the project-oriented organization (POOs) such as construction companies, HRM acquires a different flavor because of the temporal nature of projects, the mythical character of project teams, and the career development requirements of project members (Bredin & Soderlund, 2011, 2015). Strategic Human Resource Management (SHRM) goes even further, stating that those HRM practices should be connected to the overarching business strategy in order to achieve a competitive edge, which, in the case of construction firms, means that project managers should have the skills and the drive to succeed in delivering projects (Boselie, 2019). Construction sector introduces some unique challenges to HRM, among which are talent retention in the project-based employment environment, guaranteeing permanent skill progression, and performance and reward management across a variety of projects and frequently scattered geographically (Enshassi *et al.*, 2016; Lingard & Oswald, 2017).

2.3 Key HRM Practices Under Investigation

Effective approaches to management through HRM help strengthen Project Managers' abilities and attitude which directly influences their results. The core practices and their value are featured in Table 1.

Table 1: HRM Practices Interconnection with the Relevance of Project Manager Performance

HRM Practices	Description and Relevance to Project Manager Performance	Key Citations
Recruitment and Selection	Attracting and choosing suitable candidates with the right mix of technical knowledge, managerial capabilities, and interpersonal skills essential for leading construction projects effectively.	Armstrong & Taylor, 2020; Ahmadi Eftekhari <i>et al.</i> , 2022; Moon <i>et al.</i> , 2018
Training and Development	Equipping Project Managers with skills for current and future roles, focusing on areas like advanced project planning, risk management, leadership, and new technologies to enhance capabilities and project outcomes.	Noe <i>et al.</i> , 2020; Ramazani & Jergeas, 2015; Ling <i>et al.</i> , 2018

Performance Appraisal	Evaluating Project Manager performance against project-specific objectives and identifying areas for improvement. Tailored, regular, and constructive feedback is crucial in the dynamic project environment.	Armstrong & Taylor, 2020; Müller & Turner, 2017; Huemann, 2015
Compensation and Rewards	Utilizing financial (e.g., base pay, project-linked bonuses) and non-financial incentives to motivate Project Managers, ensure fairness, and retain talent by recognizing contributions to project success.	Noe et al., 2020; Scott, 2016; Urazova, 2023

2.4 Synthesizing the HRM-Performance Link for Project Managers

As the previous review of main HRM principles showed why they influence the performance of a Project Manager. A good way to grasp this relationship is to reflect on the scientific proof for the links and the importance of a well-managed approach to HRM in construction project management.

2.4.1 Empirical Evidence on HRM Practices and Project Manager Performance

It is now widely acknowledged, based on studies, that handling HRM skills successfully benefits a project's main management capability and increases the chances of a positive outcome for construction projects. Results from recent evidence suggest that good HR management helps project managers succeed and also results in better success rates for construction projects. Research investigations consistently find that recruiting and choosing Project Managers with precise technical know-how and good social skills leads to more successful projects (Moon *et al.*, 2018). Just as project managers benefit from courses designed for their field such training programs are usual connected to more advanced leadership, better risk management and higher achievement in tough construction projects (Ramazani & Jergeas, 2015; Ling *et al.*, 2018).

Also, when performance appraisal gives useful and related feedback regarding a project manager's project duties, motivation and goal achievement increase (Kerzner, 2025). In addition, systems for pay and rewards that are fair, open and productive have been found to keep talented PMs in the organization (Zainal *et al.*, 2022 and Urazova, 2023). Based on this body of research, it is clear that applying strong HRM processes in acquiring, developing, motivating and retaining PM talent is very important for project success.

2.4.2 The Importance of Strategic HRM Approach for Project Managers

Applying different HRM practices together helps much more than applying each one alone, mainly in contexts where projects guide the organization, as in construction. According to Boselie (2019), the true impact of HRM becomes clear when its activities are seen as parts of one connected approach in an organization. It means project managers must see to it that recruitment and selection, training and development, performance appraisal and compensation and rewards all work together and are in line.

To complete this alignment, the skills picked during recruitment and selection must be clearly part of the training and development programs curriculum. As a result, evaluation systems ought to examine both the mentioned abilities and achievements in completing project tasks. The conclusions from these appraisals ought to support additional career development efforts and relate to how pay is awarded, encouraging people to keep performing how the company wants. If HRM is done this way, all practices are directly linked to construction projects and the main strategic priorities of the company. It makes HRM key to strategic goals and allows it to assist project managers which gives the company an advantage over others using its best available resources in construction.

2.5 Current Implementation of Key HRM Practices among Project Manager in Construction Project

The following section is a literature review relating to the first research objective: To identify current implementation level of key HRM practices among Project Manager in construction project. Regarding implementation of these best HRM practices of PMs in the construction industry, literature indicates that there are differences, and in many instances, there are disparities between what should be based on theory and what is practiced in real sense.

2.5.1 Current Implementation of Recruitment and Selection

Although the ideal scenario is that the organizations seek to recruit project managers with a balanced set of technical, managerial, and interpersonal skills (Ahmadi Eftekhari *et al.*, 2022), the current practice is often biased toward recruiting individuals with strong technical competencies at the expense of ignoring the importance of soft skills. Even the challenges have been struggling to ensure that they attract candidates who possess holistic competencies that indeed fit in the complexity of the demands of complex construction projects (Ahsan, Ho, & Khan, 2013). The systematic use of structural competency frameworks and the application of diverse sourcing strategies are approved but not necessarily consistently applied throughout the industry (Moon *et al.*, 2018).

2.5.2 Current Implementation of Training and Development

The necessity of specialized and constant training of project managers is widely acknowledged and exists; emerging topics and techniques, like Building Information Modeling (BIM), lean construction ideologies, advanced contract law, advanced risk management procedures, and dynamic leadership qualities require regular and in-depth training of project managers (Noe *et al.*, 2020). Nevertheless, the current literature shows that companies may be inconsistent or even sporadic in organizational investment in such focused and specific training. Other companies might underestimate the importance of a continuous professional growth that goes beyond the initial certifications, or the basic project management courses, and might potentially result in the emergence of critical skill gaps further down the line, particularly as the complexity of the projects grows (Ramazani & Jergeas, 2015; Ling *et al.*, 2018).

