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RESEARCH ARTICLE

Effect of Encouragement-based Management Mechanism on Construction Firms' Manpower Development: An Empirical Study from Vietnam

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Abstract

The construction industry should seek to enrich its workforces due to the increasing lack of trained and skilled employees. This study attempts to investigate the relationship between encouragement-based management mechanism (EMM) and manpower development (MD) in construction firms and examine the moderating effect of firm size on this relationship by conducting bivariate Pearson correlation and hierarchical multiple regression analyses to analyse empirical data collected from 79 construction firms in Vietnam. The results show that EMM positively affected MD, and this positive effect was stronger in small/medium-sized construction firms than in large firms. The findings could provide construction firms in Vietnam, as well as other developing countries, with a better understanding of the effect of EMM on MD. Hence, they could establish appropriate and wise encouragement-based strategies to enhance their manpower. This study could contribute to the extant literature on construction manpower development by providing empirical evidence of the EMM–MD relationship in the context of construction firms.

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Keywords

Construction Firm; Construction Industry; Manpower Development; Management Mechanism; Encouragement

Introduction

In developing countries, the construction industry can significantly contribute to any economic development (Nguyen et al., 2004a; Illankoon et al., 2019), as construction works are among the major economic activities (Tam et al., 2007). Such industry plays a vital role in enhancing people's life quality and meeting any society's needs (Tam et al., 2012). The success of construction projects (e.g., residential/transportation projects) becomes very important. However, this is not an easy task for construction firms, because of the fragmented, task-oriented and project-based nature of construction-related works (Forcada et al., 2013). Beside high-cost pressure and shortened project cycles (Ribeiro, 2009), construction firms may face many challenges in satisfying construction clients, who become more sophisticated and usually require more units of construction but fewer units of expenditure (Engwall, 2003). Similar to those in other developing countries, such challenges could also be difficult for construction firms in Vietnam, whose construction industry is criticized for its weakness and inefficiency (Le-Hoai et al., 2010), owing to bureaucracy (Nguyen et al., 2004b; Le-Hoai et al., 2010), complexity of legal and institutional frameworks (Le-Hoai et al., 2010), lack of modern equipment and plant (Nguyen et al., 2004b), lack of advanced design and construction knowledge (Ling et al., 2009), lack of project management ability (Ling et al., 2009) and lack of financial capacity (Ling et al., 2009; Le-Hoai et al., 2010). Thus, construction firms in Vietnam are attempting to seek new directions in business operations to cope with new threats and challenges of today's fast changing environment (Dave and Koskela, 2009).

Nowadays, construction projects are increasingly complex and dynamic (Nguyen et al., 2004a; Ribeiro, 2009). To implement such projects successfully, possessing many qualified employees during project implementation processes is vital. However, the expensive costs of attracting and retaining such employees may be a financial burden for most construction firms (Kamara et al., 2002). The challenges of how to maintain enough manpower in construction projects are becoming more difficult because of construction employees' high mobility (Dang et al., 2018). Accordingly, construction firms with stable manpower will have competitive advantages (Kale and Karaman, 2012). Nevertheless, developing countries are frequently facing multiple unexpected criticisms about human-related problems, and Vietnam is no exception (Le-Hoai et al., 2010). Specifically, despite labour redundancy (Ho et al., 2007), trained and skilled employees, which are essential to construction firms' survival and performance (Jones et al., 2010), are increasingly lacking in many developing countries, including Vietnam (Nguyen et al., 2004b). Thus, a study, which focuses on exploring how to develop construction manpower effectively, is useful to practitioners (e.g., project and firm managers) in Vietnam, as well as other developing countries.

Currently in Vietnam, construction firms are trying to widely apply some innovative techniques (e.g., building information modelling (BIM), virtual reality (VR) and 3D laser scanning) in major and complex construction projects (Nguyen et al., 2020). However, this is not an easy task for construction firms due to such techniques' advanced characteristics. Specifically, to deploy any advanced technique (e.g., BIM) effectively and successfully, construction firms need to have enough awareness about its applications (e.g., BIM awareness) and comprehensive assessments about its helpfulness, flexibility and friendliness (e.g., awareness assessment or awareness identify). For this reason, together with various applied science and technology labs in engineering/technology universities, many construction firms are establishing their own BIM/VR departments to study how to effectively apply technological approaches (e.g., BIM or VR) in practice. As such, construction firms should seek to enrich their firm managers (e.g., BIM managers) and project participants (e.g., BIM coordinators and engineers) in terms of professionalism, technological

capabilities and management skills (Nguyen and Hadikusumo, 2018). Accordingly, manpower development (MD) is considered as a crucial strategy (Harrison, 2000). Although encouragement-based management mechanism (EMM) could be a right direction to develop organizational manpower (Schneider and Bowen, 1995), there is still a lack of empirical studies which focus on examining the effect of EMM on MD in both construction and other engineering industries. Generally, previous studies just attempted to explore the link of rewards and/or recognition with employee motivation (e.g., Danish and Usman, 2010; Hafiza et al., 2011), employee satisfaction (e.g., Yusuf et al., 2007; Turkyilmaz et al., 2011), employee commitment (e.g., Nazir et al., 2016) and job satisfaction (e.g., Kim et al., 2009; Bustamam et al., 2014). To fill the gap of research, this study mainly aims to investigate the relationship between EMM and MD in construction firms. To achieve this purpose, this study conducts a questionnaire-based survey to collect empirical data from construction firms in Vietnam. This study's purpose also responds to the call for more new research to investigate encouragement-related issues and address their effects on various organizations' performance (Russell and Stone, 2002). In addition, this study's findings comply with Nguyen and Hadikusumo's (2018) suggestion that firms must endeavour to establish comprehensive human resource development strategies to fully enhance the workforce's competencies and satisfy the job requirements. Furthermore, it is expected that this study could provide construction firms in Vietnam, as well as other developing countries, with a better understanding of the effect of EMM on MD. Such understanding may be very useful to develop organizational manpower (e.g., young engineers) of construction firms in developing countries including Vietnam, whose construction industry is still a labour-intensive industry (Chih et al., 2018), but usually faces a high employee turnover rate (Chih et al., 2016).

