



## Research article

# Impact of organizational learning on sustainable firm performance: Intervening effect of organizational networking and innovation



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## ABSTRACT

This research has analyzed the role of learning in an organization while measuring and managing sustainable organizational performance. Furthermore, our research has also included the intervening role of organizational networking and organizational innovation while analyzing the relationship between organizational learning and sustainable organizational performance. Our research has adopted a quantitative approach while using the survey method to collect data from 710 owners of the manufacturing sector belonging to the Small and Medium Enterprises SMEs operating in Laos. Informed consent was obtained from all participants for your research. Structure equation modeling SEM was used through partial least square PLS software to test the collected data's reliability and validity and test the hypothesis to meet the research objectives. The study's findings reveal that organizational learning is vital to organizational performance and success. Information sources (networks) moderate the relationship between innovation and organizational performance. Our findings confirm that innovation is disruptive if it is not well-informed and well-processed. The research concludes that organizational learning is very vital for sustainable organizational performance. The current research contributes to the body of knowledge by examining sustainable organizational performance from an entirely different perspective.

## 1. Introduction

Achieving sustainable organizational performance is the prime objective of every organization. Achieving performance depends upon the critical performance indicators referred to as objective measures and is considered problematic [1]. Sustainability nowadays is considered a vital element in gaining a competitive advantage and improving the innovative capacity of organizations [2]. Managing and sustaining organizational performance has been one of the utmost important issues of organizational studies for decades. Different

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authors define organizational performance differently in performance literature [3]. Although the authors suggest different definitions, most agree that performance can be determined by how efficiently and effectively a firm makes the most out of the least resources in given circumstances. Organizational outcomes are being measured on both the financial and non-financial yardsticks. The financial performance indicators are; return on investment, return on equity, sales volume, profit margins, and profit-to-revenue ratios. In contrast, the non-financial indicators of performance are internal customer/employee satisfaction, external customer satisfaction, environmental performance, and social performance.

Sustainable organizational performance depends upon the organizational ability to cope with the challenges of the internal and external environment. Most of the available research has focused on dealing with the internal environment of the organization and its pertinent factors. Many researchers have highlighted the importance of strengthening internal organizational factors to improve performance. Researchers believe that as the external factors are often beyond the organization's control, managing or influencing them is beyond its locus of control. Hence, this research caters to internal and external factors, i.e., innovation, learning within the firm, learning from the external environment, and networking that can influence the firm's performance.

Organizational learning includes the collective learning of individuals and groups, but it goes beyond overall individual learning [4]. There are several ways to learn, but one of the most common organizational learning methods is rectifying errors. Organizations try to detect where it fails to fulfill customer expectations by adopting the rectification process. After identifying errors, the second stage is error correction, where innovation involves organizations trying to adopt or implement innovative ways to fix the identified errors. In error detection and fixing, the entire organization is involved. When this detection and correction process becomes a continuum, it leads the firm toward constant learning, improvement, and innovation [5]. According to the research conducted by Farrell [6], this organizational learning process helps the organization yield the required results. Organizational learning positively influences organizational performance. Organizational learning influences organizational performance as collective organizational learning is disseminated among employees to cope with the customers' rapidly changing environment and demands [7,8]. Fulfilling the rapidly changing demands of nature and customers requires innovation.

Innovation is the key to dealing with dynamic business environments by enabling them to be competitive. Innovation can exist in different forms, including product, process, technical, marketing, and organizational innovation [9]. Innovation capacity building can create value and improve performance through different types. We perceive how innovation capacity is created [10]. The innovation management process includes acquiring, disseminating, and using new knowledge [11–13] and managing innovation to enrich its capabilities [14]. Innovation helps organizations improve their performance by adopting a differentiation strategy in which organizations offer unique solutions in their final products or services to their customers. Organizations with differentiation can charge higher prices than alternate products and services available, improving organizational performance [15]. Organizational innovation is crucial, but it cannot work in isolation.

Organizations must have a strong network that includes all stakeholders and implements changes across the firm's value chain to implement organizational learning through innovative methods. Networking is the central theme of this study because no organization can work in isolation in a competitive environment. The network concept in the current research context needs further explanation before we mention its importance. Although several authors have defined the concept of network and networking, the researcher would like to take the definition provided by Hoang and Antoncic [16] as our operational definition for this research. Hoang and Antoncic [16] defined the concept of the network as "consisting of a set of actors (nodes) and a set of relationships (links) connecting these actors." Networking theory claims that only those businesses can succeed in the current competitive business environment, attaining more and more resources through their networks. Organizations cannot take all the resources under their control because every organization has limited resources, so it is better to pool all the resources from the network and make them available to all network stakeholders [17].

### 1.1. Research gap

March and Sutton [18] highlighted that clarity on the conception is necessary before measuring performance. Researchers have studied organizational performance from multiple angles. Shanker, Bhanugopan [19] studied the role of innovation in organizational performance. In contrast, Shin and Konrad [20] have discussed the role of a high-performance work system in organizational performance. The importance of risk management in managing performance was discussed by Ref. [21]. Big data and data-driven supply chain management are essential to managing organizational performance, as highlighted by Refs. [22,23]. Although the researchers have highlighted the importance of networking and innovation in performance literature, we hardly find studies examining the underlying mechanism (intervening) role of innovation and networking in organizational performance. SMEs are the highest growth sector of Laos, contributing 60%–65% of the total jobs in Laos [24]. However, very little research was conducted on SMEs, especially on learning and networking. SMEs in Laos and other developing countries have minimal resources and have different market conditions than the developed countries [25]. This research addresses the gap and contributes to the literature in developing countries, especially Laos. Based on the above discussion, current research is prone to achieve the following objectives

- The first objective of the current study is to explore the nexus between organizational learning and a firm's performance.
- The second objective is to inspect the impact of organizational learning on organizational innovation.
- The third objective is to investigate the impact of organizational innovation on firm performance.
- The fourth objective is to observe the mediating role of organizational innovation in the relationship between organizational learning and firm performance

- The fifth objective is to study the moderating role of organizational networking in the relationship between organizational innovation and firm performance.

## 2. Literature review and hypothesis development

This research investigates the impact of organizational learning on firm performance in the presence of organizational innovation and networking. This section provides detailed insights into the concept of performance, where it emerges from, and where it currently stands. This section discusses the available literature on the variables of current research, i.e., firm performance, networking, innovation, and organizational learning, and explains their relationship with each other.

### 2.1. Organizational learning and firm performance

Organizational practical functionality demands two kinds of performance. First is task performance, which refers to the tasks that directly come under an employee's job description and help manufacture end products or services. The second is a contextual task that is not the employee's actual work but makes up the social and psychological environment of the employee [26]. The organization's performance determines how effectively it works on the goals and objectives they have specified. Research on measuring performance has gone through many phases over the last few years. Initially, some researchers believed that only financial performance was essential [27,28]. Recent research has highlighted that non-financial indicators are as important as financial performance. It might stand for financial performance [29], market performance [30], customer performance [31], or overall performance [32]. Current research only considers the non-financial performance of the organizations. Several factors can influence organizational performance.

