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RESEARCH PAPER

Role of Inter-Organizational Learning and Innovation in increasing the Performance of Construction Industry

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ABSTRACT

The improvement of product novelty calls for learning in inter-organizational networks with partners. Learning new knowledge and information based on innovation enhances the performances of modern organizations. This study is conducted to find out the relationship of inter-organizational learning with innovation and organizational performance. A total number of 58 construction organizations of Islamabad and Rawalpindi were taken as population of the study. The total sample size was 403. Data was analysed though SPSS. The results are authentic and all the hypothesis were accepted. The results show that independent variable drives the mediating variable that ultimately effect the dependent variable. A significant implication for researchers and business practitioners is the familiarization of the key variables inter-organizational learning, innovation and performance.

Introduction

The construction industry is a project-based industry. The employees of construction industry are required to synchronize with various workers of the completely different companies (Argyris & Schön, 1997; Calantone, Cavusgil, & Zhao, 2002; Schein, 1990; Smircich, 1983; Tsang, 1997). Pakistani construction industry faces conflicts and troubles such as adverse relationships, a complex and fragmented social system and low productivity. This can be a result of misapprehensions, lack of coordination and cooperation Marks and Mirvis (2010).

Due to the disruptively changing world, organizations are forced to produce greater value with the unique combinations. The performance, quality, innovation and customization for capacity of organizations are required to learn, acquire, apply, and spread new approaches (Duan et al., 2022). Organizations of the developed countries are using inter-organizational learning as a strategic tool for the performance (Granovetter, 1973).

Inter-organizational learning got importance in the nineteen fifties when there was an on-going discussion between behaviourists and economists (Tippakoon, Sang-Arun, & Vishuphong, 2022). Economic models of the organizations had become dominant during and after the World War II, nevertheless many researchers, mainly those with a behaviourist orientation, were not satisfied with those models (Hardt, 2001; Stella, 2012b). The focus on organizational learning was sharpened in the Behavioural Theory (Cyert & March, 1963). Organizations were then visualized as adaptive, complex system. Inter-organizational

learning was incarcerated in a learning cycle in which organizations taken action against external shocks by adjusting the probability of reusing detailed operating procedures (Schlossberg, 1981).

Many researchers (Azamela, Tang, Owusu, Egala, & Bruce, 2022; Chen, Duan, Edwards, & Lehaney, 2006; De Martino, Errichiello, Marasco, & Morvillo, 2013; Feller, Parhankangas, Smeds, & Jaatinen, 2013; Koster, 2021; LIU, HU, & KANG, 2021) suggested in their recommendations that an inter-organizational learning network is required to be developed. There are a few studies on inter-organizational learning, to know the grey area, we conducted preliminary interviews and during interviews, we investigated that there is less awareness of inter-organizational learning in the construction industry of Pakistan.

Literature Review

The majority of the research is focused on learning within organizations, little investigations address 'outside learning'. This is a path to the advance level learning in addition to entities, cluster and organizational benefits. This break in research was also recognized by Ramos (Ramos, 2011). The community specific vision of organizations towards a formation of knowledge is at an ordinary level within actual economical setting and not being given too much importance (Hall, 1997).

Inter-organizational Learning

It is the actual economical setting occurrence where combined explanation is not available (Sanders, 2008). Some scholars (Azamela et al., 2022; Beeby & Booth, 2000; Clarke & Roome, 1999; Doz, 1996; Ebers & Jarillo, 1997; Halme, 2001; Huber, 1991; Trist, 1983) understand inter-organizational learning as way of members' participation and jointly action to create combined Learning. A network-level Learning urbanized or resides within the network and that, storage space, growth and attainment which is useful in a definite system situation.