Theoretical background

VIETNAM'S CONSTRUCTION INDUSTRY AND FIRMS

Vietnam is currently an emerging market, which has had high gross domestic product growth rates in recent decades (Nguyen et al., 2004b) and is attracting many global investors' attention (Ling and Bui, 2009). With the increasing construction investments (Nguyen et al., 2004b), the construction industry plays a vital role in contributing to Vietnam's socio-economic development so as to meet the needs of infrastructure development and urbanization (Le-Hoai et al., 2010). Nevertheless, Vietnam's construction industry, which is still a labour-intensive industry (Nguyen et al., 2004b), is not as advanced as neighbouring countries' counterparts (Ho et al., 2007). Thus, the Vietnamese construction industry is seeking to reduce its inefficiency and weakness in order to increase its competitiveness with its counterparts (Chou et al., 2013).

In Vietnam, apart from micro enterprises (≤ 10 employees, which was not the target of this study's survey), construction firms are usually categorized as follows: small (10-200 employees), medium (200-300 employees) and large (> 300 employees). In general, small/medium-sized construction firms are less resourceful than large firms (Dang et al., 2020) and, therefore, confront many difficult challenges in their business operations. After Vietnam became a member of the World Trade Organization, such firms even face more intense competition from both domestic large competitors and foreign counterparts (Ling and Bui, 2009). As compared with foreign firms, Vietnamese construction organizations, especially small/medium-sized firms, are lagging behind in financial capacity, project management ability, knowledge in advanced design and construction technologies, and experience in complex projects (Ling et al., 2009). To survive and develop in today's high-risk, competitive and opportunistic construction environment, Vietnamese construction firms are trying to seek effective and wise strategies to improve their competencies (Le-Hoai et al., 2010) and competitiveness (Ling et al., 2009).

ENCOURAGEMENT-BASED MANAGEMENT MECHANISM IN CONSTRUCTION FIRMS

Literature has proposed various encouragement-related definitions. Dinkmeyer and Losoncy (1996) supposed encouragement as a process of facilitating the development of a person's inner resources and courage toward positive movement. Amabile (1997) defined organizational encouragement as an organization's culture which encourages creativity through reward and recognition for creative works; organizational mechanisms for developing new ideas, fair and constructive judgments of ideas and active flows of ideas; and shared visions towards organizational objectives and missions. Fu (2001) considered encouragement mechanism as a process which could help to arouse people's motive, strengthen people's will and improve people's knowledge. Na-Nan et al. (2016) described an organization's encouragement as its encouragement of employee values or concern about good living conditions and promotion. It can be seen that so far, EMM has been ambiguously defined, indicating the need for more research about EMM in different organizations. Especially, in the construction field, as yet there have been no studies which focus on EMM and its effects on various organizational performance. Thus, exploring EMM in construction firms, which play a major role in the construction industry, is vital.

Recently, drawing from Amabile's (1997) definition, Dodge et al. (2017) have suggested three dimensions for measuring organizational encouragement: (1) encouraging people to solve problems creatively, (2) developing good mechanisms for generating creative ideas and (3) encouraging people to express unusual ideas without any fear of being called stupid. Based on the same organizational encouragement definition of Amabile (1997) and building upon Dodge et al.'s (2017) suggestion, this study proposes three more specific EMM contributors—including incentives, learning encouragement and collaboration encouragement—which construction firms can use to stimulate employees' enthusiasm about work (e.g., encourage employees to work or solve problems creatively), generate creative and useful ideas and have good teamwork and communication (e.g., share ideas, knowledge and information), respectively. In addition to their appropriateness with the context of construction environments, these EMM constructs were selected because they were frequently emphasized in project-based settings by project/firm management scholars (e.g., Teerajetgul and Charoenngam, 2006; Teerajetgul et al., 2009; Park et al., 2010).

Specifically, due to hard construction works, construction firms should provide incentives to meet employees' needs and, therefore, increase employees' motivation and satisfaction. In construction projects, incentives could significantly affect work productivity and employee performance (Teerajetgul and Charoenngam, 2006). Indeed, incentives' power is immense and pervasive in many hard and high-risk work settings, including construction environments (Thwala and Monese, 2006). This is consistent with previous studies (e.g., Pham and Swierczek, 2006; Teerajetgul et al., 2009; Teo and Ling, 2009; Lai et al., 2011; Abdulsalam et al., 2012; Tserng et al. 2016), which recognized incentives as an important managerial scheme in project-based organizations.

In such organizations, professional knowledge is also majorly embedded in employees implementing project tasks; thereby, it is necessary to provide various opportunities for employees' continuous learning (i.e., knowledge improvement) and informal and formal collaborations (i.e., knowledge exchange) (Wei and Miraglia, 2017; Ghosh et al., 2013). In today's fast changing environment, learning is an important driver of innovation to maintain long-term competitive advantages of project-based organizations (Robinson et al., 2005; Park et al., 2010). It is no surprise because learning is a process of acquiring knowledge in which learners (i.e., employees) assimilate new ideas critical for innovation and performance (Johnson and Sohi, 2003). Besides, employees' voluntary development and continuous learning are critical to organizational effectiveness (Noe and Wilk, 1993).