2.5.3 Current Implementation of Performance Appraisal

Project-related objectives must align with performance appraisal schemes, have a reasonable timing, and offer practical, positive feedback (Armstrong & Taylor, 2020). In practice however, numerous construction companies are still said to be using generic appraisal systems, usually annual. These systems often fail to both capture and recognize the contextual peculiarities of challenges, individual contributions, and intricate accomplishments of project managers in the dynamic life of a project. It may result in the project manager dissatisfaction, the sense of injustice, and, most importantly, the failure to receive targeted development and skills improvement (Muller and Turner, 2017; Huemann, 2015).

2.5.4 Current Implementation of Compensation and Rewards

The project managers in the construction sector are normally compensated through a combination of a base salary which may or may not be accompanied by project-based bonuses or rewards (Scott, 2016). The literature is unanimous about the significant importance of coming up with fair, transparent and motivating reward systems that are aligned to individual as well as project performance. However, de facto incongruences with respect to unequivocally attaching rewards to objective project performance variables or a lack of focus on holistic non-monetary rewards (including recognition, complex tasks, or career development opportunities), however, can have an adverse influence on project manager motivation, job satisfaction, and retention in organizations over time (Zainal *et al.*, 2022; Urazova, 2023).

2.6 Effect of Key HRM Practices among Project Manager in Construction Project

In this section, the literature related to the second research objective will be reviewed: To identify the effectiveness of key HRM practices among Project Manager in construction project. The literature has substantial evidence regarding the optimistic outcome of properly applied HRM practices on project manager performance and subsequently, the project success.

2.6.1 Effectiveness of Recruitment and Selection

Careful selection of project managers with the appropriate set of competencies directly and provided impact on the quality of project implementation and realization of the desired results. With a set of suitable skills and qualities, project managers are much better prepared to guide diverse teams, manage the complexity of projects with more confidence, and make adequate strategic decisions (Boselie, 2019; PMI, 2021).

2.6.2 Effectiveness of Training and Development

A key part of Strategic investment in specific project manager training and development initiatives offers significant returns, as project managers grow in leadership strengths, the ability to make better decisions in pressurized situations, stronger risk prevention plans, and capabilities to take on more innovative or otherwise demanding construction projects and complete them satisfactorily. This kind of development is related not only

to the personal growth of project manager and the advancement of his or her career but also to the technical and managerial capability of the entire construction organization (Ramazani & Jergeas, 2015; Ling *et al.*, 2018; Tabassi *et al.*, 2016).

2.6.3 Effectiveness of Performance Appraisal

Project manager motivation, the better alignment of individual efforts with higher organizational goals, and actual improvement of overall performance are closely connected with implementation of clear, fair, and developmentally oriented performance appraisal systems. Effective systems of constructive feedback play a crucial role in ensuring that project managers recognize the aspects of their professional development, perfect their craft and, thus, improve the level of their work on projects (Bratton & Gold, 2017; Anagnostou & Albani, 2021).

2.6.4 Effectiveness of Compensation and Rewards

Fair and actually inspiring structures of compensation and rewards are extremely essential in nurturing project manager job fulfillment, firm commitment, and retention of talents. The systems that clearly and reliably connect rewards, both financial and non-financial, to the defined performance indicators and objectively measurable project success are also more likely to motivate project managers to work harder, put more effort and effort into their work, and feel more loyal to the organization (Scott, 2016; Urazova, 2023; Park & Lee, 2018).

2.7 Strategies to Improve the Effectiveness of Key HRM Practices among Project Manager in Construction Project

The present section provides the review of the literature that is pertinent to the third research objective: To suggest the strategies to improve the effectiveness of key HRM practices among Project Manager in construction project. In order to make HRM practices employed on behalf of project managers in the challenging construction setting more effective, the existing body of knowledge proposes a few substantiated strategic options.

2.7.1 Strategies Involved with Recruitment and Selection

Organizations should be encouraged to take a systems approach to recruitment by ensuring that the technical, managerial, and inter-personal acumen needed to perform project manager successfully is clearly defined. Diverse sourcing such as through industry-specific networks, well-established recruitment firms, and internal talent pools and the implementation of a well-organized interview process, behavioral tests, and established psychometric instruments may substantially enhance the quality of project manager selection and the alignment between the talent and the requirement of the position (Ahmadi Eftekhari *et al.*, 2022; Moon *et al.*, 2018).

2.7.2 Strategies Involved with Training and Development

The most important is to establish and adopt continuous and well-organized professional development programs. This entails creating official mentorship programs that match senior project managers with junior project managers, and provision of active assistance to project managers in achieving higher professional qualifications such as PMP, CIOB qualifications or technical expertise qualifications. The content of training programs also needs to be reviewed and renovated on a regular basis, with an emphasis on not only the latest technical expertise such as BIM expertise, lean construction techniques, sustainable building processes, and state-of-the-art contract management but also the fundamental soft skills, such as leadership, strategic communication, negotiation, and conflict management and stakeholder management (Shafii & Bahaudin, 2019; Sunindijo, 2015).

2.7.3 Strategies Involved with Performance Appraisal

There is a change required towards the creation of project-based Key Performance Indicators (KPIs) that are much more accurate in terms of capturing the contributions and challenges faced by the project manager in specific project environments. It is possible to include the elements of multi-rater or 360-degree feedback mechanisms to have a more comprehensive picture of performance. More important, organizations are encouraged to provide constant or frequent feedback and progress evaluation meetings during the project lifecycle instead of depending on occasional, formal annual reviews, thus, ensuring that the appraisal exercise is more timely, pertinent, and developmental to project managers (Huemann, 2015; Ingason & Jonson, 2009).

