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ON THE PATH TOWARDS OPEN INNOVATION: ASSESSING ROLE OF KNOWLEDGE ORIENTED LEADERSHIP WITH KNOWLEDGE CAPABILITIES

Arslan Najeeb Khan[1], Abeera Matloob[2] & Muhammad Shahid Tufail[3]

[1]Lyallpur Business School (LBS), Government College University, Faisalabad, Pakistan
[2]Lyallpur Business School (LBS), Government College University Faisalabad, Pakistan
[3]Professor, Department of Economics & Business Administration, University of Education, Lahore

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ABSTRACT

This paper aims to examine the outcomes of the knowledge-oriented leadership on the organization's open innovation through the mediating effect of the Knowledge Process Capability and Knowledge Infrastructure Capability and moderating role of Intellectual Capital. Data collection was done from the manufacturing sector through convenient sampling. The sample size was 105 respondents. The questionnaire was used and SEM is applied for the data analysis. The study concluded that there is a direct optimistic relation between KOL and OOI. Mediating role of KPC and KIC between KOL and OOI was found significant. Although the moderating results shows that by adding the intellectual capital as the moderator it increases the Organization's KPC and KIC and in return organizations will become capable for increasing its open innovation's targets. This study's finding can be helpful for employers in adopting better open innovation's trends with providing significant support for future investigation and research in related field.

Corresponding Author: Muhammad Shahid Tufail: mshahidtufail@gmail.com

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INTRODUCTION

In existing research, numerous studies appeared connection among IC and KM and its effect on yet, preceding studies ignored responsibilities preformed through KM infrastructure during sustaining and increasing KM processes and for accretion of IC (Ramadan, Dahiyat, Bontis, & Al-dalahmeh, 2017). Hence, the foremost purpose of conducting this study is to observe the link between KOL in organizations that was characterized in KM process (creation, distribution, appliance & storage of knowledge) and IC (structural capital, human capital & relational capital). Further it aims to explore part of the intellectual capital in relationship of KM capabilities and organization's open innovation. Knowledge Oriented Leadership is basic need of organizations

particularly which are dealing in technology orientation (Jasimuddin & Naqshbandi, 2018). That approach which is quickly creating and picking up reflection to progress process effectiveness, at side nonstop innovation. Knowledge leadership's need stems as of reality that knowledge practices inside innovation execution and access to the economical competitive advantage are for the trade victory. In this respect, companies that assign higher value to knowledge-oriented leadership are often more successful in the most competitive enviornment (Gürlek & Çemberci, 2020).

Open innovation has since popular topic in the research (Martinez, Acosta & Carayannis, 2017). Some Authors defined that improvement in the products, improvements in the marketing or sales methods; improvement in channel of the distribution is called innovation. The findings of previous researchers conclude that the innovation is like an engine that drives in both globally and locally. Innovation helps organizations to become more competitive and to change demands of market rapidly according to innovative activities. Intellectual capital could be foundation of originality and innovation and most important component for organization victory, particularly as it is inventor and mechanism for progress and accomplishment. Which require organization craving in getting competitive benefit to draw in mental assets and exertion to create and keep it up like this way which recognizes it from competitor to guarantee its survival and progression. Kashif, Siddiqui, Nawaz, Ghauri and Cheema (2011) recommended that intellectual capital is tied to innovation. This is often since intellectual capital is utilized to control and adjust all the human and nonhuman knowledge accessible in organizations so as to make esteem (Kong, 2010). The aim is to discover important aspects affecting knowledge-oriented leadership through the people's opinion that were directly occupied within decision making of any firm/business i.e., chief executive officer, director or manager. The study will also give insights in understanding how KOL style and KM capabilities i.e. (process & infrastructure) can impact open innovation targets.

Objectives of Study

The following objectives will indicate the major aspects of this study which are thus aimed to be achieved.

1. To find out influence of KOL on Organization's open Innovation among managerial level employees of manufacturing sector.
2. To analyze whether KM capabilities assist during improvement phase of organization's open Innovation activities.
3. To investigate function of IC in connection among KM Capabilities and organization's open Innovation.