In addition, collaboration encouragement could also be necessary in today's construction environment, which requires team members to collaborate by being rational towards each other (e.g., good teamwork and communication) (Teerajetgul and Charoenngam, 2006). This is because construction is a project-based

industry, where each project is unique and brings many practitioners collaborating with each other at various stages during its lifecycle (Dave and Koskela, 2009; Tserng et al., 2010). Furthermore, collaboration may result in resource integration and new high potential service offers (Melton and Hartline, 2013). Collaborative capabilities (e.g., collaboration across functional areas) could also support to build absorptive competence, which is necessary for any firm to comprehend external environment trends (Lusch et al., 2007).

MANPOWER DEVELOPMENT IN CONSTRUCTION FIRMS

Nowadays, manpower (also known as workforce and human resource) is becoming one of the most valuable resources (Danish and Usman, 2010), which is a key determinant of sustaining the success of any firm (Brammer et al., 2007). This is why MD is increasingly considered as a vital aspect of organizational performance in most firms (Swart et al., 2005). Especially, in today's highly competitive business environment, MD could not only support a firm's business operations, but also play a pivotal role in shaping its business strategies (Torraco and Swanson, 1995). Without exception, MD is also necessary for construction firms, as manpower occupies a key role in determining the success of most construction projects (Nguyen et al., 2004a). Thus, a number of research efforts have been devoted to understanding the concept of MD.

Literature has proposed various MD-related definitions. However, MD is still vaguely defined, because it is not easy to explain MD adequately (Kumpikaite, 2008). In other words, there is no single agreement on the definitions of MD (Dilworth, 2003). Pace et al. (1991) described MD as the individual, career and organizational development roles to achieve maximum productivity, quality, opportunity and fulfillment for organizational members when they work to accomplish their organization's goals. Swanson (1996) assumed MD as the development of human expertise through organizational development and personnel training and development. Kumpikaite (2004) supposed that MD could help to improve personal and teamwork performance, which combines organizational and personal employees' objectives and needs, as well as allows employees to develop continuously. Wilson (2005) considered MD as an influential and growing discipline which is increasingly crucial to the survival and success of multiple organizations. It is observed from these various definitions that MD involves both individual (e.g., improving employee skills) and organizational (e.g., improving organizational manpower) development, which could significantly contribute to organizations' survival and success.

For construction firms, this indicates the need to acquire strong and stable manpower. Unsurprisingly, to have such manpower, construction firms can recruit new experienced and skilled employees. However, the recruitment of these employees is usually time-consuming (e.g., spending much time for multiple interviews) and even costly (e.g., paying high salaries to attract new good employees/engineers). On the other hand, it also takes much time for new employees to adapt to construction firms' working environment and/or organizational culture. As such, in order to reduce these unexpected problems, construction firms need to exploit their own personnel by improving professional skills of current employees and developing young employees. Owing to the high turnover rate in today's construction industry (Chih et al., 2016), enhancing employee retention (e.g., increasing employees' satisfaction and long-term working commitment) could also be crucial to maintain construction firms' competitiveness (Kyndt et al., 2009) and business operations. Taking these altogether, in order to maintain superior MD performance without much pressure of new recruitment, construction firms should focus on improving professional skills of employees (Anantatmula, 2007; Dang et al., 2019), increasing employee retention (Kyndt et al., 2009; Chih et al., 2018; Dang et al., 2019) and developing young employees (Dang et al., 2018; Dang and Le-Hoai, 2019).

Research model and hypotheses

Based on the above discussions, this study investigates the effect of EMM—including incentives, learning encouragement and collaboration encouragement—on MD in construction firms. Taking the view that "one size does not fit all" (Shenhar, 2001), this study further examines the moderating effect of firm size on this EMM–MD relationship. Figure 1 presents the research hypotheses, followed by detailed discussions.

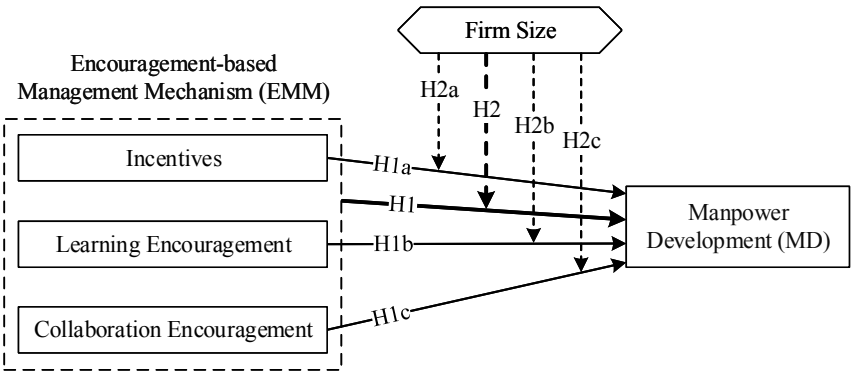

Figure 1. Theoretical framework and research hypotheses

ENCOURAGEMENT-BASED MANAGEMENT MECHANISM AND MANPOWER DEVELOPMENT

Given the important role in improving productivity and performance, employee encouragement may significantly support organizational improvement (Talib et al., 2011). Employee encouragement could also motivate employees to perform better (Talib et al., 2010) and, therefore, enhance client satisfaction (Tarí, 2005), which is a major goal for any firm's survival and development (Fečiková, 2004). Nevertheless, prior literature has just attempted to investigate two common forms of employee encouragement: reward and recognition. More specifically, observing a number of previous relevant studies in this regard (Table 1) reveals that there is very little research focusing on organizational performance (e.g., Yusuf et al., 2007) when compared with employee-related performance (e.g., Yusuf et al., 2007; Kim et al., 2009; Danish and Usman, 2010; Hafiza et al., 2011; Turkyilmaz et al., 2011; Bustamam et al., 2014; Nazir et al., 2016). These altogether indicate the need to explore more about employee encouragement and its effect on various firm-level performance aspects (e.g., MD).