Hagedoorn, Roijakkers, and Kranenburg (2006) pointed Absorptive capacity as an organizational capability to know the importance of external knowledge, incorporate it, as well as relate it to profitable activities. Absorptive capacity is also mentioned in literature (Martín-de Castro, 2015; Mingzhi Li & Song, 2015; Tzokas, Kim, Akbar, & Al-Dajani, 2015) as an imperative base to endorse inter-organizational learning. In this admiration, claims that absorptive capacity permit organizations to convert their cognitive coldness and connect in combined learning processes (Pattinson & Preece, 2014).

Inter-organizational Learning and Performance

In the organizational studies, performance is debatably the essential concept. A vast kind of descriptions of organizational performance has been projected in the research (Neely, Gregory, & Platts, 1995) with average reference to how successfully and with ease an organization makes use of its resources for producing financial results. Performance can be defined in really plenty of methods; it might stand for financial performance, market efficiency, buyer performance or total performance.

Cohen, W.M. and D.A. Levinthal (Cohen & Levinthal, 1990) tested the relationship between Organizational Learning and performance. Organizational Performance is the aptitude of the firm to attain its pursuits and goals (Andreadis, 2009; Azamela et al., 2022; Bontis, 2001; Cohen & Levinthal, 1990; Crossan, Lane, White, & Djurfeldt, 1995; Egan, Yang, & Bartlett, 2004; Lane & Lubatkin, 1998; Love, Irani, Cheng, & Li, 2002; Sveiby, 1997; Tippins

& Sohi, 2003), it can be attained by integrating the information resources (Spanos, Vonortas, & Voudouris, 2015; Tzokas et al., 2015).

Inter-organizational Learning and Innovation

Increasingly, it has been recognized that businesses need outside relationships for innovation, within the development of recent merchandise, construction techniques, markets, or varieties of the institution, and for learning, within the progress of new expertise (Bouncken, Pesch, & Kraus, 2015; De Martino et al., 2013; Hollen, Van Den Bosch, & Volberda, 2013; Majchrzak, Rice, King, Malhotra, & Ba, 2014; Manuj, Omar, & Pohlen, 2014; Steensma, 1996).

In learning, it's usual to distinguish between learning by communiqué, i.e. the acquisition from others of potential that is already on hand, and 'experiential learning' that may generate new knowledge by way of discovery or invention. The literature on learning yields the difference between organizational and inter-organizational learning (Della Peruta, Del Giudice, Lombardi, & Soto-Acosta, 2016; Lundvall, 2016).. The former preserves an intellectual frame, normal design, good judgment or architecture, at the same time the latter breaks via to novel common ideas. A principal, key question is how the latter could emerge from the former, or how exploitation may result in exploration (Nooteboom, 2000).

Mediating role of Innovation

A Plethora of research indicates that Innovation has mediating effect on the performance of an organization. According Jimenez, D. and R. Sanz-Valle (2011) innovation has partial effect on Organizational performance. Innovation allows the organization to keep their comparatively trained workers in order that they provide high performance at the work place. Innovation is mediating impact on Organizational performance. Damanpour, F investigated (Damanpour, 1991) the mediating position of Innovation in connection with inter-organizational learning and performance. A different research explored that there are three large warning signs of Innovation create an Inter-organizational learning (Azamela et al., 2022).

Underpinning Theories of the Current Study

Learning is a multifaceted event, whether one adopts an individual or an organizational approach. Many theories explain the importance of Inter-Organizational Learning. In the previous decades, social capital in its various sorts and contexts emerges as frequently essentially the most important standards in the social sciences. These debates and clarifications involved in the recommendation that social capital, as an implication, rooted in social networks. Consequently, social capital can also regard as assets surrounded by a social constitution (Coad, Segarra, & Teruel, 2016; Hui et al., 2013; Zhou & Wu, 2014).