2.7.4 Strategies Involved with Compensation and Rewards

The best strategy is to design open and fair reward systems. This entailed a clear correlation of the monetary bonuses and incentives to the attainment of certain project milestones, success metrics of the project (time, cost, quality, safety) as well as the contribution of the individual performances. In addition to the monetary compensation, non-financial rewards, including formal recognition programs, the possibilities to be involved in high-profile or challenging tasks, clear career advancement pathways, and the enhanced autonomous may act as highly effective triggers of project manager motivation, engagement, and long-term organizational loyalty (Meng & Sarnell, 2019; Park & Lee, 2018). Also, the most general strategy, noted in literature, is the development of a positive and strengthening organizational culture. Among others, this involves the encouragement of open communication channels, appreciation of the role project managers plays, as well as the establishment of a strategic alliance between the HR department and the project operational units to meet the human capital requirement of projects in a joint manner (Loosemore, Dainty, & Lingard, 2003; Turner *et al.*, 2016).

3. Research Methodology

3.1 Research Design

The research methodology section contains all the essential instructions for getting the study's results. The research methodology clearly explains every step, strategy and choice in the process. The method used for the study should be clearly explained to guarantee that the research is simple, reliable and repeatable. In this chapter, the author presents the plan of study, the methods used, who was included in the study, how participants were chosen, how the data was collected, the analysis process and the measures taken for ethics.

3.2 Research Design

The purpose of this study was to analyze how HRM influences the performance of project managers in the construction industry of Malaysia, mainly in Kuala Lumpur, through a descriptive survey. Since the purpose is to describe clearly how well crucial Human Resource Management practices are used and what impacts they have, it is best to use a descriptive design (Creswell & Creswell, 2018; Nassaji, 2015). By using this design, researcher would be able to collect in-depth information from a selection of Project Managers for the first two research objectives. Most of the approach would center on quantitative research methods. The advantage is that this way, we can represent variables as numbers and carefully analyze them to detect patterns, connections or patterns (Apuke, 2017). Applying the quantitative method helps gather data from a wider population which improves the chances of results applying to many companies.

3.3 Research Approach and Instrument

One of the main methods for collecting data would be with a structured survey questionnaire. This method is applied since it gathers consistent data on perception and practices from Project Managers spread all over the country (Rea & Parker, 2014). The duty would be to carefully develop and separate the questionnaire into crucial sections. Researcher would gather their education, years of work experience, the project type they manage most, employers, company size and present position from respondents under Section A. It is necessary to collect this information to shape the study and create useful comparisons within certain groups.

Table 2: *Structure and Content Focus of the Questionnaire*

Section	Title/Focus	Description of Content	Type of Data Collected
A	Demographic	Education, Years of Work Experiences, etc.	Nominal/Ordinal
B	Implementation Level of Key HRM Practices	Key HRM Practices (Recruitment & Selection, Training & Development, Performance Appraisal and Compensation & Rewards)	Ordinal (Likert Scales)
C	Perceived Effectiveness of Key HRM Practices	Perceptions of how effective key HRM practices are influencing their performance as project managers.	Ordinal (Likert Scales)

In Sections B and C, participants are expected to reply using a 5-point Likert scale. Lots of people use these scales to study attitudes and perceptions since they provide numerical information (Joshi *et al.*, 2015). The Likert scales are explained in Table 3.

Table 3: *Likert Scales Anchors used in the Questionnaire (Source: Joshi et al., 2015)*

Scale Value	1	2	3	4	5
Section B: Implementation	Not Implemented	Minimal Implemented	Neutral	Substantially Implemented	Highly Implemented
Section C: Effectiveness	Not Effective	Minimal Effective	Neutral	Substantially Effective	Highly Effective

Section B is intended to find out the extent to which main HR practices are implemented in a company must ensure recruitment and selection, training and development, performance appraisal and offer compensation and rewards to its employees. Respondents taking part in the survey was asked to indicate how much their organizations apply certain HRM practices by choosing from a 5-point scale ranging from 1 to 5. Questions in Section C examine the way these HRM practices impact the performance of Project Managers. A Likert scale was applied with grades starting at 1 (for “Not Effective”) and going up to 5 (for “Highly Effective”). Because Likert scales supply quantitative results, they are popular for measuring attitudes and thoughts in psychology (Joshi *et al.*, 2015).

3.4 Data Collection Methods

(a) Primary Data

Primary data played the most important role in providing information for the research objectives. This information was gathered only from the administration of the mentioned structured survey questionnaire. The Google Forms platform and similar online tools were primarily used to distribute the questionnaire for maximum reach, efficiency and to make it easy for participants to take (Evans & Mathur, 2018). People were informed about the study through the right professional groups, social networks and mailing lists.

(b) Secondary Data

Secondary data supported and contributed to the study’s results. The study required examining academic articles in peer-reviewed journals, industry reports from CIDB Malaysia, REHDA Malaysia and DOSM and relevant books and theses that were created in the past ten years. The gathered data play a role in designing the questionnaire and provide support for this study, help explain the findings from the survey and support the making of recommendations for the last objective.

3.5 Population and Sampling of Respondent

(a) Population size

The researchers focused on project managers who have been involved in or just completed building construction projects that are residential in Kuala Lumpur, Malaysia. Since there are many projects being worked on and many project managers are present in Kuala Lumpur, it is chosen as the study area (InvestKL, 2022). Researcher found project managers with a range of experience and work for companies of all sizes in this population.

According to data reported by the Construction Industry Development Board Malaysia and the Board of Engineers Malaysia, the Malaysian construction industry employed many registered engineers and construction professionals, with a substantial proportion operating within the Klang Valley region, including Kuala Lumpur (CIDB Malaysia & Board of Engineers Malaysia, 2021). Although an exact number of Project Managers working specifically on residential building projects in Kuala Lumpur was not publicly available, industry statistics indicated that the population size could be reasonably estimated to be in the range of several thousand Project Managers. This estimation was based on the number of active residential construction projects, registered contractors, and professional engineers operating in the region as shown in Appendix A. Due to the absence of a comprehensive and up-to-date sampling frame and the continuously changing nature of construction projects and personnel, it was not feasible to accurately identify or enumerate the entire population. Therefore, the population for this study was considered large and indeterminate, which justified the use of non-probability sampling techniques. Non-probability sampling was commonly adopted in construction management and

organizational studies when the target population was large, dynamic, and difficult to access through complete lists (Sekaran & Bougie, 2016). This approach allowed the researcher to collect relevant data from experienced respondents who met the study criteria while maintaining practicality and efficiency.

