



Journal of Management and Research (JMR)

Volume 8 Issue 1, 2021

ISSN_(P): 2218-2705 ISSN_(E): 2519-7924

Journal DOI: <https://doi.org/10.29145/jmr>

Issue DOI: <https://doi.org/10.29145/jmr/81>

Homepage: <https://ojs.umt.edu.pk/index.php/jmr>

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Pub. Online: 2021

Article DOI: <https://doi.org/10.29145/jmr/81/080104>

Article History: Received: Oct-2020
1st Revised: April-2021
2nd Revised: May-2021
Accepted: May-2021

To cite this article: Siddique, A., Nazir, A., Adnan, S., & Duryab, M. A. (2021). Role of human capital in market orientation–innovation relationship. *Journal of Management and Research*, 8(1), 69–98.
[Crossref](#)

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A publication of the
School of Business and Economic
University of Management and Technology, Lahore, Pakistan

Role of Human Capital in the Market Orientation – Innovation Relationship

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Abstract

Academics and practitioners have regarded innovation as a source to gain sustainable competitive advantage (SCA) over rival firms. Although market orientation (MO) and human capital (HC) were found to impact a firm's ability to innovate independently of each other, yet how they interact with each other has not been studied earlier. Drawing from the theory of organizational learning, this study proposes that human capital (HC) mediates the relationship between MO and innovation. The proposed relationship was empirically tested using the data collected from managers working in the textile sector of Pakistan. The results revealed that HC and MO independently affect innovation, while HC partially mediates the relationship between MO and innovation. Practical and future research implications of the current study are also discussed.

Keywords: administrative innovation, competitive advantage, human capital, learning, market orientation, mediation

Introduction

Many factors drive innovation in firms, however, market orientation (MO) and human capital (HC) are among the most important factors that affect a firm's ability to innovate (Aydin, [2020](#); Knezović et al., [2020](#)). Their impact on innovation has been studied individually by many scholars (Alhakimi & Mahmoud, [2020](#); Sun et al., [2020](#)). However, no significant research has been conducted to study how MO and HC relate with each other and also with innovation when taken together. Based on the argument of Slater and Narver ([1995](#)), this study posits that market-oriented organizations learn from their environment which enables them to develop their HC by gaining new knowledge, skills and abilities required to innovate. This indicates that HC might intervene in the relationship between MO and innovation. Furthermore, most of the researchers investigated the technical aspect of innovation even though most innovations occurring in the firms are administrative in nature (Ganter & Hecker, [2014](#)).

HC and MO are among those intangible resources and capabilities that affect a firm's ability to innovate and to gain competitive advantage over rival firms

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(Jogarathnam, [2018](#); Ozkaya et al., [2015](#)). MO of a firm helps it to generate market and customer related information which allows it to respond to its market effectively (Kohli & Jaworski, [1990](#)). It also enhances its ability to innovate and produce innovative goods and services as well as challenge the old-held assumptions and principles of its market (Kohli & Jaworski, [1990](#)). Hence, the imminent effect of MO is the triggering of innovation as it responds to market information by introducing new products (Aydin, [2020](#)).

Similarly, HC also affects innovation. HC, defined as a set of knowledge, skills, and abilities (KSAs), is an organizational resource related to individuals and resides in employees. HC is a significant source of gaining competitive advantage over other firms as it can induce innovation (Pradana et al., [2020](#)). Past research has also revealed that HC has a positive relationship with innovation and it helps to reduce the barriers to innovation in the firms (D'Este et al., [2014](#)). Similarly, it was found to induce innovation in established firms (Sun et al., [2020](#)), small and medium-sized enterprises (Handayani, [2020](#)), start-ups (Setiawan et al., [2020](#)), and even across different countries (van Uden et al., [2017](#)). Therefore, it can be inferred that HC improves a firm's ability to gain competitive advantage by increasing its ability to innovate.

Thus, MO and HC are the factors that foster innovation in organizations and enable them to enhance their performance and gain competitive advantage. Further, Wei and Lau ([2005](#)) argued that MO helps firms to build intangible resources such as HC. Research has shown that MO is related to organizational learning, since one of the many ways organizations learn is based on the information generated through MO (Slater & Narver, [1995](#)). Firms transform this information into organizational knowledge with the help of organizational learning (Kasim et al., [2018](#)). However, an organization does not learn by itself; instead, it learns through its workers who act as learning agents in the organization (Argyris & Schoen, [1978](#)). Therefore, it is argued that HC might intervene in the relationship between MO and innovation.

No research has studied the role of HC in the MO – innovation relationship to support the above viewpoint. Further, recent extensions of the resource-based view RBV of the firm state that gaining sustainable competitive advantage is difficult by employing and relying only on one resource. Instead, firms should use different resources and competencies to gain sustainable competitive advantage (Ruiz-Moreno et al., [2016](#)). Hence, analyzing how these resources, that is, MO and HC interact with each other in their relationship with innovation is the aim of this study.