Materials and Methods

Research Design

A strategy for identifying the procedures and systems for gathering information and analyzing the desired data is known to be a research design (Zikmund & Babin, 2011). It states the type of study, approaches of sampling, sources of information, and methods for collection of data, dimensional problems, and knowledge evaluation plans (Kothari, 2004). Research begins with the assessment of relevant available information about an observable fact (Herbst & Coldwell, 2004). A study design is valuable if a eminence research report is formed (Sekaran, 2006; Zikmund & Babin, 2011). This study includes, Interviews with

managers, employees and stakeholders, Interviews and focus groups with learners, the direct observation of inter-organizational activities and field notes.

Theoretical Framework

The Major purpose of this section is to develop several hypotheses and a theoretical framework to answer the research questions. The research model is developed in this study to investigate the association between (a) IOL and Performance (b) IOL and innovation), (c) performance innovation and, (d) effect of innovation among IOL and performance. Figure 1 presents the model of the study.

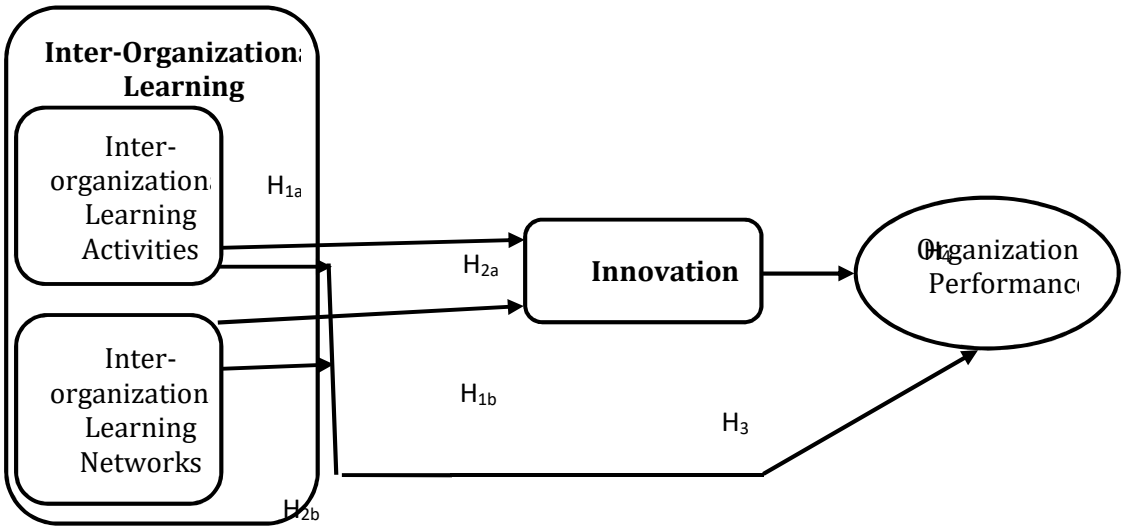

Fig 1 Model of Study

H_1a: IOLA have significant impact on Innovation.

H_{1b}: IOLA and Organizational Performance have a significant positive relationship.

H_{2a}: IOLN have positive relationship with Innovation.

H_{2b}: IOLN have positive relationship with Performance.

H_3: Innovation has positive relationship with Organizational Performance.

H_4: Innovation significantly mediates the relationship between IOL and Organizational Performance**.**

The framework comprises three elements: Inter-organizational learning, innovation and organizational performance. Within the element of inter-organizational learning, the framework proposes two key constructs: inter-organizational learning activities and inter-organizational Networks, A direct relationship of the two dimensions of inter-organizational learning witj innovation and organizational performance is proposed

Justification for the Research Design

A quantitative method was used in this study, data was collected and statistically evaluated (Bryman, 2015; Kothari, 2004). Quantitative method was used because the

research was planned to review research results using descriptive statistics, to discover the likely relationship between variables (Bryman & Bell, 2015). The effect of one construct with another was studied using SEM.

Sampling Design

It is the procedure of utilizing a slight items of a bigger population to appeal assumptions regarding the entire population (Zikmund & Babin, 2011). For this study, simple random sampling technique is used to get maximum data in short time.