(b) Sampling Size & Sampling Technique

This study applied non-probability sampling because the sampling frame for Project Managers in Kuala Lumpur's building construction sector is incomplete (Taherdoost, 2016). Beginning with convenience sampling, the basic approach gathered project managers by contacting them within the community and on online sites (Etikan, 2016). The next stage, called snowball sampling, relied on having the initial participants recommend other eligible project managers for the project (Naderifar *et al.* 2017). Such an approach tries to ensure equal representation. In this study, the researcher aims to get at least 100 and at most 150 completed questionnaires. Kumar and Taherdoost (2019, 2017) have shown that 50 and more internal responses to any question are sufficient to perform descriptive statistics and reliability tests in an exploratory survey.

3.6 Data Analysis

Once the questionnaires are collected, all the quantitative data is thoroughly organized and analyzed by SPSS or its equivalent and it would be presented and organized in Microsoft Excel for easy viewing. The method for analyzing data is built to suit the research's objectives which are listed in Table 4.

Table 4 Data Analysis Method

Research Objectives	Data Source(s)	Type of Data	Analytical Tool	Specific Statistical Tests/Analyses
RO1: To identify current implementation level of key HRM practices among Project Managers in construction projects.	Primary Data (Section A, B)	Likert Scale Responses, Demographics	SPSS, Excel	Descriptive Statistics (Frequencies, Percentages, Mean, Standard Deviation)
RO2: To identify the effectiveness of key HRM practices among Project Managers in construction projects.	Primary Data (Section A, C)	Likert Scale Responses, Demographics	SPSS, Excel	Descriptive Statistics
RO3: To suggest strategies to improve the effectiveness of key HRM practices among Project Managers.	Results from RO1 & RO2 and Secondary Data	Quantitative Findings	SPSS, Excel	Integration and Interpretation. Involves comparative analysis where the weaknesses identified from RO1 & RO2.

Before analyzing the data, all the information is checked and corrected for errors, unusual values and missing data points to protect its quality. Frequencies, percentages, average statistics and levels of variation will be determined to describe both the demographic characteristics of respondents and how the HRM practices are carried out. The Likert scales in Sections B and C of the questionnaire was analyzed for consistency and reliability with the help of Cronbach's Alpha coefficient. If a Cronbach's Alpha value is 0.70 or higher, the scale is seen as reliable (Taber, 2018). Strategy development as the third objective will be explored by integrating discoveries from empirical research with knowledge from the various literature sources.

4. Results and Discussion

The section provides the analysis and discussion of the data that was collected through the questionnaire survey of the Project Managers of the construction projects. This section aims to study the demographic of the respondents, survey the implementations and the success of Human Resource Management (HRM) practices as well as strategies to enhance effectiveness of HRM practices in underpinning the performance of the Project

Managers. This piece of research fulfilled the aims of the research by analyzing the data using the descriptive statistics techniques of frequency, percentage, and mean score analysis to meet the goals of the research.

4.1 Data Collection

The data in this research were gathered by a structured online questionnaire which was administered to the Project Managers using professional networks, through industry connections and online channels (Email & WhatsApp). 125 valid answers out of 450 were collected and treated, which was approximately 27.77%. This is said to be sufficient sample size of descriptive analysis within the social science research and meets the recommended minimum required sample sizes of medium effect research (Sekaran and Bougie, 2016; Tabachnick and Fidell, 2007). The online questionnaire was used to secure the broad coverage of the industry and provide anonymity to the respondents and the voluntariness of participation. The purpose of the study was explained to all respondents and guaranteed that the data obtained would only be used in academic purposes.

4.2 Part A: Demographic Information

Table 5 *Respondent's Background*

No	Description	Frequency	Percentage (%)
1	Gender		
	Male	78	62.4
	Female	47	37.6
2	Age		
	Below 25	5	4.0
	25 - 34	60	48.0
	35 - 44	41	32.8
	45 and above	18	14.4
3	Highest Academic Qualification		
	Diploma	13	10.4
	Bachelor's Degree	66	52.8
	Master's Degree	34	27.2
	PhD	12	9.6
4	Years of Experience in Construction Project Management		
	Less than 5 Years	7	5.6
	5 – 10 Years	65	52.0
	11 – 15 Years	34	27.2
	More than 15 Years	18	14.4
5	Job Position		
	Project Manager	111	88.8
	Assistant Project Manager	14	11.2
6	Company Type		
	Local	78	62.4
	International	39	31.2
	Joint Venture	8	6.4
7	Main Type of Projects Involved		
	Residential	72	57.6
	Non-residential	22	17.6
	Civil Engineering	21	16.8
	Infrastructure	9	7.2
	Others (IT, Oil & Gas, Electrical)	3	2.4

This section presents the demographic background of the respondents, which includes gender, age, highest academic qualification, years of experience in construction project management, current job position, company type, and main type of projects involved. Table 5 shows a total of 125 respondents participated in this study. Based on the results, the majority of respondents were male, comprising 78 respondents (62.4%), while female respondents accounted for 47 respondents (37.6%). In terms of age distribution, most respondents were within the 25–34 years age group, representing 60 respondents (48.0%), followed by those aged 35–44 years with 41 respondents (32.8%). Regarding academic qualifications, the majority of respondents held a Bachelor's degree, with 66 respondents (52.8%), followed by Master's degree holders with 34 respondents (27.2%), while smaller proportions possessed a Diploma (10.4%) and PhD (9.6%).