In construction, there is still a lack of studies which focus on the field of employee encouragement. Especially, as yet the effect of employee encouragement on MD has not been investigated for architecture, engineering and construction (AEC) organizations, including construction firms. To bridge the gap of research, this study attempts to investigate the relationship between EMM and MD in construction firms. Besides, in order to verify the importance of the proposed EMM contributors (i.e., incentives, learning encouragement and collaboration encouragement), the individual effects of these constructs on MD should also be investigated. Thus, this study hypothesizes that:

H1: EMM—including incentives (H1a), learning encouragement (H1b) and collaboration encouragement (H1c)—is positively related to MD in construction firms.

POTENTIAL MODERATING ROLE OF FIRM SIZE

Firm size is acknowledged as a good proxy for multiple organizational attributes (Zhang et al., 2019). Firm size may reflect the development of organizational routines for interactions across different functions or

Table 1. Summary of employee encouragement-related studies in prior literature

Previous study	Field of research	Summary of research finding
Yusuf et al. (2007)	Manufacturing and service companies	Reward and recognition were positively related to employee satisfaction and organizational performance
Kim et al. (2009)	Hotels	Rewards displayed a positive effect on employee job satisfaction
Danish and Usman (2010)	Different types (e.g., financial service, telecommunication, education and manufacturing)	Reward and recognition had a great impact on employee motivation
Hafiza et al. (2011)	Non-profit organizations	There was a direct relationship between extrinsic rewards and employee motivation
Turkyilmaz et al. (2011)	Public insurance company	Reward and recognition could significantly affect employee satisfaction
Bustamam et al. (2014)	Hotels	Rewards were positively and significantly associated with job satisfaction
Nazir et al. (2016)	Different types (i.e., banking, education, hospitality, health care and telecommunication)	Extrinsic, social and intrinsic rewards were significantly related to affective and normative employee commitment

within individual functions in a firm (Dougherty and Hardy, 1996) and facilitate/constrain organizational activities (Zona et al., 2013). Thus, firm size is a vital factor in management activities of different-sized firms (Li and Chen, 2018).

A literature study which focused on firm size was conducted. Several studies attempted to understand the moderating role in various organizational issues. Lin et al. (2012) found that organizational size moderated the relationship between disclosure of human capital information and firm performance of public companies. Gong et al.'s (2013) study in high-technology firms presented that the relationship between employee creativity and relative firm performance was moderated by firm size. Li and Chen's (2018) study revealed that firm size moderated the impact of board gender diversity on firm performance of non-financial firms. In addition, some other endeavours focused on investigating the moderating effect of firm size towards innovation-related issues. Zona et al. (2013) found that firm size moderated the effects of board size, outsider ratio and board diversity on firm innovation. Prasad and Junni (2017) explored that organizational size moderated the effect of CEO psychological characteristics on firm innovativeness. Yu and Lee (2017) revealed that firm size was a moderator in the relationship between collaboration with research organizations and innovation performance in manufacturing firms. Petruzzelli et al.'s (2018) study in biotechnology firms showed that there was a moderating effect of firm size on the relationship between knowledge maturity and innovation value. In sum, firm size, as a moderator variable, has recently

received much attention from multiple researchers. However, various implications of firm size have not been investigated expansively (Zhang et al., 2019). Especially, in the construction field, very little research has focused on examining the moderator role of firm size in terms of management-related issues. This indicates the need to investigate the moderating effect of firm size in this regard, because AEC firm size significantly varies in the construction industry.

Compared with small/medium-sized counterparts, large construction firms are associated with more-bureaucratic organization and more-complicated structure (Hartono et al., 2019). This may cause many challenges in learning across disciplines (Serenko et al., 2007), communication and collaboration (Blau, 1972). Furthermore, large construction firms also have a larger number of employees with various levels of education and capabilities, making it difficult to improve their manpower quality comprehensively by using encouragement-based strategies widely. In contrast, small/medium-sized construction firms with a limited number of employees often operate streamlined organizations and, therefore, could be more conducive to deploy personnel-oriented schemes. Based on these arguments, this study attempts to explore the moderating effect of firm size in terms of MD by examining the following hypotheses:

H2: The positive effect of EMM—including incentive (H2a), learning encouragement (H2b) and collaboration encouragement (H2c)—on MD is stronger in small/medium-sized construction firms than in large firms.

Research method

SAMPLE AND PROCEDURE

A questionnaire survey was conducted to collect data from the Vietnamese construction industry. Specifically, this study established a list of 283 construction firms in Vietnam based on multiple sources: e.g., postgraduate programs of construction management/ civil engineering/ bridge and road construction; alumni networks of construction engineering programs; road and bridge association; bridge, road and port association; and civil engineering association. Contact information of potential respondents (managers or key personnel) working for each firm was also identified. When multiple eligible potential respondents were listed for a firm, the one whose position was highest ranked would be selected. Furthermore, to increase the reliability and accuracy of the survey responses, the targeted respondents had over three years of experience in construction (i.e., to have sufficient knowledge about the organizational management issues, as well as the research matters of this study) and had worked in their firms for at least one year (i.e., to have an adequate understanding of the surveyed firms).