Organizational learning is one element that deals with the firm's internal and external aspects. Learning is a process in which organizations make inferences from the external environment and process the information to transform the organizations according to the demands of the external environment [33]. Organizational learning positively influences the firm's performance [6,34,35]. Zhao, Li [36] address the association of organizational learning with organizational performance. They argued that organizational learning generates new acquaintances that help organizations address the ever-changing industrial and consumer needs. Based on the above literature, researchers have proposed that.

H1: Organizational learning positively influences the organizational performance.

### 2.2. Organizational learning, innovation, and firm's performance

Organizational performance is challenging to measure. Different researchers have made several attempts to measure organizational performance. Objective performance measures include financial data such as financial outcomes, profit-making, and return on investment. Furthermore, subjective performance measures include non-financial information such as customer satisfaction, social performance, employee satisfaction, and environmental performance of the organization [37,38]. It is essential to mention getting real-time financial data from organizations, especially small and medium enterprises. SMEs are complicated, as they are reluctant to share their financial data. At the same time, it is also difficult to compare SMEs from the manufacturing and service sectors due to prevailing differences among them, i.e., the differences can be in terms of the size of an organization or industry type. Moreover, financial standards are used for reporting and measurement [39].

Apart from financial and non-financial indicators, organization performance can be measured or judged through the satisfaction of different stakeholders, including customers and employees [40]. Most studies on innovation and organizational performance are from developed countries where economic and environmental situations differ from developing countries. Mitroulis and Kitsios [41] emphasized a firm's strategy for sustainable performance. They found that firms need to develop a strategy for gaining knowledge about current market situations by investing resources in market intelligence. Then comes innovation management, the process through which organizations generate new products and services, bring novelty to their business, and initiate innovative management and marketing strategies. An innovation strategy can be more valuable if implemented through market orientation and differentiation [42].

Many researchers linked innovation with organizational performance and concluded a positive relationship [43–46]. However, most researchers believe that innovation is related to developing new products. Different sustainability concepts have widened the scope for measuring sustainability, but there is a lack of consensus via specified reporting standards. It is necessary to simplify and conceptualize sustainability to measure it. Innovation has multiple aspects, i.e., product, service, and process innovation. Research has defined innovation as new or improved products, but the term "new" or "improved" is purely relative and subjective, having a vague connotation. For instance, new might be perceived as something new to one consumer or organization but not necessarily to others. So every consumer and organization may understand innovation differently and might not be identical [47,48].

Innovation is a process that helps organizations achieve or sustain organizational performance. Learning about innovation, new technologies, and new ways to implement those technologies in innovative ways can lead the organization toward sustainable organizational performance [49]. This research considers that every aspect of innovative technological, product, and process innovation, under its ambit, matters for organizations like every type of innovation. Organizational learning can only be valuable if the organization is innovative enough to comprehend that learning and put it into practice to attain a new level of performance [50]. Current research hypothesizes that innovation can be the best mediator in the relationship between organizational learning and performance. Based on the literature mentioned above, current research proposes the following hypotheses.

H2: Organizational learning impacts the organization's innovation.

H3: Organizational innovation impacts the organizational performance.

H4: Innovation mediates the relationship between organizational learning and firm performance.

2.3. Organizational networking, innovation, and sustainable firm performance

An organizational network refers to direct or indirect relationships or business organizations exchanging commodities, services, and information [51]. Although networks and networking are not the core domains of management or social science, these concepts were borrowed from brain sciences, first by computer scientists and later by management science. Understanding networks and the organizations embedded in them is quite an uphill task, but it is necessary and interesting to point out how organizations can benefit from their networks. Over the last two decades, the organizational focus has shifted from dealing with internal issues to inter-organizational relationships. Finally, it comes to a point where organizations now understand the importance of business networks [52]. In business networks, organizations have direct business relationships between two or more organizational actors. This inter-organizational relationship helps the entire organization follow this network’s ambit to benefit from it.

However, business relationships cannot survive isolation as they expand and demand time. Businesses are interconnected and aggregated in networks where more significant firms are embedded and several other actors are involved. Organizations can learn from the firms engaged in their extended networks. The networked organization’s learning will eventually help the organization measure and manage organizational performance [53]. Organizational networking is a new field/area of research, especially in management science literature, which needs more attention [54]. Networking has its roots in other disciplines, i.e., biological and computer sciences; it will be correct to mention here that only a few researches are available on this topic in conjunction with its application to management sciences. Limited researches are available that talks about networking management linked with the external environment of the organizations and deals with organizational competence and relationships. Ford and Håkansson [55] define organizational networking as “the efforts of individual managers to influence the content and direction of the interaction between them,” and they further argued that these efforts are known as “conscious attempts to affect interaction” (p. 197). Ebers [56] also defines organizational networking as “a particular form of organizing or governing, exchange relationships among organizations” (p. 4).

Ford and Håkansson [55] reiterate that organizational networking is conscious and serves a particular purpose; organizations in a network should agree to achieve a common goal. Therefore, researchers can extract that organizational networking is cumulative behavior utilized to mobilize and understand the network’s environment. This understanding helps organizations utilize their resources and innovative capabilities to enhance performance. In the previous sections, we have already addressed that organizational learning and innovation are critical indicators for enhancing organizational performance. Acquah [57] argued that more extensive networks could bring new and significant organizational opportunities.

On the other hand, close contacts in a small network probably have already reached a saturation stage of the information. Learning from an organizational network is the most crucial element that an organization can explore or utilize to manage its performance better, which is difficult to achieve if an organization has a small network. On the other hand, there are some privacy issues regarding the organizations’ strategic information [58]. Significantly less research has explored the role of organizational learning (learned from the networks) in organizational performance. Organizational networking enhances the relationship between innovation and organizational performance because organizations can only employ innovation to understand their networks comprehensively. Without understanding the organizational network, it is challenging for a single organization to implement any change or innovative way of production, as implementing any innovation has a connection with other firms in the networks. The dynamic and flexible nature of the organizations can strengthen learning and adapt to changes. All the network actors can cope with the innovation implemented by the