With respect to working experience in construction project management, most respondents had 5–10 years of experience, accounting for 65 respondents (52.0%), followed by those with 11–15 years of experience at 34 respondents (27.2%), while respondents with less than 5 years and more than 15 years of experience represented smaller proportions. In terms of job position, the majority of respondents were Project Managers, comprising 111 respondents (88.8%), indicating that the survey successfully reached the targeted group. Regarding company type, most respondents were employed in local companies (62.4%), followed by international companies (31.2%) and joint venture organizations (6.4%). Lastly, the majority of respondents were involved in residential projects, with 72 respondents (57.6%), followed by non-residential, civil engineering, and infrastructure projects. Overall, the demographic profile indicates that the respondents possess relevant professional roles, experience, and academic backgrounds, supporting the reliability of the data collected for this study.

4.3 Part B: Implementation of HRM Practices

This section explores the extent to which Human Resource Management (HRM) practices are applied in construction-related organizations basing it on the data obtained on 125 Project Managers. They assessed four key areas under the HRM which include Recruitment and selection, Training and Development, Performance appraisal and Compensation and Rewards. The results provide information on maturity, consistency, and organization commitment linked to HRM processes within the Malaysian construction industry. Upon analysis, the level of measurement through the mean range and central tendency level will be referred as the key measurement of the data as shown in Table 6 (Wiersma, 1995).

Table 6 Level of measurement (Wiersma, 1995)

Mean Range	Central Tendency Level
High	3.68-5.00
Moderate	2.34-3.67
Low	1.00-2.33

Table 7 Implementation of HRM Practices

No	Implementation of Recruitment and Selection	Mean	Interpretation	Ranking
1	Clear job descriptions are provided for Project Manager roles	4.33	High	2
2	Clear job requirement is provided for Project Manager roles	4.38	High	1
3	Recruitment processes focus on both technical and managerial skills	4.22	High	4
4	Selection involves structured interviews and fair assessment methods	4.27	High	3
No	Implementation of Training and Development	Mean	Interpretation	Ranking
1	Project Managers receive regular technical training (e.g., project planning, BIM, contract law)	4.10	High	2
2	Leadership development programs are provided	4.19	High	1

3	Soft skills development programs are provided	4.03	High	3
4	Opportunities for professional certification (PMP, CIOB, etc.) are supported	4.00	High	4
No	Implementation of Performance Appraisal	Mean	Interpretation	Ranking
1	Performance reviews are conducted regularly	4.32	High	1
2	Appraisal criteria are clearly linked to project outcomes (time, cost, quality, safety)	4.32	High	1
3	Constructive feedback is provided to help improve performance	4.15	High	2
No	Implementation of Compensation and Rewards	Mean	Interpretation	Ranking
1	Compensation packages are competitive with industry standards	4.35	High	2
2	Bonuses or incentives are given based on project performance	4.23	High	3
3	Non-financial rewards (recognition, career advancement) are available	4.36	High	1

The implementation of Human Resource Management (HRM) practices among construction organizations was analyzed using mean score analysis, as presented in Table 7. Overall, the findings indicate that HRM practices are highly implemented, with all dimensions recording overall mean scores above 4.00. Specifically, recruitment and selection practices achieved an overall mean score of 4.30, indicating strong organizational emphasis on structured hiring processes. Clear job requirements, ranking first on the mean score, which the mean is 4.38 and clear job descriptions ranking second with mean 4.33, were among the highest-rated items, reflecting the importance placed on clarity and transparency in Project Manager recruitment. Similarly, structured interviews and fair assessment methods ranking third with mean 4.27 and recruitment processes that focus on both technical and managerial skills ranking last with mean 4.22 were also highly implemented, suggesting a balanced and systematic approach to candidate selection.

In terms of training and development, the overall mean score of 4.08 indicates a high level of implementation, with leadership development programs ranking first having the mean score of 4.19 and regular technical training ranking second having the mean score of 4.10, being strongly emphasized. Performance appraisal practices also demonstrated a high level of implementation, recording an overall mean score of 4.26, with regular performance reviews and appraisal criteria linked to project outcomes both ranking first achieving mean scores of 4.32. Furthermore, compensation and reward practices recorded the highest overall mean score of 4.31, indicating strong organizational commitment to motivating Project Managers. Non-financial rewards such as recognition and promotion opportunities ranking first having the mean score of 4.36 and competitive compensation packages ranking second having the mean score of 4.35 were particularly well implemented. Overall, the results suggest that construction organizations have established comprehensive and well-structured HRM practices to support Project Manager performance.

4.4 Part C: Effectiveness of HRM Practices

This section examines the opinion of respondents on the effectiveness of four key human resource management (HRM) areas Recruitment and Selection, Training and Development, Performance Appraisal and Compensation and Rewards. Efficacy was measured based on the ability of each HRM practice to facilitate essentially professional performance, growth and motivation of Project Managers. High average scores are viewed as the sign of the increased perceived efficacy to indicate that the appropriate practice has significant importance to organization and project-level outcomes.

The analysis that follows, provides a more subtle insight into whether the HRM practices incorporated in the firms of the respondents achieve their set goals.

Table 8 *Effectiveness of HRM Practices*

No	Effectiveness of HRM Practices	Mean	Interpretation	Ranking
1	Recruitment & Selection contributes to hiring competent Project Managers	4.38	High	4
2	Training & Development improves my skills and career growth.	4.52	High	1
3	Performance Appraisal helps me identify strengths and weaknesses.	4.43	High	3
4	Compensation & Rewards motivate me to perform better.	4.46	High	2

The effectiveness of Human Resource Management (HRM) practices in supporting Project Manager performance was analyzed using mean score analysis, as presented in Table 8. Overall, the findings indicate that HRM practices are perceived to be highly effective, with all practices recording mean scores above 4.30. Among the practices evaluated, Training and Development demonstrated the highest level of effectiveness, achieving a mean score of 4.52, which falls under the very high effectiveness category. This result suggests that respondents strongly believe training initiatives play a critical role in enhancing skills, competencies, and career growth among Project Managers in construction projects. Recruitment and Selection practices also recorded a high level of effectiveness, ranking second with a mean score of 4.38, indicating that structured recruitment processes contribute significantly to hiring competent Project Managers. Similarly, Performance Appraisal was perceived as highly effective, ranking third achieving a mean score of 4.43, reflecting its role in helping Project Managers identify strengths and weaknesses and improve performance. Compensation and Rewards ranks second, practices recorded a mean score of 4.46, indicating that reward systems effectively motivate Project Managers to perform better. Overall, the consistently high and very high mean scores across all HRM practices demonstrate that these practices are not only well implemented but also effective in supporting Project Manager performance within the construction industry.