LITERATURE REVIEW

This session of study focuses on the literature to put forward a research model which speculate that organization's open innovation facilitates knowledge-oriented leadership and knowledge capabilities. The section explored the main concept including definition and models and theory on the knowledge management, historical overview of the knowledge-oriented leadership, and theories relating to innovation and knowledge management to understand the main concepts comprehensively.

Defining Knowledge Management

In recent years, knowledge management emerges as important function of the companies to improve effectiveness (Abdi, Mardani, Senin, Tupenaite, Naimaviciene, Kanapeckiene & Kutut,

2018). Knowledge management is necessary for organization to achieve new results. As per K. and Petrovic (2012), knowledge management is term that means management of knowledge. It can be described as knowledge management for creating business value and creating viable advantages (Alzou'bi & Al-Zaidy, 2012). The knowledge management enables communication, creation and application of knowledge in all kind achieving the business or organizational main goals.

Knowledge Sharing

Knowledge sharing in an organization happens when their employees have openness in sharing explicit and tacit knowledge, which can maximize the competitive advantage of organization in the market (Hau, Kim, Lee & Kim, 2013). Tacit knowledge sharing has pessimistic association among innovation velocity and the financial performance of firm, while the explicit knowledge sharing has an optimistic association with the innovation & performance speed. The culture of an organization may impact knowledge sharing amid employees in organizations (Wang & Wang, 2012).

Knowledge Management & Knowledge Capabilities

In addressing KM capability & supply chain management practices (Inkinen, 2016) inspected KM in Saudi food industry by using the sample of 165 food companies in Saudi food industry. Study results explained that knowledge management assists organizations to get attain viable advantage by distribution of information among exterior partners and deliberating competitive product service and strategies of competitor and best practices. Besides, knowledge management help organization in interpreting, acquiring and using knowledge over resources form different practical restrictions for knowledge creation. Dahiyat (2015) examined knowledge management capabilities and organizational performance of 30 Iranian SMEs. The study outcomes explained that knowledge management capabilities including knowledge acquisition, knowledge sharing and the knowledge application have a considerable and significant optimistic effect on SMEs performance.

Knowledge Management Process

Abualoush, Masa'deh, Bataineh & Alrowwad (2018) examined the function of the KM process and IC in the organizational performance. The sample consisted of 134 employees from the Jordan's food industry. Therefore, the study outcomes elaborated that knowledge management infrastructure had optimistic impact on the KM process. Also, the findings concluded that the KM optimistically impacts IC and organization's performance and also mediation role in connection among the KM infrastructure and the intellectual capital. Ramadan et al. (2017) examined KM, intellectual capital and the social capital from the ICT segment in Jordon. The sample of the study consisted of 72 communication and information technology companies operating in Jordan collected through the survey questionnaire. The outcomes of the study explained that knowledge transfer and the knowledge documentation have strong impact on information and communication followed by knowledge creation and knowledge acquisition. Findings showed that active KM process make stronger organization learning at every level over promoting personal experience and HR in formulating new ideas in developing the new products.

Knowledge-Oriented Leadership

The knowledge-oriented leadership has been considered as crucial for the technology-oriented companies that create more value. The approach is developing rapidly and getting attention for

improvement in effectiveness of process through unremitting enhancement and innovation. Thus, the knowledge leadership derived from the knowledge practices relations to innovation performance and competitive advantage access which are considered an important act. Sadeghi and Rad (2018) studied effect of KOL on the innovation performance of the commercial and manufacturing companies in Guilan. In this connection, the information for study has been gathered from 282 people from the manufacturing and commercial companies. Study results found that KOL had an impact on the knowledge creation and application of the knowledge. Furthermore, the finding concluded that KOL directly affects the innovation performance of companies.