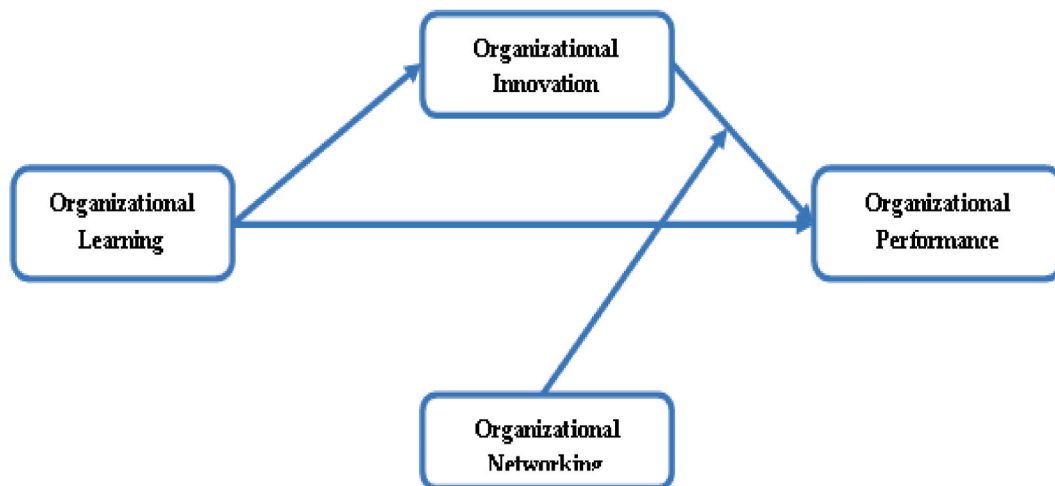


Fig. 1. Theoretical framework. Source: Author’s Contribution

organization. Based on our understanding of the role of organizational networking in enhancing organizational performance, this research has tested the following hypothesis.

H4: organizational networking moderates the relationship between organizational innovation and firm performance.

### 3. Theoretical Framework

Organizational learning theory is a comprehensive theory that deals with individuals and organizational factors influencing organizational learning. This theory explains how organizational learning helps organizations explore, acquire, and utilize new knowledge to implement innovative processes and practices in organizational settings to enhance a firm's performance [59]. Current research draws inferences from the learning theory's Social Learning/Behavior Modeling, and the framework is appended as Fig. 1. Because researchers believe that learning, whether individual, group, or organizational, is a social process that involves the human being, and learning is not possible in isolation. Learning comes from their stakeholders, whether consumers, suppliers, or competitors. All these stakeholders interact to construct meaning and knowledge about action-outcome relationships and the effects of the organization's context. It is also possible that sometimes learning is not observable, such as learning that leads to decisions not to change. Individuals in organizations learn in a social context from others with prior learning and accrued knowledge embedded in that context. Therefore, organizational learning is an aggregate, more than the sum of what individuals know and learn, and it can persist well beyond the tenure of individuals. Learning may be captured in explicit and encoded formal policies and procedures, information and data collection systems, or less explicit forms likened to reservoirs in an organization's memory, informal communication channels, culture, and behavioral norms.

### 4. Materials and methods

Current research is quantitative, and data was collected and analyzed, a hypothesis was developed, and outcomes were using numerical/empirical data. Following the positivist paradigm, current research adopted a quantitative approach. The quantitative research approach is more valuable and efficient for testing the set hypothesis as it enables the researcher to investigate and validate the objectives and research assumptions with the help of research questions followed by a hypothesis and explains the characteristics of a larger population with the help of sample data.

#### 4.1. Population and sampling

Small and medium enterprises contribute 40% of Laos's GDP, but very little research is available that has considered these SMEs [60]. So current research tried to address this gap by targeting SMEs in Laos, especially manufacturing-related ones. Choosing sample size and sampling technique depends on the study type, financial resources, time constraints, and the information available about the research problem [61,62]. Current research uses convenience sampling, and researchers contacted the SMEs through personal contacts, and some agreed to participate in the research. We distributed a total of 1200 self and email-administrated questionnaires consisting of 100 items through emails and personal visits where it was possible. Informed consent was obtained from all participants for your research. We got back 750 out of those 1200 distributed questionnaires with a response rate of 62.5%. Researchers found that only 710 out of those 750 questionnaires were useable because some of the questionnaires contains missing values.

#### 4.2. Data collection

The questionnaire is considered a reliable source for data collection compared to interviews as there are fewer chances of biasness due to the researcher's judgment in the study [63]. This research ensured that learning through the shorter version of the DLOQ with 21 items was adapted from Ref. [64] and has seven sub-dimensions, i.e., continuous learning, inquiry and dialogue, team learning, embedded systems, empowerment, systems connection, and strategic leadership. A questionnaire was adopted [65] To measure organizational networking, containing eight sub-constructs and 31 items. A sample item is "In case of any problems, you go to the members of your research group for advice."

The instrument adapted from Ref. [66] consists of 33 items, i.e., "(the leaders of this organization tend to uphold new ways of doing things)." to measure organizational innovation. Organizational performance was measured through the instrument adapted from Ref. [67]. Current research only considers non-financial measures consisting of 16 items.

### 5. Results

Smart-PLS software used the structural equation modeling technique for data analysis through the two-stage method (Hair Jr et al., 2016). The first stage analyzes the collected data from a validity and reliability standpoint. Once data is checked for reliability and validity, the next stage assesses the structural model. The first stage is the measurement model, while the second is the structural model. PLS-SEM is a relatively new structural equation modeling software with criteria to evaluate reliability, validity, and model fit.

#### 5.1. Normality test

Table 1 shows that the SMEs who responded to the questionnaire have a higher level of organizational learning. The mean values of

all the indicators relating to the organizational learning construct are significantly closer to 4 or above this level. It also appears that all the standard deviations of the questionnaire items are less than 1, which indicates slight variations in the respondents' answers to the questionnaire items. However, when the distributions of the indicator items are concerned, as shown in Table 1, some appear to deviate from normality since their skewness and kurtosis statistics are not within the cut-off values of  $\pm 1$ .

## 5.2. Measurement model

The first step in assessing the measurement model is to check the indicator's factor loading to ascertain the construct's convergent validity, following the recommendations (Hair Jr et al., 2016; Trochim, 2005). Factor loading equal to or greater than 0.70 is