To list EMM-related and MD measuring items, this study focused on prior management-related literature on project-based organizations/environments and/or developing countries, as there have been no previous studies specifically on EMM and its effect on AEC firm performance in the construction field. This approach could help to ensure the measuring items' reliability (as they were identified carefully and empirically in previous related studies) and their applicability to this study's context (as construction firms are among main project-based organizations in the construction industry and Vietnam is an emerging economy among developing countries). Next, a questionnaire with the self-report format was designed for data collection. Accordingly, respondents were requested to rate their firms' EMM-related and MD measuring items and provide their answers for multiple questions about personal information of respondents (e.g., position) and firm characteristics (e.g., firm size). Before the official survey, the preliminary questionnaire (including 16 EMM measuring items and 3 MD measuring items) was pilot-tested by seven experienced professionals (two senior firm managers, three functional managers and two project/site managers; they all were working for construction firms and had over 10 years of industry experience) in order to not only ensure the clarity and goodness of the questionnaire characteristics (e.g.,

adequacy and appropriateness of measuring items, clarity of questions, measurement scale and questionnaire structure), but also reduce the possibility of missing some important data. Specifically, regarding EMM's measuring items, these professionals suggested excluding various inappropriate items, modifying several items for better applicability to Vietnam-based construction firms and also adding some items based on their experience. About MD's measuring items, no modifications were proposed by any professional. The modified questionnaire was also sent back to these professionals for further review/checking. After generally agreed by most professionals, the questionnaire, which consisted of 13 measuring items (to be presented more specifically in a later section), was finalized and used for the survey.

The questionnaire was distributed to the targeted respondents using private-emailing and hand-delivery methods. After about three months, among 283 distributed questionnaires, 79 valid responses were received

Table 2. Sample profile

Category	Number	Percent (%)
Firm size		
Small/medium	42	53.2
Large	37	46.8
Origin of organization		
Vietnamese construction firms	73	92.4
Foreign construction firms	6	7.6
Main field of construction		
Civil and industrial construction	57	72.2
Transportation construction	17	21.5
Other	5	6.3
Years of industry experience		
3–5 years	4	5.1
6–10 years	29	36.7
11–15 years	28	35.4
16 years or more	18	22.8
Position		
Senior firm manager	23	29.1
Functional manager	20	25.3
Project/site manager	25	31.6
Team leader	11	13.9
Education level		
Bachelor	42	53.2
Postgraduate (e.g., master or higher)	37	46.8
Total number of valid responses	*79*	*100*

after data verification (i.e., checks for adequacy, appropriateness and accuracy). The survey's response rate was approximately 27.92%, which might be resulted from two possible causes: (1) the strong inertia forces against scientific research in the Vietnamese culture (Le-Hoai et al., 2010) and (2) the relatively strict criteria of respondent selection as mentioned above. Although this response rate was not so high, it was still considered to be acceptable in the construction industry, where average response rates of 20-30% were found for many questionnaire-based surveys (Akintoye, 2000). Regarding firm size, 53.2% were from small/medium-sized construction firms and 46.8% were from large firms. Relating to the origin of organization, 92.4% and 7.6% were from Vietnamese and foreign construction firms, respectively. Noticeably, most of the respondents had much experience in construction and managerial positions (Table 2), thereby could provide reliable and valuable data for this study. These altogether imply that the collected data, though relatively small, could also considered to be representative for the whole Vietnamese construction industry.

MEASURES

The following measures were used in this study. Unless otherwise specified, all items were measured based on a 5-point Likert scale (1 = "very low" to 5 = "very high"). To check the reliability of such items' measurement, Cronbach's alpha (α), whose coefficient of 0.7 or larger is generally assumed to be acceptable (Hair et al., 2010), was used (Tam et al., 2012; Tam and Zeng, 2014).

Table 3. List of EMM-related measuring items

Description	Reference
Incentives	
Providing monetary incentives	Liska and Snell (1992), Teerajetgul and Charoenngam (2006), Teerajetgul et al. (2009)
Providing non-monetary incentives (e.g., promotion opportunities)	Fagbenle et al. (2004), Teerajetgul and Charoenngam (2006), Teerajetgul et al. (2009)
Providing rewards for employees with high accomplishments	
Learning encouragement	
Encouraging employees to attend workshops and symposia	Lee and Choi (2003), Teerajetgul and Charoenngam (2006), Teerajetgul et al. (2009)
Organizing skills training courses or formal training programs for employees	Lee and Choi (2003), Teerajetgul and Charoenngam (2006), Teerajetgul et al. (2009)
Encouraging individuals' self-learning	
Facilitating employees' experiential learning	
Collaboration encouragement	
Encouraging employees to collaborate with others	Lee and Choi (2003), Teerajetgul and Charoenngam (2006), Teerajetgul et al. (2009)
Encouraging employees to support others	Lee and Choi (2003), Teerajetgul and Charoenngam (2006), Teerajetgul et al. (2009)
Appreciating employees' willingness to take responsibility in coordination	

EMM (α = 0.917) was measured with 10 items (Table 3). Specifically, EMM includes incentives (three items; α = 0.753), learning encouragement (four items; α = 0.861) and collaboration encouragement (three items; α = 0.910). MD (α = 0.887) was measured with three items, which rated construction firms' performance with regard to improving professional skills of employees (Dang et al., 2019), employee retention (Kyndt et al., 2009; Chih et al., 2018) and developing young employees (Dang et al., 2018; Dang and Le-Hoai, 2019).

In line with previous studies (e.g., Leal-Rodríguez et al., 2015), this study measured firm size based on the number of employees. Specifically, construction firms with less than 300 employees were categorized as small (10-200 employees)/medium (200-300 employees) firms while large firms had more than 300 employees (Dang et al., 2018).

DATA ANALYSIS

Inferential statistics—including bivariate Pearson correlation analysis and hierarchical multiple regression analysis—are used to test the research hypotheses. These analysis methods were selected because they were widely used to investigate the relationships of independent and moderator variables with a dependent variable in many previous studies (e.g., Chih et al., 2016; Chih et al., 2017; Nguyen et al., 2019), which is similar in nature to this study's research objectives. In addition to this reason, the sample size of the collected data (i.e., 79 valid responses) was also considered to be more appropriate with these analysis methods than structural equation modelling, which usually requires a larger sample size (i.e., at least 100 for results to be reasonably reliable and above 200 to avoid the risk of sample non-normality; Bagozzi and Yi, 2012).