Target Population

The study was conducted in the construction organizations in Pakistan situated in Rawalpindi and Islamabad and Karachi. The population for the study was consist of employees of 50 construction related organizations of Pakistan sample consists of the top and middle level employees employed in the construction industry which were approximately 2000. Sample size is determined according to the method proposed by Krejcie, R.V. and D.W. Morgan Cheng, C.C., et al (Cheng, Chen, Hsu, & Hu, 2012; Krejcie & Morgan, 1970).

Tools of the Research

To measure the effect of inter-organizational learning on performance 28 items and mediating effect of Innovation 19 item iems respectively is adapted from (Skerlavaj, Stemberger, & Dimovski, 2007) which was tested and validated by Štemberger, and V. Dimovski & Škerlavaj (2010) and (Stella, 2012a). Inter-organizational learning of the construction industry was measured through 15 items of organizational learning adopted from (Chen et al., 2006). The reliability and validity of questionnaire was tested by Lin, B.-W. and C.-J. Chen, (Lin & Chen, 2006). Questionnaire was anchored on a five point Likert scalewas used. Questionnaire was distributed to employees of the construction industry (Bowling, 2005; Hardre, Crowson, & Xie, 2010). Cronbach's Alpha value for Inter Organizational Learning Activities is .965, Networks is .950 Innovations is .983 and performance is .975, which shows a good reliability.

Data Analysis

The data was prepared by coding and editing using SPSS20.before conducting the statistical analysis. Errors were checked for possible problems that might influence the outcome of the statistical analysis.

Descriptive Statistics

The value of Inter-Organizational Learning as a whole shows the mean value 3.4840 and Std. Deviation is .716. Networks show the mean 3.4502 and Std. Deviation is .778. Value of mean against Innovation is 3.4538 and Std. Deviation is .720. Finally, Performance shows the value of mean as 3.5527 and Std. Deviation is .730.

Confirmatory Factor Analysis CFA

Number of distinct sample moments are 703. The estimation of number of distinct parameters is 88 and degree of freedom is 615. The value of Chi-Sqare also explains as 1766.216 and sig value is .000 that is again in acceptance region. Various researchers explain that value of Chi-Sqare/DF is ideal when it is less than three. Hence, in current study the value of Chi-Sqare/DF is 2.872.

One of the significant parts is to analyze data with Structural Equation Model (SEM). Especially in management science, this is one of the famous tests for analyzing models. This is model fit technique. The value of NPAR is 88, CMIN 1766.216, Degree of Freedom is 1479, value .000, and CMIN/DF is 2.731. The value of Root Mean Residual is .036, CFI .943, TLI 939 GFI .803, AGFI, .775, and PFGI .703. Thus, these values are showing the model is fit.

Measurement model

Measures

Inter-Organizational Learning Activities

This variable was measured with 10 questions. The items were adapted from (Chen et al., 2006) Internal reliability Cronbach's Alpha value for Inter Organizational Learning Activities is .965. IOL-7 and IOLA-8 were dropped because the initial model was not fit due to the high correlation of these variables with other indicators. whereas e6 and e7 correlated to achieve model fit.

Networks

This variable was measured with 10 questions. The items were adopted from (Chen et al., 2006) The value of Cronbach's Alpha for networks is .950. The initial model was fit so no alteration was made.

Innovation

This variable was measured with 18 questions. The items were adopted from (Skerlavaj et al., 2010) Internal reliability Cronbach's Alpha value for Innovation is .983. The initial model because of high correlation of INNO-26, INNO-28 and INO-29 with other indicators. Therefore, these questions were dropped. 15 indicators were left in the construct.

Performance

This variable was measured with 10 questions. The items were adopted from (Skerlavaj et al., 2010) Internal reliability Cronbach's Alpha value for Peformance is .975. The initial model was not fit because of high correlation between PER-38 and PER-39 with other indicators. Therefore, these were dropped. Finally, the construct was left with eight indicators.