4.5 Part D: Strategies to Improve the Effectiveness of HRM Practices

In this section, the authors mention the perceptions of respondents of a sample of strategies that are developed to strengthen the HRM practices in construction companies. Depending on the literature review put forward in literature review, the strategies were aligned to four basic dimensions of the HRM; Recruitment and selection, Training and development, Performance appraisal, and Compensation and rewards in addition to the Strategic HRM Integration. The respondents rated the strategies based on a five-point Likert scale. The finalized results show a high level of agreement, which means that the consensus to make strategic improvements to the processes in HRM is strongly supported by Project Managers. The identified results highlight the awareness within the industry that the systematic enhancement of the HRM is crucial in maximizing the performance of the workforce and the delivery of the projects as well as achieving the long-term viability of the organization.

Table 9 *Strategies to Improve the Effectiveness of HRM Practices*

No	Strategies to Improve Recruitment and Selection	Mean	Interpretation	Ranking
1	Establishing standardized recruitment criteria improves the quality of Project Manager selection	4.46	High	3
2	Establishing transparent recruitment criteria improves the quality of Project Manager selection	4.51	High	1
3	Including technical skill assessments in the selection process enhances hiring effectiveness	4.42	High	4
4	Including leadership skill assessments in the selection process enhances hiring effectiveness	4.46	High	3
5	Promoting fair evaluation during recruitment increases diversity and performance	4.49	High	2

No	Strategies to Improve Training and Development	Mean	Interpretation	Ranking
1	Continuous professional training programs strengthen Project Managers' technical and leadership competencies	4.45	High	2
2	Coaching programs help improve project leadership and communication skills	4.35	High	3
3	Encouraging professional certifications (e.g., PMP, CIOB) enhances industry competency and credibility	4.50	High	1
No	Strategies to Improve Performance Appraisal	Mean	Interpretation	Ranking
1	Implementing project-based performance indicators makes performance appraisal more relevant and accurate	4.46	High	2
2	Regular feedback improves motivation and development	4.45	High	3
3	Linking appraisal results with training and rewards increases job satisfaction and productivity	4.50	High	1
No	Strategies to Improve Compensation and Rewards	Mean	Interpretation	Ranking
1	Providing performance-based bonuses encourages higher commitment and productivity	4.50	High	1
2	Recognizing achievements through non-monetary rewards (e.g., awards, promotion) motivates better performance	4.46	High	3
3	Aligning compensation with market rates helps attract and retain skilled Project Managers	4.49	High	2
No	Strategies to Improve Strategic HRM Integration	Mean	Interpretation	Ranking
1	Aligning HRM practices with organizational strategy enhances overall project performance	4.42	High	1
2	Integrating HRM policies across all project phases improves consistency and workforce stability	4.40	High	2

The findings on strategies to improve the effectiveness of Human Resource Management (HRM) practices are presented in Table 9. Overall, the results indicate very high agreement among respondents regarding all proposed strategies, with overall mean scores ranging from 4.41 to 4.47. This suggests that Project Managers strongly support the adoption of structured, transparent, and strategic HRM initiatives to enhance organizational performance. Among recruitment and selection strategies, establishing transparent recruitment criteria ranked 1, recorded the highest mean score of 4.51, followed by promoting fair evaluation during recruitment ranked second achieving the mean score of 4.50 and including leadership skill assessments in the selection process ranked third achieving the mean score of 4.46. These findings indicate strong agreement that fairness, transparency, and competency-based assessments are essential in improving the quality of Project Manager selection.

In terms of training and development, respondents expressed very high agreement that continuous professional training ranked second achieving the mean score of 4.45 and encouraging professional certifications ranked first achieving the mean score of 4.50 are critical in strengthening competencies and industry credibility. Similarly, strategies related to performance appraisal achieved the highest overall mean score of 4.47, with linking appraisal results to training and rewards ranking first, achieving the mean score of 4.50 and implementing project-based performance indicators ranking second, achieving the mean score of 4.46 being strongly supported. Compensation and reward strategies also received very high agreement, particularly performance-based bonuses ranking first, achieving the mean score of 4.50 and alignment of compensation with market rates ranking second, achieving the mean score of 4.49. Furthermore, strategies related to strategic HRM integration recorded a high overall mean score of 4.41, indicating strong support for aligning HRM practices with organizational strategy and integrating HRM policies across all project phases. Overall, the results

demonstrate that respondents strongly agree that a comprehensive and integrated HRM approach is essential for improving Project Manager performance in construction projects.

4.6 Discussions

For objective 1, the findings indicate that HRM practices are implemented at a high level across all examined dimensions, namely recruitment and selection, training and development, performance appraisal, and compensation and rewards. The overall mean scores for these practices ranged between 4.08 and 4.31, reflecting a strong level of HRM implementation among the surveyed construction organizations. Recruitment and selection recorded a high overall mean score of 4.30, suggesting that clear job descriptions, clearly stated job requirements, structured interviews, and fair assessment methods are widely practiced. This indicates that construction firms recognize the importance of systematic recruitment in ensuring competent Project Manager selection. This finding is consistent with previous studies which emphasize that structured recruitment processes improve employee-role fit and project performance (Boxall et al., 2007; Loosemore et al., 2003). Training and development practices also demonstrated high implementation with an overall mean score of 4.08. Regular technical training, leadership development programs, soft skills training, and support for professional certification were positively rated by respondents. This aligns with the findings of Turner (2014) and PMI (2021), who highlighted that continuous learning and competency development are essential for Project Managers to cope with increasing project complexity. Similarly, performance appraisal practices achieved a high overall mean score of 4.26, indicating that performance reviews are conducted regularly and appraisal criteria are linked to project outcomes such as time, cost, quality, and safety. This supports Armstrong and Taylor's (2020) assertion that performance appraisal systems aligned with organizational objectives enhance employee accountability and performance. Compensation and rewards also recorded a high level of implementation with an overall mean score of 4.31, suggesting that competitive compensation packages, performance-based incentives, and non-financial rewards are commonly applied within the industry.