Specifically, bivariate Pearson correlation analysis, which could measure the linear correlation between a pair of study variables (Nguyen et al., 2019), is used to test the possible correlations of EMM, incentives, learning encouragement and collaboration encouragement with MD stated in H1, H1a, H1b and H1c, respectively. Then, to further confirm these hypotheses, the compound effect of incentives, learning encouragement and collaboration encouragement on MD was investigated using hierarchical multiple regression analysis, which allows to assess the incremental explanatory power of study variables in each block (Cohen et al., 2003). This regression approach was also used to test H2, H2a, H2b and H2c, which hypothesized that the positive effects of EMM, incentives, learning encouragement and collaboration encouragement, respectively, on MD are stronger in small/medium-sized construction firms than in large firms. Several regression models are built by adding each independent variable (e.g., EMM or firm size) and the multiplicative interaction of these independent variables to a previous model. This analysis is mainly to show whether these independent variables could explain a statistically significant amount of variance in the dependent variable (i.e., MD).

The interaction effect is further assessed using the PROCESS macro, developed by Hayes (2017). Specifically, moderation analysis is performed to examine how the effects of EMM-related variables (EMM, incentives, learning encouragement and collaboration encouragement) on MD depend on firm size as the third moderator variable. In analysis of the interaction effect, Aiken and West (1991) define low value/high value as –1 SD/+1 SD from the mean (average) for the independent variables. Similarly, the PROCESS output reports mean and –1 SD/+1 SD for the independent variables (Nguyen et al., 2019). In this study, EMM-related variables are considered as the independent variables, whose "low implementation", "average implementation" and "high implementation" levels are represented by –1 SD, mean and +1 SD, respectively.

Results

EFFECT OF ENCOURAGEMENT-BASED MANAGEMENT MECHANISM ON MANPOWER DEVELOPMENT

Table 4 presents the results of bivariate Pearson correlation analysis. As expected, the correlation coefficient between EMM and MD was significantly positive (r = 0.716, p = 0.000), thereby supporting H1 and confirming that EMM was positively related to MD. Further, the analysis results supported H1a, H1b and H1c, meaning that, individually, each of the proposed EMM constructs (i.e., incentives, learning encouragement and collaboration encouragement) could also have a positive effect on MD.

Table 4. Results of Pearson correlation analysis

Hypothesis	Study variable	MD		Note
		r	p-value	
H1	EMM	0.716	0.000	Support
H1a	Incentives	0.593	0.000	Support
H1b	Learning encouragement	0.682	0.000	Support
H1c	Collaboration encouragement	0.610	0.000	Support

Note: r: Correlation coefficient

In addition, the possible compound effect of individual EMM constructs on MD was investigated using hierarchical multiple regression analysis. This analysis also included firm size as a control variable to avoid the possible variables-omitted bias, because the survey responses were provided by different-sized construction firms (i.e., small/medium vs large). Specifically, firm size, incentives, learning encouragement and collaboration encouragement, in turn, were entered in each step to build Models 1, 2, 3 and 4. Except Model 1 with only one variable (firm size), Model 4 includes all four variables (firm size, incentives, learning encouragement and collaboration encouragement), while Models 2 and 3 involve two (firm size and incentives) and three (firm size, incentives and learning encouragement) variables, respectively. As shown in Table 5, all models were significant. The F statistics of Models 1, 2, 3 and 4 are 11.862, 28.633, 29.282 and 24.821, respectively, with all p-values ≤ 0.001. The values of ΔR^2 are all significant, specifically: (i) Model 2 (ΔR^2 = 0.296, p = 0.000) with the presence of incentives accounted for significantly more variance than just firm size alone (Model 1); (ii) Model 3 (ΔR^2 = 0.110, p = 0.000) with the inclusion of learning encouragement accounted for significantly more variance than firm size and incentives (Model 2); and (iii) Model 4 (ΔR^2 = 0.034, p = 0.018), where collaboration encouragement was added, accounted for significantly more variance than firm size, incentives and learning encouragement (Model 3). This implies that there would be a compound effect of incentives, learning encouragement and collaboration encouragement on MD, thereby confirming the importance of the proposed EMM constructs and their significant compound contribution to MD in construction firms. These results provide further evidence supporting H1, H1a, H1b and H1c.

Table 5. Compound effect of incentives, learning encouragement and collaboration encouragement on MD

Study variable	Statistics	Model 1	Model 2	Model 3	Model 4
Firm size	Beta	0.365[d]	0.283[c]	0.226[c]	0.243[c]
Incentives	Beta	—	0.550[d]	0.230[b]	0.130
Learning encouragement	Beta	—	—	0.471[d]	0.361[c]
Collaboration encouragement	Beta	—	—	—	0.264[b]
	R^2	0.133	0.430	0.539	0.573
	ΔR^2	0.133[d]	0.296[d]	0.110[d]	0.034[b]
	F	11.862[d]	28.633[d]	29.282[d]	24.821[d]

Notes: Beta: Standardized coefficient; [a]$p \leq 0.1$; [b]$p \leq 0.05$; [c]$p \leq 0.01$; [d]$p \leq 0.001$

MODERATING EFFECT OF FIRM SIZE

Hierarchical multiple regression analysis was used to examine the moderating effect of firm size. In the first step (Model 1), two variables were included: (i) each of EMM-related variables (Table 4) and (ii) firm size (Size). In the second step (Model 2), the multiplicative interaction terms between each of EMM-related variables and Size (the moderator variable) were computed and entered into the regression equation. Specifically, with the case of "EMM" (considered as a typical example), Model 1 involves "EMM" and "Size", while Model 2 includes "EMM", "Size" and "EMM × Size" (i.e., the interaction term between EMM and Size). To reduce multicollinearity, all study variables were mean-centred (Aiken and West, 1991). Table 6 presents the summary results of hierarchical multiple regression analysis.