**Table 1**  
Normality test.

Indicator Item	Loading Value	Mean	Standard Deviation	Excess Kurtosis	Skewness
AOI_2	0.766	3.932	0.959	0.781	-0.901
AOI_3	0.836	3.948	0.958	1.193	-0.992
AOI_4	0.820	3.988	0.980	2.026	-1.205
AOI_5	0.810	3.976	0.938	1.472	-1.003
AOI_6	0.782	3.916	0.893	1.263	-0.900
AOI_8	0.724	3.966	0.906	1.858	-1.066
BCC_2	0.730	4.010	0.852	0.752	-0.700
BCC_3	0.743	4.046	0.812	1.242	-0.803
BCC_4	0.685	4.032	0.774	1.215	-0.730
BCC_7	0.687	4.084	0.815	2.440	-1.021
BCC_8	0.733	4.028	0.867	2.022	-1.034
BCC_9	0.719	4.014	0.816	1.230	-0.757
BCC_11	0.730	3.970	0.847	1.928	-0.934
BCC_12	0.715	4.016	0.802	1.770	-0.775
BCC_13	0.703	4.012	0.855	1.901	-0.965
BCC_14	0.750	4.012	0.822	3.104	-1.105
INF_1	0.732	4.074	0.854	1.930	-1.013
INF_2	0.815	4.038	0.870	1.303	-0.897
INF_3	0.808	4.042	0.844	1.329	-0.841
INF_4	0.773	3.962	0.856	2.669	-1.117
INF_6	0.745	3.926	0.870	0.911	-0.734
INI_2	0.729	3.968	0.848	0.945	-0.709
INI_3	0.688	4.018	0.788	1.110	-0.646
INI_4	0.695	3.954	0.825	0.473	-0.580
INI_5	0.709	3.934	0.930	1.495	-0.885
INI_6	0.751	4.062	0.847	0.653	-0.751
INI_7	0.656	4.044	0.836	2.154	-0.970
INI_8	0.765	4.028	0.836	0.542	-0.650
INI_9	0.763	4.002	0.845	0.781	-0.722
INI_10	0.714	3.994	0.814	0.042	-0.481
INI_11	0.723	3.954	0.869	1.022	-0.790
INI_12	0.652	3.948	0.863	0.772	-0.685
INV_1	0.624	3.990	0.821	1.639	-0.895
INV_3	0.691	3.972	0.819	0.855	-0.736
INV_5	0.668	4.052	0.811	0.410	-0.660
INV_6	0.682	4.004	0.856	1.138	-0.873
INV_7	0.738	4.086	0.819	-0.484	-0.511
INV_8	0.718	4.068	0.759	-0.278	-0.390
INV_9	0.772	4.036	0.819	1.598	-0.877
INV_10	0.755	4.004	0.800	0.407	-0.595
INV_11	0.754	3.948	0.825	1.726	-0.866
INV_12	0.726	3.970	0.803	0.946	-0.666
INV_13	0.707	3.970	0.793	1.117	-0.646
INV_14	0.686	4.010	0.826	0.793	-0.745
INV_15	0.725	3.974	0.837	0.837	-0.750
FPM_1	0.724	3.792	1.032	0.235	-0.802
FPM_2	0.742	3.960	0.789	0.961	-0.664
FPM_3	0.743	3.982	0.840	1.265	-0.778
FPM_4	0.772	4.006	0.773	1.612	-0.817
FPM_5	0.756	3.982	0.813	0.553	-0.638
FPM_6	0.771	4.014	0.809	0.497	-0.617
FPM_7	0.813	4.032	0.834	0.702	-0.746
FPM_8	0.757	4.060	0.790	0.318	-0.619
FPM_9	0.783	4.004	0.867	0.654	-0.783
FPM_10	0.763	4.054	0.756	0.930	-0.676
FPM_11	0.737	4.066	0.781	1.571	-0.849



satisfactory; however, factor loading between 0.40 and 0.70 is acceptable (Hair Jr et al., 2016). recommend not to include the items having outer loading less than 0.4.

Subsequently, we retain items with factor loading between 0.40 and 0.69 as the average variance extracted (AVE) is more significant than 0.50 for content validity (Hair Jr et al., 2016; Hair et al., 2011). The results are in Fig. 2 and Table 3.

Table 3 shows that Cronbach’s alpha for all variables is more significant than 0.7, except for the organizational network of 0.574; it is also acceptable because its composite reliability is higher than 0.7. Its AVE value is also higher than the standard value of 0.5, which means the data is reliable for further analysis.

The current study has tested the collected data from discriminant validity by applying the recommended method, Fornell Larcker and HTMT. In the Fornell Larcker method, the validity standard is that the table’s diagonal values should be higher than all other values. Results ascertained in Table 2 are fulfilling the essential criteria. According to the HTMT method, no value should be more than 0.90. Hence our collected data is validated from both types of tests.

### 5.3. Structure model

After screening the data for reliability and validity, the second stage tests the structural model for relationships mentioned in the previous sections. A four-step process was adopted to test the structural model (Henseler et al., 2015; Hair et al., 2017, 2011; Hair Jr et al., 2016). The first step is to calculate the value of R<sup>2</sup> for each latent variable; R<sup>2</sup> is the coefficient of determinant that indicates how much variance in a variable is due to the independent variables linked to it in a structural model (Ahmed et al., 2019; Hair et al., 2011; Hair Jr et al., 2016; Hair et al., 2019). (Chin, 1998) recommends threshold values for R<sup>2</sup> as 0.19 (weak), 0.33 (moderately strong), and 0.67 (substantially strong). To test the change in R<sup>2</sup> is essential as a specified exogenous construct is omitted from the structural model and evaluate whether the omitted construct significantly impacts the endogenous construct.

Moreover, Stone-Geisser’s (Stone, 1974; Geisser, 1974) Q Square was also calculated through blindfolding for the out-of-sample prediction power of structural model assessment. “In PLS-SEM, Q<sup>2</sup> value of greater than zero for a specific endogenous reflective construct indicates path model’s predictive relevance for a particular dependent construct, and when the structural model shows predictive relevance, it accurately predicts data not used in model estimation” (Hair Jr et al., 2016). The value of Q<sup>2</sup> above the level of 0, 0.25, and 0.5 indicates small, medium, and significant predictive relevance, respectively.

f-square is effect size (≥ 0.02 is small; ≥ 0.15 is medium; ≥ 0.35 is large). f-square measured variance explains each exogenous variable in the models.

Q-square is predictive validity, measured whether your model has predictive validity (>0 is good).

Table 5 revealed that organizational learning and firm performance are positively associated; the relationship’s P-value is also significant <0.05. The confidence interval value also does not contain zero as both are positive.