For objective 2, the findings further revealed that HRM practices are not only well implemented but also highly effective in enhancing Project Manager performance. Recruitment and selection effectiveness recorded a high mean score of 4.38, indicating that current recruitment practices contribute positively to hiring competent Project Managers. This supports Kerzner's (2017) argument that effective recruitment directly influences project leadership quality and project success. Training and development emerged as the most effective HRM practice, with a very high mean score of 4.52. This highlights the crucial role of continuous professional development in improving Project Managers' skills and career growth. Similar conclusions were reported by Turner (2014), who emphasized that ongoing training strengthens technical competence, leadership capability, and decision-making skills in project environments. Performance appraisal and compensation and rewards also demonstrated high effectiveness, with mean scores of 4.43 and 4.46 respectively. These findings suggest that regular feedback, clear identification of strengths and weaknesses, and reward systems linked to performance motivate Project Managers to perform better. This is consistent with the findings of Armstrong and Taylor (2020), who found that effective appraisal and reward systems enhance employee motivation, job satisfaction, and productivity.

For objective 3, the findings indicate a very high level of agreement among respondents regarding the strategies proposed to improve the effectiveness of Human Resource Management practices, with overall mean scores ranging from 4.41 to 4.47. For recruitment and selection strategies, establishing transparent recruitment criteria recorded the highest mean score of 4.51, followed by promoting fair evaluation during recruitment with a mean score of 4.50, and incorporating leadership skill assessments in the selection process with a mean score of 4.46. These very high mean values indicate strong agreement that structured, transparent, and competency-based recruitment systems are essential for improving the quality of Project Manager selection. This finding is consistent with the views of Boxall *et al.* 2007, who emphasized that fairness and transparency are critical elements of effective HRM systems. In relation to training and development strategies, continuous professional training programs achieved a high mean score of 4.45, while encouraging professional certifications such as PMP and CIOB recorded a mean score of 4.50. These results demonstrate strong agreement among respondents that continuous learning and professional development are crucial for strengthening Project Managers' technical competencies, leadership capabilities, and industry credibility. This supports the position highlighted by the Project Management Institute 2021, which emphasizes the importance of lifelong learning in enhancing project management effectiveness. Strategies related to performance appraisal also received very strong support, recording the highest overall mean score of 4.47 among all strategy dimensions. Linking appraisal results with

training and rewards achieved a mean score of 4.50, while implementing project-based performance indicators and providing regular feedback both recorded mean scores of 4.46. These findings suggest that respondents strongly agree that appraisal systems tailored to project outcomes enhance relevance, accuracy, and motivation. This aligns with the findings of Turner 2014, who stated that performance appraisal systems aligned with project objectives improve performance evaluation effectiveness. In addition, compensation and reward strategies were perceived as highly important, with performance-based bonuses recording a mean score of 4.50, alignment of compensation with market rates achieving 4.50, and recognition through non-monetary rewards receiving a mean score of 4.46. These very high mean values indicate strong agreement that both financial and non-financial rewards play a significant role in motivating higher commitment and productivity among Project Managers. Finally, strategies related to strategic HRM integration recorded a high overall mean score of 4.41, indicating strong agreement that aligning HRM practices with organizational strategy and integrating HRM policies across all project phases enhance workforce consistency, stability, and overall project performance. This finding supports the strategic HRM perspective discussed by Armstrong and Taylor 2020, which emphasizes the alignment of HRM systems with organizational goals to achieve sustained competitive advantage.

5. Conclusion

This research looked at the adoption and success of the HRM practices in Project Managers in the Malaysian construction sector. The findings show that the level of HRM practices is mostly implemented and effective with training and development being the most powerful one. Strategic enhancements to the HRM systems were also highly embraced by the Project Managers. It is said that construction organizations should enhance competency-based recruitment frameworks, increase continuous training and developments on professional development, increase feedback systems to performance appraisal systems, and both financial and non-financial reward structures. Moreover, the HRM practices must be incorporated in the organizational planning in a strategic manner so that they can be consistent and effective over a long period. These initiatives would allow construction organizations to improve the performance of Project Managers, as well as overall outcomes of the project.

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Conflict of Interest

The author declares that there is no conflict of interest regarding the publication of this paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Choy Bao Ying, Norliana binti Sarpin; **data collection:** Choy Bao Ying; **analysis and interpretation of results:** Choy Bao Ying, Norliana binti Sarpin; **draft manuscript preparation:** Choy Bao Ying, Norliana binti Sarpin, Zailawati binti Khalid, Roshartini binti Omar, Aina Mardiah binti Sallehuddin, Hilyati binti Sabtu@Othman. All authors reviewed the results and approved the final version of the manuscript.

References

- Ahmadi Eftekhari, S., Akbarnezhad, A., & Hosseini, M. R. (2022). Competency-based recruitment and selection of project managers in construction projects. *International Journal of Project Management*, 40(3), 219–232.
- Armstrong, M., & Taylor, S. (2020). *Armstrong's handbook of human resource management practice* (15th ed.). Kogan Page.
- Ashworth, A., & Perera, S. (2018). *Contractual procedures in the construction industry* (6th ed.). Routledge.
- Boselie, P. (2019). *Strategic human resource management: A balanced approach* (2nd ed.). McGraw-Hill Education.
- Boxall, P., Purcell, J., & Wright, P. (2007). *The Oxford handbook of human resource management*. Oxford University Press.
- Bratton, J., & Gold, J. (2017). *Human resource management: Theory and practice* (6th ed.). Palgrave Macmillan.