Table 6. Results of hierarchical moderated regression analysis

Hypothesis	Study variable	Statistics	Model 1	Model 2	Note
H2	EMM	Beta	0.672[d]	1.275[d]	Support
	Firm size (Size)	Beta	0.242[c]	1.207[d]	
	Two-way interaction (EMM × Size)	Beta	—	−1.243[c]	
		R^2	0.570	0.608	
		ΔR^2	0.570[d]	0.039[c]	
		F	50.277[d]	38.855[d]	
H2a	Incentives (IN)	Beta	0.550[d]	1.046[d]	Support
	Firm size (Size)	Beta	0.283[c]	1.003[b]	
	Two-way interaction (IN × Size)	Beta	—	−0.947[a]	
		R^2	0.430	0.455	
		ΔR^2	0.430[d]	0.025[a]	
		F	28.633[d]	20.846[d]	

Table 6. continued

Hypothesis	Study variable	Statistics	Model 1	Model 2	Note
H2b	Learning encouragement (LE)	Beta	0.632[d]	1.153[d]	Support
	Firm size (Size)	Beta	0.224[c]	0.889[c]	
	Two-way interaction (LE × Size)	Beta	—	−0.947[b]	
		R^2	0.513	0.541	
		ΔR^2	0.513[d]	0.028[b]	
		F	39.957[d]	29.443[d]	
H2c	Collaboration encouragement (CE)	Beta	0.583[d]	1.143[d]	Support
	Firm size (Size)	Beta	0.316[d]	1.219[c]	
	Two-way interaction (CE × Size)	Beta	—	−1.118[b]	
		R^2	0.471	0.508	
		ΔR^2	0.471[d]	0.037[b]	
		F	33.877[d]	25.832[d]	
H2*	Incentives (IN)	Beta	0.130	−0.044	Support
	Learning encouragement (LE)	Beta	0.361[c]	0.599[a]	
	Collaboration encouragement (CE)	Beta	0.264[b]	0.853[b]	
	Firm size (Size)	Beta	0.243[c]	1.232[c]	
	Two-way interaction (IN × Size)	Beta	—	0.311	
	Two-way interaction (LE × Size)	Beta	—	−0.395	
	Two-way interaction (CE × Size)	Beta	—	−1.179[a]	
		R^2	0.573	0.621	
		ΔR^2	0.573[d]	0.049[b]	
		F	24.821[d]	16.652[d]	

Notes: *: Testing simultaneous interaction effect; Beta: Standardized coefficient; [a]$p \le 0.1$; [b]$p \le 0.05$; [c]$p \le 0.01$; [d]$p \le 0.001$

As shown in Table 6, Model 1 in four regression analyses showed that firm size and each of four EMM-related variables (i.e., EMM, incentives, learning encouragement and collaboration encouragement) accounted for a significant amount of variance in MD. Specifically, when observing the case of "EMM", Model 1 had F = 50.277, p = 0.000. Model 2 with the interaction between "EMM" and "Size" accounted for significantly more variance than "EMM" and "Size" (F = 38.855, p = 0.000). The result of $\Delta R^2 = 0.039$, $\Delta F = 7.462$, p = 0.008 indicated that there was a potentially significant moderation between EMM and firm size on MD. In order words, the effect of EMM on MD depends significantly on firm size. Figure 2 further illustrates the effect of EMM on MD with the interaction of firm size. The figure shows a buffering effect, whereby: (i) MD increases as the implementation level of EMM increases and (ii) the degree of MD (i.e., slope) is more considerable in small/medium-sized construction firms than in large firms. Similar results were also observed for the cases of incentives, learning encouragement and collaboration encouragement. These findings altogether support H2, H2a, H2b and H2c, confirming that the positive effect of EMM—

including incentive, learning encouragement and collaboration encouragement—on MD is stronger in small/medium-sized construction firms than in large firms.

This study finally assessed the simultaneous interaction effect of three EMM constructs and firm size on MD following the aforementioned regression approach. Specifically, in Model 1, three EMM constructs (incentives, learning encouragement and collaboration encouragement) and firm size (Size) were involved. After that, to develop Model 2, the multiplicative interaction terms between these EMM constructs and the moderator variable (Size) were simultaneously added into the regression equation. Accordingly, while Model 1 contained four variables (incentives, learning encouragement, collaboration encouragement and Size), Model 2 included seven variables (incentives, learning encouragement, collaboration encouragement, Size, IN × Size, LE × Size and CE × Size). The analysis results (Table 6) showed that Model 2 (with the simultaneous interaction of incentives, learning encouragement and collaboration encouragement with Size; $F = 16.652$, $p = 0.000$), together with Model 1 ($F = 24.821$, $p = 0.000$), was significant. The result of $\Delta R^2 = 0.049$, $\Delta F = 3.033$, $p = 0.035$ further indicated a significant moderation of incentives, learning encouragement and collaboration encouragement with firm size on MD. This implies that in construction firms, the effects of incentives, learning encouragement and collaboration encouragement (as three specific constructs of EMM) on MD were simultaneously moderated by firm size. These results provide additional evidence to support H2, H2a, H2b and H2c.