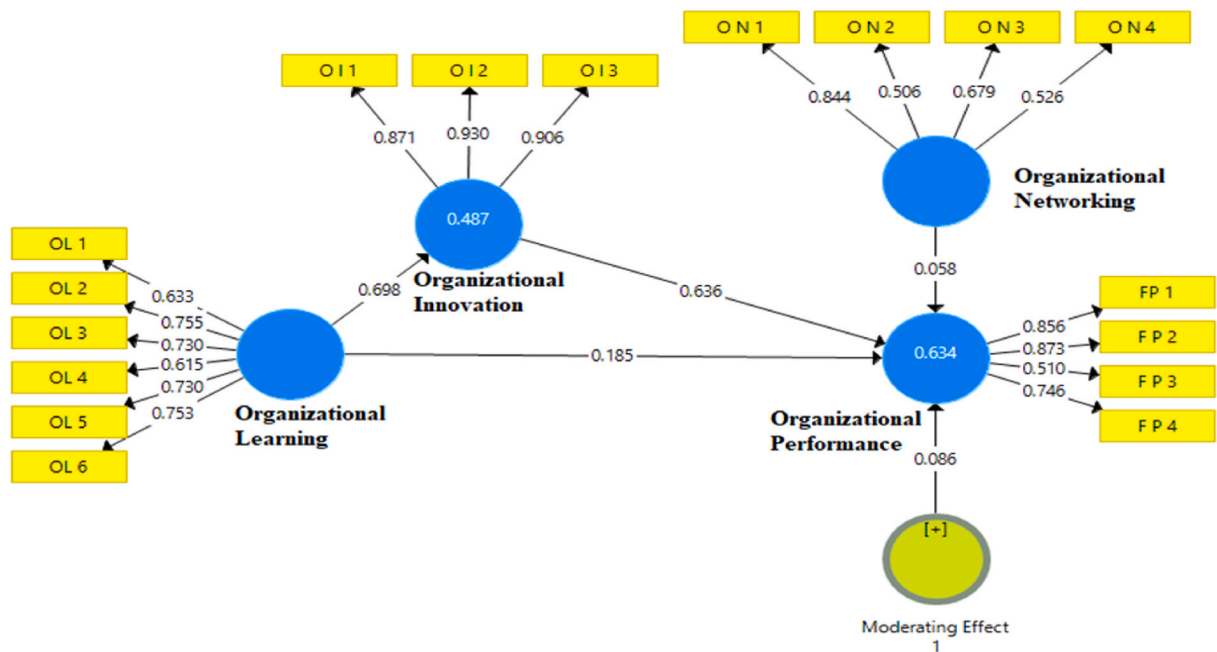


Fig. 2. Measurement model. Source: Author’s Contribution

**Table 2**  
VIF values for determining collinearity among constructs.

	INV	NTW	ORL
FPM	2.679	1.530	2.926
INV		1.525	1.866
OL		1.000	1.000

**Table 3**  
Internal consistency.

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Firm Performance	0.746	0.808	0.841	0.578
Organizational Innovation	0.886	0.887	0.93	0.815
Organizational Learning	0.817	0.848	0.855	0.497
Organizational Networking	0.574	0.63	0.74	0.526

Source: Author's Contribution

### 5.4. Hypothesis testing

After checking for collinearity issues and model strength and quality, the next stage is to test the Path coefficients and their significance through bootstrapping following the guidelines (Hair Jr et al., 2016). The researcher accepted all the direct hypotheses based on their explanation power, significance value, and confidence interval value.

Table 4 (direct hypothesis testing) revealed that organizational learning positively correlates with firm performance. After testing the direct relationship between independent and dependent variables, the next step was to test the mediating role of innovation in the relationship between organizational learning and firm performance. To test the mediation, we again run the structural equation modeling; the results for mediating hypothesis are in Table 7.

Table 5 indicates that the indirect effect (impact of organizational learning on firm performance in the presence of organizational innovation) is way more significant than the direct impact of organizational learning on firm performance. There are three conditions to believe that a variable mediates the relationship. The first condition is to check whether there is any difference between indirect and direct effects. Indirect effect OL -> OI -> FP = 0.443, which is way higher than the direct effect OL -> FP = 0.185, which means that it fulfills the first condition of the mediation test. The second condition is to check whether there is a zero between the lower and upper limit confidence intervals. In the present study, at CI 2.50%, the value is 0.342, and at CI 97.50%, the value is 0.556; both the values contain positive signs, which means zero does not exist in the lower or upper value of the confidence interval. It means that it also fulfills the second condition of mediation. The third condition checks whether the indirect and direct effects are significant or insignificant. In the current research, both indirect and direct effects are significant. That means it also fulfills the third condition of the mediation test, so we can claim that organizational innovation acts as a complementary partial mediator in the relationship between organizational learning and firm performance.

The final stage of structural modeling tests the moderating effect of organizational networking on the relationship between organizational innovation and firm performance. The results of the moderation analysis are in Table 8 and Fig. 3.

The organizational network is an important aspect that cannot be ignored, especially in technological innovation, where resources are sacred. Every organization competes for those resources that ultimately lead the organization toward superior organizational performance. According to the results, a firm can only perform well if it connects with its stakeholders. Although organizational learning and innovation play an essential role in managing a firm's performance, networking plays a vital role in its performance. This study has tested organizational networking as a moderator in the relationship between organizational innovation and firm performance. As shown in Fig. 3, the slope for the relationship is positive, and it is not cross each other; Organizational networking has a positive significance in affecting the relationship between firm performance and innovation. We examine the proportion of the valid endogenous variable's variance that this approach can explain to examine the prediction accuracy. Above mentioned figure and the table are the output of the moderation test through the multiplication method. Our research reveals that organizational networking is influencing the said relationship. So, researchers can claim that an organizational network is crucial to managing a firm's performance.

**Table 4**  
Discriminant validity.

	Fornell Larcker				HTMT			
	FM	OI	OL	ON	FM	OI	OL	ON
Firm Performance	0.76							
Organizational Innovation	0.771	0.903			0.829			
Organizational Learning	0.66	0.698	0.705		0.697	0.718		
Organizational Networking	0.327	0.27	0.498	0.653	0.454	0.367	0.746	

Source: Author's Contribution



**Table 5**  
Coefficient of determination.

	R Square	R Square Adjusted	F square	Q square
Firm Performance	0.634	0.628		0.337
Organizational Innovation	0.487	0.485	0.143	
Organizational Learning			0.038	0.347
Organizational Networking			0.017	0.375

Source: Author’s Contribution

**Table 6**  
Hypothesis testing for direct relationship.

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values	2.50%	97.50%	Decision
OL - > FM	0.185	0.187	0.066	2.813	0.005	0.531	0.745	Accepted
OL - > OI	0.698	0.701	0.039	17.773	0	0.539	0.715	Accepted
OI - > FP	0.636	0.632	0.055	11.647	0	0.609	0.76	Accepted