Open Innovation

Open innovation has been the most discussed topic in innovation management in past studies, with diverse results and approaches. Innovation performance is mixture of whole achievement of organization to improve and renovate the consequences of its effort and accomplishment of innovation in organization (Žemaitisa, 2014). Jasimuddin and Naqshbandi (2018) concentrate on the role of KM capability in KOL and open innovation in the France. The sample of study consisted of 172 international companies based in France. The outcome of the study concluded that there is optimistic impact of KOL in KM capabilities and OI of companies (Aloini, Dulmin, Farina, Mininno & Pellegrini, 2016). Furthermore, the findings the various studies concluded that knowledge management mediates the link between KOL and open innovation in different contexts.

Open Innovation and External Collaboration

The concept of open innovation is unending research subject which can be explored in both way internal and external viewpoints (Jimenéz, Costa & Valle, 2014). One of the important factors in understanding the notion of open innovation with great importance is collaboration of external resources and stakeholder or partners (Sanjay & Singh, 2019). This collaboration helps to contribute to a large extent in improving firm's potential to opt for innovation in the market. Both the invention and innovation emerged as successful in largely not only inside but outside the boundaries of organization (Aloini, Dulmin, Farina, Mininno & Pellegrini, 2016). KOL is attitude of an individual which promotes important and new knowledge to be share, create and utilize in the way that fetch outcomes and thinking in employees. Studied revealed role of KOL in KM and open innovation in Iran. Study outcomes explained that knowledge-based leadership and knowledge management have momentous connection with innovation performance.

Knowledge Management Role in Innovation

KM contributes a significant part in the progression and practices of organization in creating a positive atmosphere in the organization through promoting productivity and enriching work. It is considered as clear indicator and comprehensive method of restructuring the organization and helps them in developing the change to keep requirement of achieving operational and strategic goal of the organizations (Alzou'bi and Al-Zaidy, 2012). Many researchers studied the knowledge-oriented organizational role in culture and leadership effect on KM and innovation. The sample of the study consisted of 89 companies from the Mashhad science and technology park. The study results showed that managing knowledge has optimistic impact on innovation, with knowledge-oriented culture and leadership organization able to reach innovation higher level over innovation and managing knowledge. Gürlek and Çemberci (2020) investigated the

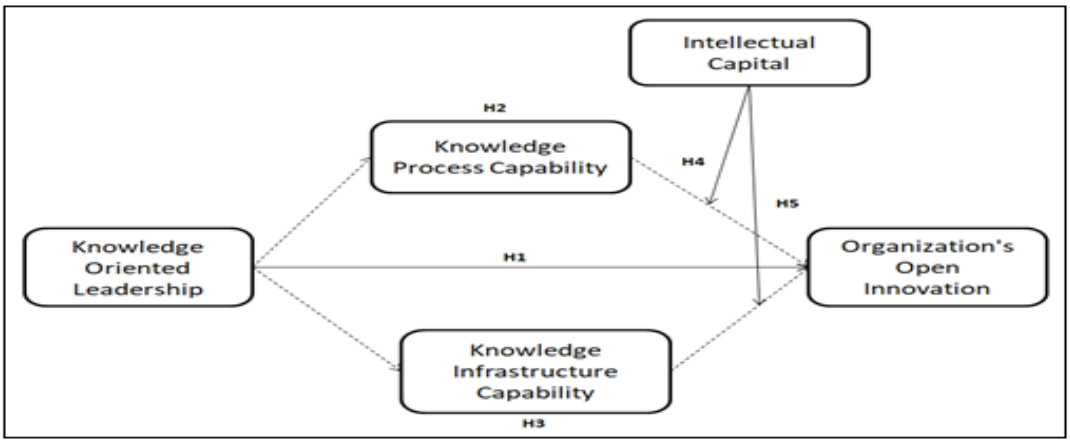
KM system for the open innovation and firm KM capacity. Statistics of study gathered from 298 Italian firms from varieties of sectors. The summary of study elaborated the interesting outcomes that knowledge management system help the firms in collaborative ecosystem and in this connection, creation of the open innovation through the development of the internal knowledge management capacity and process which increases the innovation activity in the organizations.