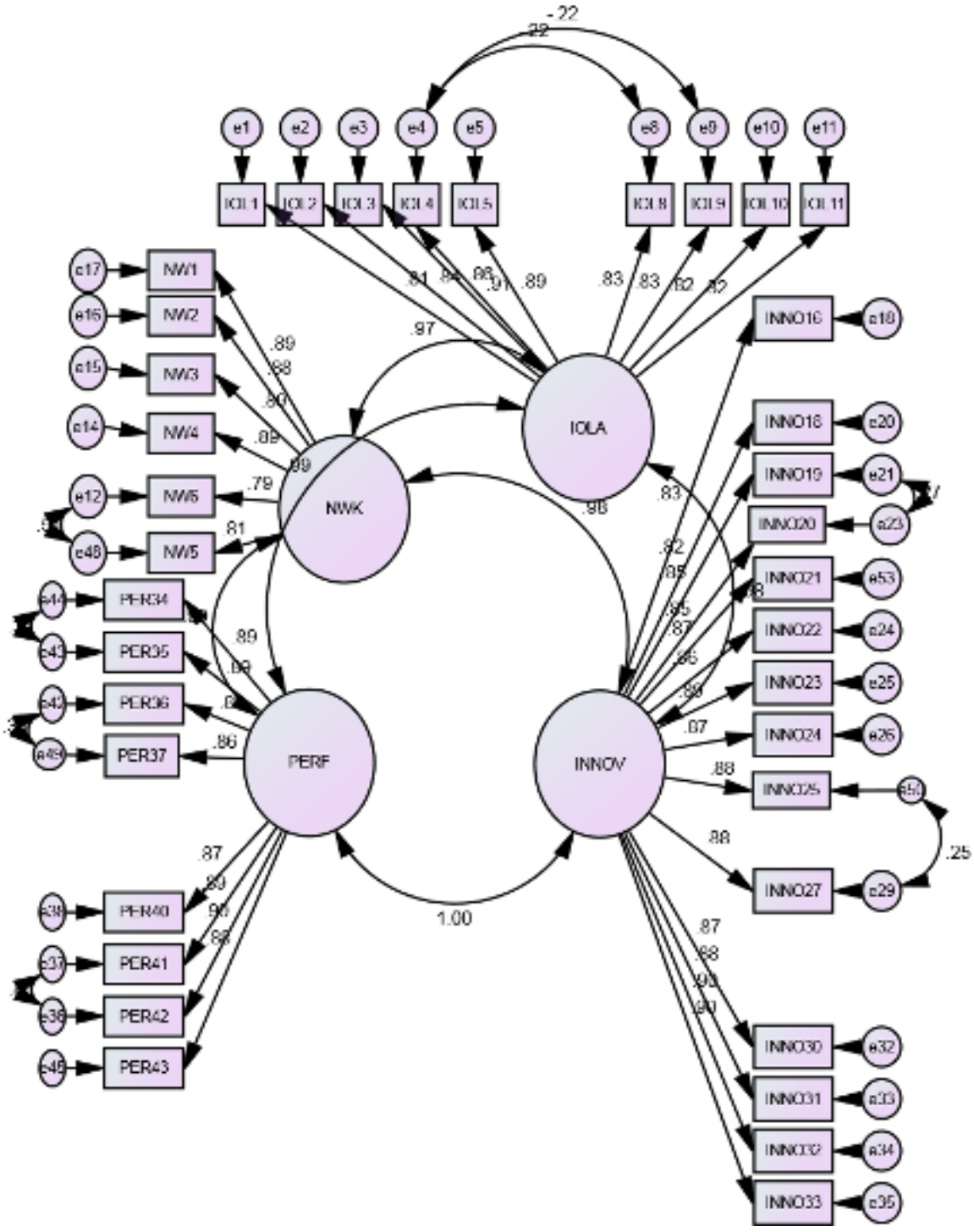

Figure 2: Measurement Model

Structural model was estimated after Analysis of the measurement model for the individual constructs. The values of Confirmatory factor analysis indicated the acceptance of the model because the goodness-of-fit indices are within the acceptable level. Different values for these indices are : chi-square is 1570.857 with 615 degrees of freedom was significant at p=0.000; GFI = 0.821; Standardized RMR = 0.035; CFI = 0.952; RMSEA = 0.062; and CMIN/DF =2.554.