Source: Author’s Contribution

**Table 7**  
Hypothesis testing for mediating relationship.

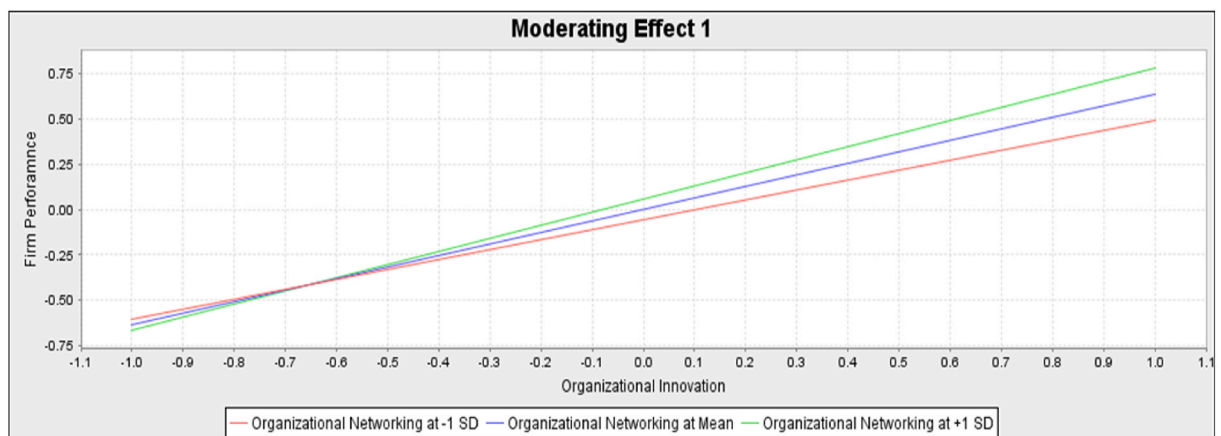
	Indirect Effect	T Statistics	P Values	2.50%	97.50%	Direct Effect	T Statistics	P Values	2.50%	97.50%
OL - > OI - > FP	0.443	7.969	0.000	0.342	0.556	0.185	2.813	0.005	0.531	0.745

Source: Author’s Contribution

**Table 8**  
Hypothesis testing for moderating relationship.

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values	2.50%	97.50%
OI*ON- > Firm Performance	0.186	0.183	0.14	2.144	.002	.009	.172

Source: Author’s Contribution



**Fig. 3.** Moderating effect slope.  
Source: Author’s Contribution

**6. Discussion**

Considering this test researcher can claim that “organizational learning and firm performance are strongly associated,” which was the study’s first hypothesis, so the researcher can claim that hypothesis one of the studies is accepted. This result is consistent with those [68,69].

The study also revealed that organizational innovation influences the firm’s performance by 63%. The result is significant at a 95% confidence level as  $P < 0.05$ , and the confidence interval contains no zeros. Hence, based on the test results, the researcher claims that

the second hypothesis of this research, “organizational innovation has a positive impact on firm’s performance,” is accepted according to the results mentioned in Table 4. Current research confirms the claim made by Refs. [70,71] that organizational innovation and firm performance are positively associated.

The last direct hypothesis, “organizational learning has a positive impact on organizational innovation,” is also accepted in light of the results shown in Table 4. The  $P$ -value is less than 0.05, and the confidence interval also does not contain any zeroes, but the power of explaining the relations is still meager. Based on the literature, the current study takes organizational innovation as a mediating variable in the relationship between organizational learning and firm performance as the indirect effect  $OL \rightarrow OI \rightarrow FP = 0.443$ , which is way higher than the direct effect  $OL \rightarrow FP = 0.185$ . The relationship’s confidence interval should not contain zero, and significance should be there ( $P < 0.05$ ). So, researchers can claim that “*organizational innovation mediates the relationship between organizational learning and firm performance.*” In light of the results, researchers could also accept Hypothesis 4.

Fig. 3 and Table 6 depict that organizational networking enhances the said relationship; organizational networking significantly explains the variance in a firm’s performance. So researchers can claim that hypothesis 4, “*Organizational networking moderates the relationship between organizational innovation and firm performance,*” is also accepted.

Most sustainability studies are on the manufacturing sector; however, very few evidence is from the services industries [72–74]. Results of the current study show that organizational learning is significant for organizational performance. Innovation can only be achieved and implemented in organizations if the organization has a very well-connected organizational network.

### 6.1. Implications

The researchers conclude that organizational learning is essential for organizational performance. Current research also extracted that the information and the source of information, i.e., organizational networks, play a significant role in organizational performance. This study tried to measure the firm’s performance while considering only non-financial measures, i.e., internal customer/employee satisfaction, external customer satisfaction, environmental performance, and social performance. So, organizations must choose wisely which network they should be a part of and how much information they need to take from which network to play a positive role in organizational performance. Organizations must sense the opportunities and implement innovation to exploit the opportunities to perform well in the future. Researchers can further extend and study the role of information in developing sustainable performance and sustainable organizations.

Comprehensive assessment of information, as a source of decisions on the development of an organization, profitability indicators of individual projects should also be taken into account. However, economic considerations ultimately define the decision-making processes regarding implementing innovations. Moreover, financial factors related to investments will play a more significant role in the SME sector than in large corporate organizations, which are often more prone to investment risk due to having more capital. However, this issue requires additional research to define financial ratios concerning non-financial factors, as this paper describes.

### 6.2. Limitations and future research

Due to the research’s resources, time, and limited scope, current research only collected data from the owners of the manufacturing small and medium enterprises SMEs in Laos. Service sector SMEs may have different working mechanisms, so researchers are encouraged to explore SMEs’ service sector. Future researchers are welcome to explore and expand the research across borders and have comparative research on SMEs sharing the same characteristics in developing countries.

An important factor for further examination is the comparison of similar characteristics of organizations from the SME sector in developed countries to those proposed in this study. Further research may also include companies from large sectors governed by other ways of operating, largely more automated and standardized, which may affect the results obtained.

## 7. Conclusion

Measuring, managing, and sustaining organizational performance is complex, and this has been a long-lasting issue yet to be fully explored by researchers and the management of organizations. The current research study has taken organizational innovation as a mediating variable between organizational learning and firm performance. If not converted into innovative practices and operations, organizational learning cannot help organizations achieve high performance. Organizational performance plays a decisive role in business success. Many factors affect organizational performance, such as market share, sales volume, profits, and internal factors, including organizational system improvements.

There are different approaches to measuring organizational performance. Innovation at the organizational level, including innovation in terms of new product/service development, organizational and marketing innovation, knowledge development, creative capabilities, and enhancing origination performance through innovation by differentiation, are a few organizations undertaking this. Current research measures organizational performance through organizational learning through innovation and networking. The current research finding suggests that organizational learning is essential to organizational performance. Learning from external networks and implementing that learning within the organizational network in innovation leads an organization toward better performance. Current research empirically tested the role of learning from external networks and implemented that learning in innovation within organizational networks facilitates better performance. Current research highlights the role of manufacturing SMEs in Laos as these SMEs significantly contribute to Laos’s GDP. Researchers can extend the study to other developing countries most likely share similar characteristics.

## Author contribution statement

Anna Hnydiuk-Stefan: Contributed reagents, materials, analysis tools or data. Phoungphaynome Inthavong; Khaliq Ur Rehman: Conceived and designed the experiments; Wrote the paper. Khansa Masood; Samrat Ray: Analyzed and interpreted the data. Zeeshan Shaikat: Performed the experiments.