Research Framework

The following conceptual framework is developed for the current study from the existing research studies wherein particular theories are operative behind this framework in order to conduct the study:

Figure 1

Theoretical Framework



Hypotheses of Study

Keeping in view the literature reviewed below subsequent hypothesis was proposed based on literature:

H1: There is a positively significant relationship amid knowledge oriented leadership and OOI.
H2: KPC mediates the association among knowledge oriented leadership & Organization OI.
H3: KIC mediates the connection between knowledge oriented leadership and organization OI.
H4: IC moderates the affiliation between knowledge process capability and organization's OI.
H5: IC moderates the liaison between the knowledge process capability and organization's OI.

METHODOLOGY

The study used the different methods and procedures for conducting study. The data collection was done during months from March to July, 2019. The data used in this research study is of primary nature. A cross sectional design was adopted. The questionnaires along with covering letter clarifying objective of this research were disseminated. Convenience sampling technique is used in this study. According to employee accessibility, a proposed convenience sample was

200 out of which usable sample of 105 completed questionnaires were return with response rate of 53%.

Measures

Smart PLS 3 (SEM) is utilized in this study for checking connection among variables. While for measuring the variables 5 - point likert scale ranging from "1" for "strongly disagree" to "5" for "strongly agree" were take on. Questionnaire consists of 57 items chosen from prior pragmatic research to determine the model constructs. In this connection, slight alterations were made for adjusting them according to setting of this research in order to meet desired objective more systematically.

Knowledge Oriented Leadership

KOL was evaluated by using scale developed by Donate and Pablo (2015). The scale consists of 6-items. Questionnaire show acceptable internal consistency (α=0 .801) and (composite reliability = 0.853).

Knowledge Process Capability

Knowledge Process Capability of the surveyed firms was measured using 16 items take up from study of Lin and Lee (2005). Composite reliability is 0.933 and acceptable internal consistency (α=0.921).

Knowledge Infrastructure Capability

To measure knowledge infrastructure capability, we used 18 items take up from influential work of Gold and Malhotra (2001). Composite reliability is 0.946, acceptable internal consistency (α=0.937).

Organization's Open Innovation

Organization's OI is measured by 07 items, which were taken from the preceding studies of (Jasimuddin & Naqshbandi, 2018). CR of measures is 0.913 and acceptable internal consistency (α=0.883).

Intellectual Capital

To measure Intellectual Capital, we used 10 items adapted from the studies of Abed Al-Qader (2014) and Hsu & Sabherwal (2011). Thus, measures show the acceptable internal consistency (α=0.819).

RESULTS AND DISCUSSIONS

To conduct study, data were gathered from the employees of different organizational sectors who does involve in the decision making of firm like the Chief Executive Officer, Directors and Managers. More over items of questionnaires were analyzed through Smart PLS 3.0 version and data inputting was in SPSS 23 version, because this software supported model construct of this study. The main results have been offered in this section that have been validated through the results of the existing research studies in order to provide the clear picture of this study in existing databse of the knowledge regarding the issues under considerations in this resesrch study.

Table 1
Descriptive Statistics

Variables	N	Mini	Max	Mean	Std. Deviation
Knowledge Oriented Leadership	105	1.67	4.67	3.9571	.53859
Knowledge Process Capability	105	2.75	4.88	3.8423	.48203
Knowledge Infrastructure	105	2.33	4.94	3.9725	.50491
Organization's Open Innovation	105	2.71	5.00	3.9864	.47070
Intellectual Capital	105	2.50	5.00	4.2429	.43098

The descriptive statistics provides significant information in describing research variables where knowledge oriented leadership (KOL) has the mean value of 3.96 and standard deviation of 0.54, knowledge process capability (KPC) (intervening variable) has mean value of 3.84 and standard deviation of 0.48, knowledge infrastructure capability (KIC) (intervening variable) has Mean Value of 3.97 and standard deviation of 0.50, organization's open innovation (OI) has Mean Value of 3.99 and standard deviation of 0.47 and intellectual capital (IC), potential moderator, has Mean Value of 4.24 and standard deviation of 0.43. In above table N shows the total number of respondents those who participated in this study which is 105 and minimum values of all variables (KOL, KPC, KIC, OI and IC) is 1.67, 2.75, 2.33, 2.71 and 2.50 respectively while maximum values of all variables (KOL, KPC, KIC, OI & IC) is 4.67, 4.88, 4.94, 5.00 and 5.00 respectively.