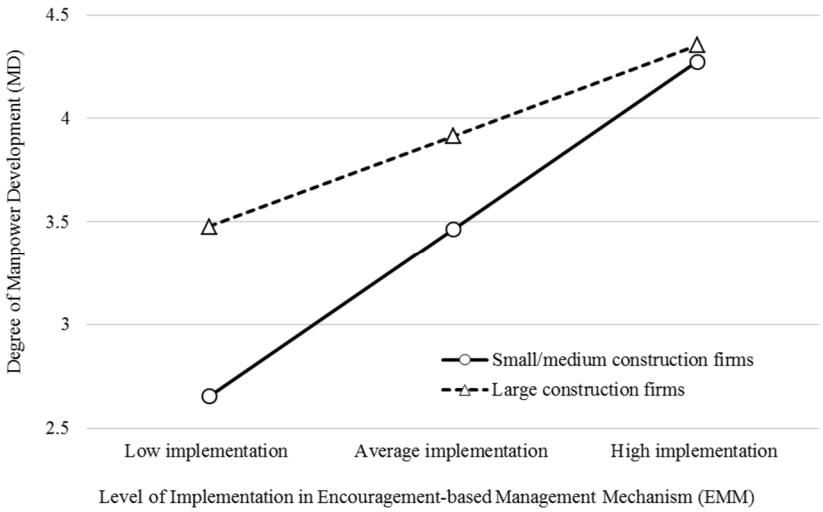

Figure 2. Effect of EMM on MD with the interaction of firm size

Discussion

The research result (Table 4) showed that EMM was positively related to MD (H1), implying that construction firms with better EMM is more likely to have superior MD performance. This may be because good development of EMM can allow construction firms to create good working environments (e.g., encouraging and favourable environments) and, thence, would not only enable them to promote employees' skills, knowledge and values, but also enhance employees' satisfaction and long-term working commitment. This finding could provide useful empirical evidence to improve construction firms' MD performance (i.e., a critical, yet unexplored, aspect of firm-level performance) via capitalizing on appropriate and wise applications of EMM. Such evidence can further contribute to the extant literature, although remains very limited, which reported the significant links of several other encouragement-related issues (e.g., reward and/

or recognition) with other performance aspects [e.g., employee creativity (Amabile et al., 1996), employee satisfaction (Yusuf et al., 2007) or quality performance (Talib et al., 2010)].

The analysis results (Tables 4 and 5) also revealed that the proposed EMM constructs (i.e., incentives, learning encouragement and collaboration encouragement), individually and simultaneously, have significantly positive effects on MD in construction firms (H1a, H1b and H1c). In general, this implies that these constructs would lead to better MD performance in construction firms, if applied properly. Noticeably, as compared with incentives, learning encouragement and collaboration encouragement, respectively, were found to have more significantly positive correlation with MD (Table 4); thereby, could be considered as important managerial schemes of construction firms in Vietnam (i.e., a fast-growing and emerging market economy), as well as other developing countries. This finding is also consistent with Chow's (2012) study, which emphasized the importance of learning intention and collaborative culture in today's highly competitive knowledge economy. Accordingly, this finding may be useful and practical to the Vietnamese construction industry, given the increasing importance of improving its workforces (Nguyen and Hadikusumo, 2018). Specifically, the implication of this finding is that construction firms in Vietnam, which usually focus more on using incentive schemes, but still pay little attention to other encouragement schemes [e.g., providing few training activities for employees (Le-Hoai et al., 2010)], could make various appropriate and effective encouragement-based improvements on management-oriented approaches to enhance their manpower.

In addition, this study found the interaction effect of EMM and firm size on MD performance (H2, H2a, H2b and H2c). Firm size moderated the relationship between EMM—including incentives, learning encouragement and collaboration encouragement—and MD in construction firms (Table 6). This result could also support Namasivayam and Denizci's (2006) study, which indicated that firm size was crucial to service organizations' human capitals. Furthermore, the degree of MD is more considerable in small/medium-sized construction firms than in large firms (Figure 2), implying that small/medium-sized construction firms could benefit significantly from developing their EMM. Specifically, small/medium-sized construction firms generally have a small number of qualified employees. Due to their limited capacities of new recruitment as compared with other large counterparts and the construction industry's high turnover rate (Chih et al., 2016), small/medium-sized construction firms may face more human-related difficulties (e.g., lack of manpower for construction projects) when employees stop working for them. Improved EMM practices may be considered as a potential solution to overcome such difficulties. Thus, small/medium-sized construction firms' managers and policy makers could establish reasonable and wise encouragement-based management strategies to develop their manpower, which is vital to project success (Nguyen et al., 2004a) and firm success (Brammer et al., 2007).

Conclusions

Given the importance of strong and stable manpower to organizational competitiveness (Kale and Karaman, 2012), the construction industry should seek to improve its workforces. Based on empirical data collected from 79 construction firms, this study explored the relationship between EMM and MD. Accordingly, this study could provide some significant implications in both theoretical and practical aspects. Theoretically, this present research is among the first attempts to investigate the role of firm size in the EMM–MD relationship. The effect of EMM on MD depends significantly on firm size. Specifically, the positive effect of EMM on MD is stronger in small/medium-sized construction firms as compared with their large counterparts, meaning that small/medium-sized construction firms could benefit significantly from developing their EMM. Practically, this study provides construction firms with empirical evidence of the effects of various encouragement-related schemes on MD. Hence, they could establish appropriate and wise encouragement-based strategies to enhance their manpower.

Despite the aforementioned contributions, some limitations of this study should also be noted. Industry-related and country-specific findings may be one of the possible limitations. The encouragement-related variables and their relationship with MD were identified for construction firms in Vietnam and, therefore, cannot be used automatically for other firm types and/or in other countries without extra data collection. Accordingly, to ascertain generalizability, the present theoretical hypotheses should be further tested in project-based organizations (e.g., AEC firms) in other countries. Future studies should also be conducted on examining the relationships between other encouragement-related variables (e.g., extrinsic, intrinsic and social rewards) and employee-level (e.g., career satisfaction) and firm-level (e.g., market-based organizational performance, firm growth and firm innovativeness) performance aspects in project-based environments and/or in other countries. Such relationships, once identified, can be of great use for improving firms' organizational mechanisms effectively, thereby enhancing their organizational business operations in today's fast changing and dynamic environment.

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