## Data availability statement

Data will be made available on request.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## References

- [1] K.U. Rehman, et al., Impact of entrepreneurial leadership on product innovation performance: intervening effect of absorptive capacity, intra-firm networks, and design thinking, *Sustainability* 13 (13) (2021) 7054.
- [2] B. Purvis, Y. Mao, D. Robinson, Three pillars of sustainability: in search of conceptual origins, *Sustain. Sci.* 14 (3) (2019) 681–695.
- [3] A. Mackey, T.B. Mackey, J.B. Barney, Corporate social responsibility and firm performance: investor preferences and corporate strategies, *Acad. Manag. Rev.* 32 (3) (2007) 817–835.
- [4] V.I. Sessa, M. London, *Continuous Learning in Organizations: Individual, Group, and Organizational Perspectives*, Psychology Press, 2015.
- [5] D. Jiménez-Jiménez, R. Sanz-Valle, Innovation, organizational learning, and performance, *J. Bus. Res.* 64 (4) (2011) 408–417.
- [6] M.A. Farrell, Developing a market-oriented learning organisation, *Aust. J. Manag.* 25 (2) (2000) 201–222.
- [7] S.-Y. Chien, C.-H. Tsai, Dynamic capability, knowledge, learning, and firm performance, *J. Organ. Change Manag.* 25 (3) (2012) 434–444.
- [8] J. Giniuniene, L. Jurksiene, Dynamic capabilities, innovation and organizational learning: interrelations and impact on firm performance, *Procedia Soc. Behav. Sci.* 213 (2015) 985–991.
- [9] F. Damanpour, K.A. Szabat, W.M. Evan, The relationship between types of innovation and organizational performance, *J. Manag. Stud.* 26 (6) (1989) 587–602.
- [10] A. Adriansyah, A.Z. Afiff, Organizational culture, absorptive capacity, innovation performance and competitive advantage: an integrated assessment in Indonesian banking industry, *The South East Asian Journal of Management* (2015).
- [11] S. Sindakis, F. Kitsios, Entrepreneurial dynamics and patient involvement in service innovation: developing a model to promote growth and sustainability in mental health care, *J. Knowl. Econ.* 7 (2) (2016) 545–564.
- [12] G.D. Kitsios, et al., Can we trust observational studies using propensity scores in the critical care literature? A systematic comparison with randomized clinical trials, *Crit. Care Med.* 43 (9) (2015) 1870–1879.
- [13] D. Mitroulis, F. Kitsios, Competitive innovation strategies improving the organizational performance, in: *Proceedings of the 4th International Symposium & 26th National Conference on Operational Research*, June. 2015.
- [14] G. Gunday, et al., Effects of innovation types on firm performance, *Int. J. Prod. Econ.* 133 (2) (2011) 662–676.
- [15] A. Parnell, M. Brady, Capabilities, strategies and firm performance in the United Kingdom, *Journal of Strategy and Management* 12 (1) (2019) 153–172.
- [16] H. Hoang, B. Antoncic, Network-based research in entrepreneurship: a critical review, *J. Bus. Ventur.* 18 (2) (2003) 165–187.
- [17] S.P. Borgatti, D.S. Halgin, On network theory, *Organ. Sci.* 22 (5) (2011) 1168–1181.
- [18] J.G. March, R.I. Sutton, Crossroads—organizational performance as a dependent variable, *Organ. Sci.* 8 (6) (1997) 698–706.
- [19] R. Shanker, et al., Organizational climate for innovation and organizational performance: the mediating effect of innovative work behavior, *J. Vocat. Behav.* 100 (2017) 67–77.
- [20] D. Shin, A.M. Konrad, Causality between high-performance work systems and organizational performance, *J. Manag.* 43 (4) (2017) 973–997.
- [21] S. Durst, C. Hinteregger, M. Zieba, The linkage between knowledge risk management and organizational performance, *J. Bus. Res.* 105 (2019) 1–10.
- [22] S. Gupta, et al., Achieving superior organizational performance via big data predictive analytics: a dynamic capability view, *Ind. Market. Manag.* 90 (2020) 581–592.
- [23] S.S. Kamble, A. Gunasekaran, S.A. Gawankar, Achieving sustainable performance in a data-driven agriculture supply chain: a review for research and applications, *Int. J. Prod. Econ.* 219 (2020) 179–194.
- [24] S. Philavanh, Small and Medium-Sized Enterprises (SMEs) Difficulties and Challenges in Lao PDR, 2016. Available at: SSRN 2842492.
- [25] V.M. Pandya, Comparative analysis of development of SMEs in developed and developing countries, in: *The 2012 International Conference on Business and Management*, 2012.
- [26] J.M. Werner, Implications of OCB and contextual performance for human resource management, *Hum. Resour. Manag. Rev.* 10 (1) (2000) 3–24.
- [27] L. Teeratsirikool, et al., Competitive strategies and firm performance: the mediating role of performance measurement, *Int. J. Prod. Perform. Manag.* 62 (2) (2013) 168–184.
- [28] D. O'Sullivan, A.V. Abela, M. Hutchinson, Marketing performance measurement and firm performance: evidence from the European high-technology sector, *Eur. J. Market.* 43 (5/6) (2009) 843–862.
- [29] K.V. Lins, H. Servaes, A. Tamayo, Social capital, trust, and firm performance: the value of corporate social responsibility during the financial crisis, *J. Finance* 72 (4) (2017) 1785–1824.
- [30] F. Tao, et al., Do cross-border mergers and acquisitions increase short-term market performance? The case of Chinese firms, *Int. Bus. Rev.* 26 (1) (2017) 189–202.
- [31] G.W. Ziggers, J. Selsler, The reinforcing effect of a firm's customer orientation and supply-base orientation on performance, *Ind. Market. Manag.* 52 (2016) 18–26.
- [32] J. Yang, P. Shi, Applying analytic hierarchy process in firm's overall performance evaluation: a case study in China, *Int. J. Bus.* 7 (2002).
- [33] C. Dibrell, J.B. Craig, D.O. Neubaum, Linking the formal strategic planning process, planning flexibility, and innovativeness to firm performance, *J. Bus. Res.* 67 (9) (2014) 2000–2007.
- [34] W.E. Baker, J.M. Sinkula, The synergistic effect of market orientation and learning orientation on organizational performance, *J. Acad. Market. Sci.* 27 (4) (1999) 411–427.
- [35] T. Gonzalez-Padron, G.T.M. Hult, R. Calantone, Exploiting innovative opportunities in global purchasing: an assessment of ethical climate and relationship performance, *Ind. Market. Manag.* 37 (1) (2008) 69–82.
- [36] Y. Zhao, et al., Entrepreneurial orientation, organizational learning, and performance: evidence from China, *Entrep. Theory Pract.* 35 (2) (2011) 293–317.
- [37] C.R. Cano, F.A. Carrillat, F. Jaramillo, A meta-analysis of the relationship between market orientation and business performance: evidence from five continents, *Int. J. Res. Market.* 21 (2) (2004) 179–200.