Table 2
Correlation Analysis

Variables		KOL	KPC	KIC	OI	IC
KOL	Pearson Correlation	1	.265**	.219*	.402**	.266**
	Sig. (2-tailed)		.000	.025	.000	.000
	N		105	105	105	105
KPC	Pearson Correlation		1	.689**	.630**	.415**
	Sig. (2-tailed)			.000	.000	.000
	N			105	105	105
KIC	Pearson Correlation			1	.599**	.531**
	Sig. (2-tailed)				.000	.000
	N				105	105
OI	Pearson Correlation				1	.448**
	Sig. (2-tailed)					.000
	N					105
IC	Pearson Correlation					1
	Sig. (2-tailed)					
	N					

KOL and KPC are positively correlated with value of r = 0.265, n = 105 and p = 0.000 which is significant at 0.01 levels which indicates that increase in KOL will also cause smallest increase in KPC. KOL and KIC are positively correlated with value of r = 0.219, n = 105 and p = 0.000 which is significant at 0.05 levels which indicates that increase in KOL will also cause smallest increase in KIC. KOL and OOI are positively correlated with value of r = 0.402, n = 105 and p = 0.000 which is weakly significant at 0.01 levels which indicates that increase in KOL will

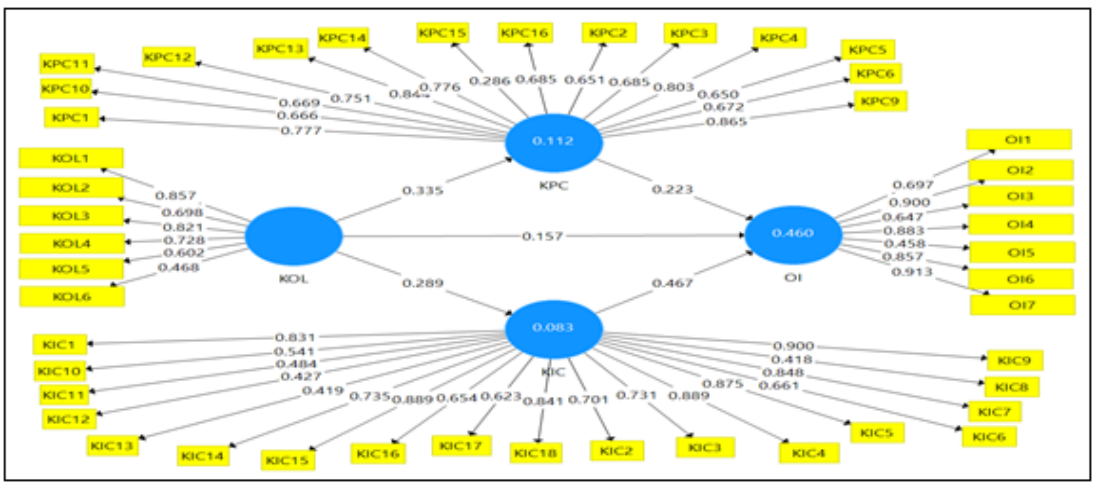
cause smaller increase in OOI. KOL and IC are positively correlated with value of r = 0.266, n = 105 and p = 0.000 which is significant at 0.01 levels, indicates that increase in (moderator) IC will also cause increase in KOL. The strongest correlation is between KPC and KIC: r = 0.689 which illustrate a strong, optimistic association between KPC & KIC. An increase in KPC is correlated with the increases in KIC. OOI is positively correlated with the mediating variable KPC having value of 0.630 covering significant level at 0.01. IC (Predictor Variable) is positively correlated with KPC, KIC and OOI having value of 0.415, 0.531 and 0.448. Overall, the results show that the independent variable has optimistic affiliation with the dependent variable.