- Bredin, K., & Söderlund, J. (2011). Human resource management in project-based organizations: The HR quadriad framework. *International Journal of Human Resource Management*, 22(11), 2287–2309.
- CIDB Malaysia. (2021). *Construction industry review and outlook*. Construction Industry Development Board Malaysia.
- Clutterbuck, D. (2014). *Coaching and mentoring: Practical conversations to improve learning*. Routledge.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approach* (5th ed.). SAGE Publications.
- DeNisi, A. S., & Murphy, K. R. (2017). Performance appraisal and performance management: 100 years of progress. *Journal of Applied Psychology*, 102(3), 421–433.
- Doloi, H. (2015). Cost overruns and failure in project management: Understanding the roles of key stakeholders in construction projects. *Journal of Construction Engineering and Management*, 141(1), 04014078.
- Dvir, D., Sadeh, A., & Malach-Pines, A. (2018). Projects and project managers: The relationship between project manager's personality, project types, and project success. *Project Management Journal*, 49(2), 74–90.
- Enshassi, A., Al Swaiti, E., & Arain, F. (2016). Human resource management in the construction industry: Practices, challenges, and future directions. *International Journal of Construction Management*, 16(3), 198–213.
- Ershadi, M., Jefferies, M., & Davis, P. (2020). Developing a framework to measure sustainability performance of construction projects. *International Journal of Construction Management*, 20(7), 764–778.
- Etikan, I. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4.
- Evans, J. R., & Mathur, A. (2018). The value of online surveys. *Internet Research*, 28(4), 854–887.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.
- Huemann, M. (2015). Human resource management in the project-oriented organization. *International Journal of Project Management*, 33(4), 862–876.
- Ingason, H. T., & Jonson, H. (2009). Contemporary knowledge and skill requirements in project management. *Project Management Journal*, 40(2), 59–69.
- InvestKL. (2022). *Kuala Lumpur construction and investment overview*. InvestKL Corporation.
- Joshi, A., Kale, S., Chandel, S., & Pal, D. K. (2015). Likert scale: Explored and explained. *British Journal of Applied Science & Technology*, 7(4), 396–403.
- Kerzner, H. (2017). *Project management: A systems approach to planning, scheduling, and controlling* (12th ed.). John Wiley & Sons.
- Kerzner, H. (2025). *Project management best practices: Achieving global excellence* (5th ed.). John Wiley & Sons.
- Ling, F. Y. Y., Ning, Y., Chang, Y. H., & Zhang, Z. (2018). Human resource management practices to improve project performance in the construction industry. *Engineering, Construction and Architectural Management*, 25(3), 374–391.
- Lingard, H., & Oswald, D. (2017). *Construction health and safety in developing countries*. Routledge.
- Loosemore, M., Dainty, A., & Lingard, H. (2003). *Human resource management in construction projects: Strategic and operational approaches*. Spon Press.
- Meng, X., & Sarnell, A. (2019). Developing a framework for effective performance management in construction. *International Journal of Productivity and Performance Management*, 68(1), 150–170.
- Moon, S., Kim, D., & Lee, J. (2018). Selection criteria of project managers for construction projects. *International Journal of Construction Management*, 18(4), 297–308.
- Müller, R., & Turner, J. R. (2017). Leadership competency profiles of successful project managers. *International Journal of Project Management*, 35(6), 1108–1122.
- Naderifar, M., Goli, H., & Ghaljaei, F. (2017). Snowball sampling: A purposeful method of sampling in qualitative research. *Strides in Development of Medical Education*, 14(3), e67670.
- Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis. *Language Teaching Research*, 19(2), 129–132.
- Noe, R. A., Hollenbeck, J. R., Gerhart, B., & Wright, P. M. (2020). *Human resource management: Gaining a competitive advantage* (11th ed.). McGraw-Hill Education.
- Park, S., & Lee, S. (2018). The effects of compensation systems on job performance. *International Journal of Human Resource Management*, 29(12), 1971–1993.
- Project Management Institute. (2021). *A guide to the project management body of knowledge (PMBOK® Guide)* (7th ed.). PMI.
- Ramazani, J., & Jergeas, G. (2015). Project managers and the journey from good to great. *International Journal of Project Management*, 33(4), 852–862.
- Rea, L. M., & Parker, R. A. (2014). *Designing and conducting survey research* (4th ed.). Jossey-Bass.
- Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.

- Scott, S. (2016). Reward management in project-based organizations. *International Journal of Project Management*, 34(4), 594–604.
- Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill-building approach* (7th ed.). John Wiley & Sons.
- Shafii, H., & Bahaudin, A. (2019). Developing project manager competencies in construction. *Journal of Construction in Developing Countries*, 24(2), 1–19.
- Sunindijo, R. Y. (2015). Leadership styles and project manager performance. *International Journal of Project Management*, 33(4), 915–926.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Pearson.
- Taber, K. S. (2018). The use of Cronbach's alpha. *International Journal of Science Education*, 40(6), 1273–1296.
- Taherdoost, H. (2016). Sampling methods in research methodology. *International Journal of Academic Research in Management*, 5(2), 18–27.
- Turner, J. R. (2014). *The handbook of project-based management: Leading strategic change in organizations* (4th ed.). McGraw-Hill Education.
- Turner, J. R., Huemann, M., Anbari, F., & Bredillet, C. (2016). Perspectives on projects. *International Journal of Project Management*, 34(4), 712–728.
- Urazova, S. (2023). Compensation strategies and employee motivation in project-based firms. *International Journal of Human Resource Studies*, 13(1), 45–60.
- Wiersma, W. (1995). *Research methods in education: An introduction* (6th ed.). Allyn & Bacon.
- Wright, P. M., & McMahan, G. C. (2011). Exploring human capital: Putting “human” back into strategic human resource management. *Human Resource Management Journal*, 21(2), 93–104.
- Yap, J. B. H., Abdul-Rahman, H., & Chen, W. (2019). Critical causes of project delays in Malaysia. *Journal of Construction in Developing Countries*, 24(1), 1–18.
- Zainal, R., Zawawi, E. M. A., & Kamaruzzaman, S. N. (2022). Reward systems and employee retention in construction firms. *Journal of Construction Management*, 45(3), 289–301.