- [38] S. Cruz-Ros, T.F.G. Cruz, C. Pérez-Cabañero, Marketing capabilities, stakeholders' satisfaction, and performance, *Service Business* 4 (3–4) (2010) 209–223.
- [39] L.V. Ngo, A. O' Cass, Performance implications of market orientation, marketing resources, and marketing capabilities, *J. Market. Manag.* 28 (1–2) (2012) 173–187.
- [40] D.A. Bosse, R.A. Phillips, J.S. Harrison, Stakeholders, reciprocity, and firm performance, *Strat. Manag. J.* 30 (4) (2009) 447–456.
- [41] D. Mitroulis, F. Kitsios, Fostering a competitive differentiation strategy for sustainable organizational performance, in: *Operational Research in Business and Economics*, Springer, 2017, pp. 85–112.
- [42] J.C. Guan, et al., Innovation strategy and performance during economic transition: evidences in Beijing, China, *Res. Pol.* 38 (5) (2009) 802–812.
- [43] J. Darroch, Knowledge management, innovation and firm performance, *J. Knowl. Manag.* 9 (3) (2005) 101–115.
- [44] S. Thornhill, Knowledge, innovation and firm performance in high-and low-technology regimes, *J. Bus. Ventur.* 21 (5) (2006) 687–703.
- [45] Z. Wang, N. Wang, Knowledge sharing, innovation and firm performance, *Expert Syst. Appl.* 39 (10) (2012) 8899–8908.
- [46] U. Lichtenthaler, Outbound open innovation and its effect on firm performance: examining environmental influences, *R&D Management* 39 (4) (2009) 317–330.
- [47] G. Duysters, B. Lokshin, Determinants of alliance portfolio complexity and its effect on innovative performance of companies, *J. Prod. Innovat. Manag.* 28 (4) (2011) 570–585.
- [48] S. Yayavaram, W.R. Chen, Changes in firm knowledge couplings and firm innovation performance: the moderating role of technological complexity, *Strat. Manag. J.* 36 (3) (2015) 377–396.
- [49] N. Balasubramanian, Y. Ye, M. Xu, Substituting human decision-making with machine learning: implications for organizational learning, *Acad. Manag. Rev.* 47 (3) (2020) 448–465.
- [50] J.R. Meher, R.K. Mishra, Assessing the influence of knowledge management practices on organizational performance, *VINE J. Inf. Knowl. Manag. Syst.* 49 (3) (2019) 440–456.
- [51] K. Möller, S. Svahn, How to influence the birth of new business fields—network perspective, *Ind. Market. Manag.* 38 (4) (2009) 450–458.
- [52] V. Ziakas, C.A. Costa, Explicating inter-organizational linkages of a host community's events network, *Int. J. Event Festiv. Manag.* 1 (2) (2010) 132–147.
- [53] P. van den Bekerom, J. Schalk, R. Torenvlied, Transforming input into output: how downward networking mediates the effect of external networking on organizational performance, *Publ. Perform. Manag. Rev.* 40 (4) (2017) 625–651.
- [54] D. Ford, S. Mouzas, The theory and practice of business networking, *Ind. Market. Manag.* 42 (3) (2013) 433–442.
- [55] D. Ford, H. Håkansson, Competition in business networks, *Ind. Market. Manag.* 42 (7) (2013) 1017–1024.
- [56] M. Ebers, Explaining inter-organizational network formation", in: M. Ebers (Ed.), *The Formation of Inter-organizational Networks*, Mark Ebers, Citeseer, 1997.
- [57] M. Acquaaah, Social networking relationships, firm-specific managerial experience and firm performance in a transition economy: a comparative analysis of family owned and nonfamily firms, *Strat. Manag. J.* 33 (10) (2012) 1215–1228.
- [58] N. Lin, Building a network theory of social capital, in: *Social Capital*, Routledge, 2017, pp. 3–28.
- [59] W. Berta, et al., Why (we think) facilitation works: insights from organizational learning theory, *Implement. Sci.* 10 (1) (2015) 141.
- [60] P. Kyophilavong, SMEs access to finance: evidence from Laos, in: *Small and Medium Enterprises (SMEs) Access to Finance in Selected East Asian Economies*, 2011, pp. 117–150.
- [61] A. Bryman, D. Cramer, *Quantitative Data Analysis with SPSS 14, 15 and 16: A Guide for Social Scientists*, Routledge, 2009.
- [62] N.W.H. Blaikie, *Designing Social Research: the Logic of Anticipation*, Polity, 2000.
- [63] A.N. Oppenheim, *Questionnaire Design, Interviewing and Attitude Measurement*, Pinter Pub Ltd, 1998.
- [64] B. Yang, K.E. Watkins, V.J. Marsick, The construct of the learning organization: dimensions, measurement, and validation, *Hum. Resour. Dev. Q.* 15 (1) (2004) 31–55.
- [65] D. De Lange, F. Agneessens, H. Waeye, Asking social network questions: a quality assessment of different measures, *Metodoloski Zvezki* 1 (2) (2004) 351.
- [66] A.I. Ismail, et al., Internal consistency and reliability of a questionnaire assessing organizational innovation in two schools of dentistry, *J. Dent. Educ.* 66 (4) (2002) 469–477.
- [67] M.L. Santos-Vijande, J.Á. López-Sánchez, C. González-Mieres, Organizational learning, innovation, and performance in KIBS, *J. Manag. Organ.* 18 (6) (2012) 870.
- [68] J.M. Namada, *Organizational Learning and Firm Performance: an Empirical Investigation in an Emerging Economy Context*, 2017.
- [69] K. Liuhto, *Organizational Learning and Organizational Performance*, *Voprosy Economiki*, 1998, p. 12.
- [70] G. Baker, et al., *Organizational Innovation and Firm Performance*, NBER Books, 2008.
- [71] A. Noruzy, et al., Relations between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance: an empirical investigation of manufacturing firms, *Int. J. Adv. Des. Manuf. Technol.* 64 (5–8) (2013) 1073–1085.
- [72] K. Hussain, R. Konar, F. Ali, Measuring service innovation performance through team culture and knowledge sharing behaviour in hotel services: a PLS approach, *Procedia-Social and Behavioral Sciences* 224 (2016) 35–43.
- [73] R. Al-Aomar, M. Hussain, An assessment of green practices in a hotel supply chain: a study of UAE hotels, *J. Hospit. Tourism Manag.* 32 (2017) 71–81.
- [74] M. Malik, S. Abdallah, M. Hussain, Assessing supplier environmental performance: applying analytical hierarchical process in the United Arab Emirates healthcare chain, *Renew. Sustain. Energy Rev.* 55 (2016) 1313–1321.