Structural Model

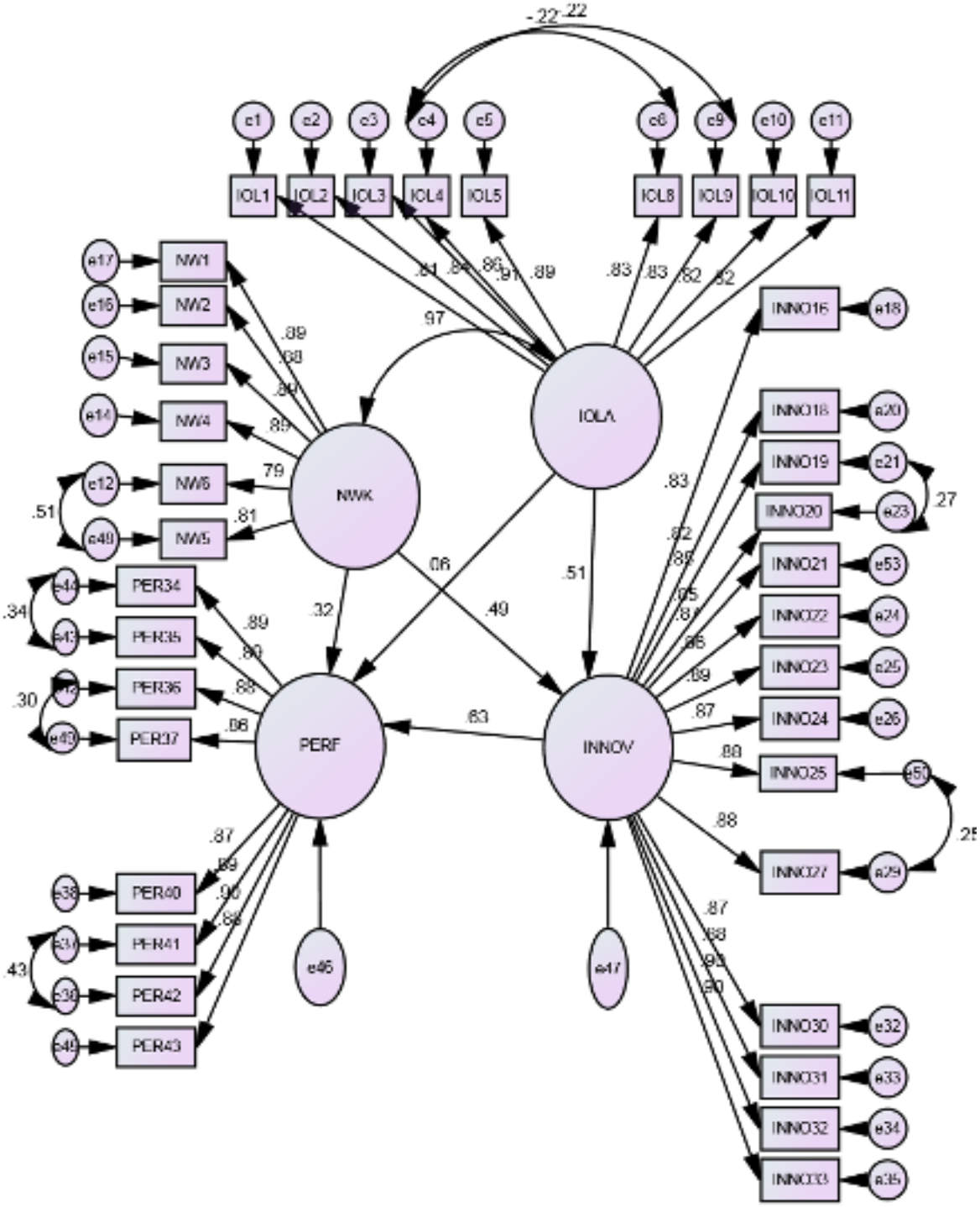

Figure 3: Structural Model

Correlation Matrix of the study

	IOLA	Innovation	Networks	Performance
IOLA	1			
Innovation	.961**	1		
Networks	.934**	.941**	1	