Table 3
Reliability Analysis

Variables	No. of	Cronbach's	Composite	Average
Knowledge Oriented	6	0.801	0.853	0.501
Knowledge Process Capability	16	0.921	0.933	0.506
Knowledge Infrastructure	18	0.937	0.946	0.508
Organization's Open Innovation	7	0.883	0.913	0.610
Intellectual Capital	10	0.819		

For acceptance of the reliability of variable the value should be more than 0.7, which explains that KOL, OOI and IC having thr good reliability and consistency as Cronbach's alpha of these three variables has value 0.801, 0.883 and 0.819 respectively while remaining two intervening variables has highly reliable with value of 0.921 and 0.937. Hence, all variables are significant appearing that model is reliable. The benchmark value for Composite Reliability is 0.7 and variables used in this study ranges from 0.853 to 0.946, which are considered as Good value as per meeting of criteria. Benchmark value for AVE is 0.5. In above table values ranges from 0.51 to 0.61 which are accepted.

Figure 2
Path Estimates Direct Effect



The above model demonstrates direct optimistic (0.157) path estimate from the KOL to OOI. Then showed indirect optimistic (0.335) and (0.223) path estimate from KOL to KPC & OOI. Also, results from above table showed an indirect optimistic (0.289) and (0.467) path estimate from KOL to KIC & OOI respectively from results. All above stated variable shows' significant effects.

Table 4
Direct Effects

Variables	(O)	(M)	(STDEV)	(|O/STDEV|)	P-Values
KIC -> OOI	0.467	0.472	0.086	5.442	0.000
KOL -> KIC	0.289	0.315	0.121	2.379	0.018
KOL -> KPC	0.335	0.373	0.085	3.943	0.000
KOL -> OOI	0.157	0.145	0.085	1.844	0.056
KPC -> OOI	0.223	0.236	0.085	2.613	0.009

**p < 0.01 *p < 0.05 *p < .10

The above table shows that relationship of KIC & OOI is the extremely significant having mean value of 0.472. The standard error value of the bootstrapping is 0.086. Then demonstrated the association between KOL & KIC is considerable by the mean value of 0.315 & value of standard error is 0.121. After that enlighten the affiliation between KOL & KPC is significant with the mean value of 0.373 & value of standard error is 0.085. Further, explain connection between KOL & OOI is significant through mean value of 0.145. Lastly, illustrate the link between KPC & OOI is significant through the mean value of 0.236 and value of standard error is 0.085. It is shown in above table that P value is significant having 0.000, 0.018, 0.000, 0.056 and 0.009 respectively.

Table 5
Indirect Effect

Variables	(O)	(M)	(STDEV)	(O/STDEV)	P-Values
KOL -> KIC -> OOI	0.135	0.150	0.069	1.964	0.050
KOL -> KPC -> OOI	0.075	0.089	0.042	1.766	0.078

***p < .01 **p < .05 **p < .10

The over table demonstrates that the first mediating association among KOL, KIC and OOI is significant having the P Value 0.050 which is less than 0.05. Similarly, the second mediating relationship between KOL, KPC and OOI is significant having P Value 0.078 which is less than 0.10.

Table 6
Model Summary

R	R-sq	MSE	F	df1	df2	p
0.538	0.2895	0.1621	13.7164	3.00000	101.0000	0.0000

Model						
Variables	Coeff.	se	t	P	LLCI	ULCI
Constant	2.8049	2.8172	0.9956	0.3218	-2.7837	8.3936
KOL	-0.1583	0.7542	-0.2098	0.8342	-1.6545	1.3379
IC	0.0363	0.6523	0.0557	0.9557	-1.2576	1.3303
Int_1	0.0981	0.1735	0.5655	0.5730	-0.2461	0.4424

Overall, moderation effects show that by adding intellectual capital as moderator it increases organization KPC & KIC and in return organization be capable to increases it open innovation targets.

Hypothesis Testing

Table 7
Hypothesis Supporting Results

Hypothesis	Path	Results
H1	KOL -> OOI	Supported
H2	KOL -> KPC -> OOI	Supported
H3	KOL -> KIC -> OOI	Supported
H4	IC -> KPC -> OOI	Supported
H5	IC -> KIC -> OOI	Supported

Earlier than checking hypotheses, model fit from the structural model was assessed. According to the strategy of Hair et al. (2010), adequate model fit was acquired; Chi-square=13473.14; df1=3.00000; df2=101.0000; Ratio=0.538; RMSEA=0.1621. Subsequently we tested the direct relationships. H1 that forecasted significant association of KOL with OOI, were supported that hypothesizes that KOL has direct positive effect on OOI by the value of path estimate 0.157 ($p < 0.056$) with T-Value of 1.844. H2 were also accepted that posits the mediating effect of KPC has positive significant relation with KOL and OOI by the value of indirect path estimate 0.335 and 0.223 ($p < 0.000$ and 0.009) with T-Value of 3.943 and 2.613 respectively. H3 posits that KIC mediates the relationship between KOL and OOI and accepted due to meeting significant criteria with path estimate value 0.289 and 0.467 ($p < 0.000$ and 0.018) with T-Value of 5,442 and 2.379 respectively. Consequently, H4 which shows moderation among IC, KPC and OOI were also accepted and lastly, H5 which shows moderating effect in between IC, KIC and OOI were supported means by adding IC relationship among KIC and OOI is expected to be increases positively.

CONCLUSION

This study encompasses positive significant impact of KOL on knowledge capability and open innovation of firms. The findings from previous literature show that knowledge management has aligned with organizational culture and vision to impact positively on the firm innovation capacity. The literature finding shed light on the following point. Firm performance has a positive relationship with open innovation in boundaries with other firms. Through effective management, firm performance has positive relationship with open innovation in boundaries with other firms. Knowledge management help firm in creation of open innovation through

knowledge management capacity which increases innovation activity. The objective to conduct this reading is to discover linkages of KOL with organizational open innovation by mediating effects of KM capabilities. Researchers around globe take many dimensions of above-mentioned variables. But we have taken new model construct in developing economy like Pakistan. With based on previous literature and past contribution we made, clarifies results of variables used in study.

Furthermore, overall findings from results show significant relation of KOL and organization's OI and path estimates of our results proved that mediating effect of KPC has positive significant relation with KOL and organization OI. In this way knowledge infrastructure capability mediates relationship between knowledge-oriented leadership and organization open innovation and accepted due to meeting significant criteria with path estimate values. Lastly, moderation effects show that by adding intellectual capital as moderator it increases organization's KPC & KIC, which results in increasing the organization's open innovation. By this study we came to know that dimensions of intervening variable KM capabilities i.e., process and infrastructure are very much important for innovation targets of any firm. Also, found that dependent variable KOL has very important role in increasing organization's open innovation. Study revealed that in manufacturing sector organization open innovation plays vital role that decide how employees will perform and how KM abilities can be formed and to which direction will it take innovation outcomes.

Future Research

It is proposed for future studies to include turnover of worker as figure to examine qualitative study in view of fact that knowledge misfortune can happen lacking leadership affiliation when an organization's workers leave (Musa & Ismail, 2011). The advancement of organization's volume, like in Wang and Wang's (2012) study, would in addition advantage upcoming studies because it incorporates disputes of investigating information sharing as well as a KM's overall structure. I didn't have much time for conducting a longitudinal study that would have include more required profundity to data collected, that's why another proposed choice be to conduct a study based on qualitative longitudinal design. Carrying out qualitative longitudinal study through extension of chronicled information, like money related or record's preparing, would include abundance to matter giving establishment or standardized data. In case you need to linger by quantitative study, considering knowledge manager and innovation pioneers would give additional precision for reactions because the people would be extra particular to subject in inquiry. Since this study as it were inspected the managerial viewpoint based on Pakistani companies, it maybe great to accumulate samples from lower, middle/top line representatives from other states. For effective results there must be large sample to analyze and conclude the research.

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