Performance	.953**	.967**	.940**	1

Path Coefficients among the Constructs

Variables		Coefficients
IOLA	Innovation	.51
IOLA	Performance	.06
Networks	Performance	.32
Networks	Innovation	.49

Hypotheses Testing

A plethora of research supports the positive relationship between Inter-organizational learning activities and Innovation(Westerlund & Rajala, 2010). In current model, the correlation between these variables is 0.961, whereas path coefficient between both the variables is .51, which shows the positive relationship between variables.

Inter-organizational learning activities ultimately increase the performance of the organizations (Inkpen & Crossan, 1995; Moen, Benum, & Gjærum, 2018; Westerlund & Rajala, 2010; Zollo, Reuer, & Singh, 2002). The correlation between these two variables is .953, which shows that variables are highly correlated. Path coefficient between both variables is .06, which is weak but positive.

Inter-organizational learning networks has a positive relationship with innovation (Beeby & Booth, 2000; Mintrom & Vergari, 1998; Zeng, Xie, & Tam, 2010) wherein organizations formulate, apply and monitor learning networks to provide a learning environment. The correlation between inter-organizational learning networks and innovation is .941, which is very high correlation.

Many researchers explored the relationship of inter-organizational learning and innovation (Powell, Koput, & Smith-Doerr, 1996; Tsai, 2001). Results of the study shown the correlation between both variables is .961 which is very strong enough to prove the relationship. Innovation drives the performance of the organizations. Innovation has been found main antecedent of performance. Mediating role of innovation has been discussed by (Shehzad, 2019; Sun, Liu, & Ding, 2020). Correlation of innovation with IOLA, Networks and performance is .961, .941 and .967 respectively, which shows a strong link of innovation with all the variables of the study.

Conclusion

This study highlighted the variable i.e. Inter-Organizational Learning, its effect on Innovation and Performance. The survey was conducted in the construction industry of Pakistan where employees were supposed to fill the survey forms to show their intention whether how Inter-Organizational learning and Innovation effect the performance of the organization. This was found with the help of results that Inter-Organizational Learning has positive effect on Innovation ultimately has a positive effect on the performance. All the hypothesis are accepted and both the independent and mediating variables shown a strong effect on Performance.

Theoretical Implications

Overall, the research augments to the understanding of inter-organizational learning and innovation for the increase of organizational performance. The analysis shows that construction industry organizations can perform better with these two variables i.e. inter-

organizational learning and innovation. This imitates their forthcoming plans; such organizations may change their upcoming projects by focusing on inter-organizational learning and innovation for the improvement of the organizational resources. The results are compatible with existing body of knowledge that new knowledge involves changes in networks of communication and relations with intra and inter-organization level. Our findings illustrate that organizations are capable of increasing their efficacy through network collaboration.

Managerial Implications

This study may have some significant applied implications. A major implication for business experts is the understanding of how inter-organizational learning and innovation drive the organization's performance. The growth of innovative product novelties calls for learning with partners in inter-organizational networks. This research paper shows that innovation mediates the link between the inter-organizational learning and performance; eventually, this affects the form and degree of relationship. Thus, inter-organizational learning strives to ensure the future business and its reproduction through the strength of the innovation may become to a key antecedent in enhancing inter-organizational network relationships. Consequently, the emphasis on innovations may have more performance attributes. They may involve different managerial expertise and skills.

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