Further, past studies on innovation concentrated on the technical aspect of innovation (product and process innovation) (Damanpour & Aravind, [2012](#); Ganter

& Hecker, [2014](#)). Nevertheless, Ganter and Hecker ([2014](#)) argued that innovativeness is not limited to product or process innovation only; instead, the majority of innovations in organizations are administrative in nature. Conversely, researchers have given little attention to administrative innovation in innovation research (Ganter & Hecker, [2014](#)). Hence, the administrative aspect of innovation is the focus of the current study to make for the deficiency in administrative innovation literature.

The current paper is structured in the following way. Section 2 reviews the literature related to the constructs of the study and proposes certain hypotheses based on it. Section 3 outlines the methodology used to test the hypotheses. Section 4 presents the results of the study followed by a discussion and the practical implications of the study outlined in Section 5. Section 6 concludes the study.

Literature Review

Innovation is considered as one of the critical resources to gain competitive advantage over other firms owing to its context-specific characteristics (Ganter & Hecker, [2014](#); Udriyah et al., [2019](#)). Resource-based view RBV, of the firm the underlying framework of this study, helps to analyze innovation and its impact on organizational performance (Aydin, [2020](#)). According to RBV, only those organizational resources which are valuable, rare, inimitable, and non-substitutable help an organization to gain and sustain competitive advantage over other firms (Barney, [1991](#)). It argues that firm resources influence the positive effect of innovation on firm performance as they help the respective firm to exploit innovation (Damanpour et al., [2009](#)). Previous research showed that innovation positively affects firm performance (Prifti & Alimehmeti, [2017](#)). Hence, innovation is critical in gaining competitive advantage.

Since innovation is essential for organizational performance and gaining competitive advantage, so identifying the mechanisms that stimulate it is necessary to study the relationship between innovation and other organizational variables, holistically (Keskin, [2006](#)). Previous research revealed that the direct effect of MO on innovations taking place in a firm is significant. This effect of MO on innovation has been noted by different scholars working in different industries and countries. In a research conducted on manufacturing firms in Turkey, Aydin ([2020](#)) found that customer orientation and inter-functional coordination (sub-dimensions of MO) positively affect product innovation. Ho et al. ([2018](#)) revealed similar findings for the agriculture sector. They found that MO does not directly affect financial performance. Conversely, customer orientation and inter-functional coordination affect innovation which, in turn, affects financial performance. This suggests that

MO indirectly improves the financial performance of firms by enhancing their innovativeness. Similarly, Alhakimi and Mahmoud (2020) found that customer and supplier orientation significantly affect the innovativeness of SMEs. However, the other two dimensions, that is, competitor orientation and inter-functional coordination were found to be insignificant. Alhakimi and Mahmoud (2020) concluded that the innovativeness of SMEs increases with an increase in their MO.

Setiawan et al. (2020) argued that a firm's degree of MO predicts its capacity to innovate. Their findings based on the business start-up coffee shops in Indonesia supported their claim. They found that start-ups with a high degree of MO have a better capacity to innovate. Prifti and Alimehmeti (2017) also supported this assertion. Based on the evidence from Albania, they found that the firms that generate information from their customers and competitors learn from it and implement it by responding to customer needs and become more innovative. Drawing conclusion from 122 Asian emerging market firms, Chung (2019) revealed that intelligence generation and responsiveness positively and significantly affected innovation. He argued that although information dissemination has no direct impact on innovativeness, its strategic positioning with business and political ties positively impacts innovation.

Oswald and Brettel (2017) argued that MO leads to incremental innovation and also enables firms to innovate radically. Collecting data from five different countries with different cultural contexts, Oswald and Brettel (2017) found that responsive MO leads to incremental innovation, whereas proactive MO leads to radical innovation in the firms. They found no significant differences among the surveyed countries. Similarly, it was shown that the effect of MO is not limited to technical innovations. Investigating the association between MO, marketing capabilities, and sustainable innovativeness among service firms in India, Kamboj and Rahman (2017) found that firms with MO develop marketing capabilities leading to technical and non-technical or administrative innovations. Hence, this study proposes the following hypothesis:

H1: Market orientation (MO) has a positive effect on a firm's administrative innovation.

Similar to MO, HC was also found to affect organizational innovation. For example, Costa et al. (2015) found that HC significantly and positively affects the product innovation performance of innovative SMEs. Pradana et al. (2020) found that a firm's valuable and rare HC helps transform absorptive knowledge into innovation, ultimately leading to competitive advantage. Drawing from a sample of manufacturing companies operating in China, Sun et al. (2020) found that firms

with more highly educated workers succeeded in getting higher patents. Similarly, the level of education significantly affected patenting in the firms operating in mid-sized cities. Examining manufacturing and service firms in Nigeria, Jibir and Abdu (2020) also found that the number of skilled staff and top management's postgraduate education was significantly related to innovation.

Bonesso et al. (2020) found that intangible HC in the form of behavioral competencies affected innovation diversification among the Italian high-fashion footwear industry. They found that managers who exhibited a higher degree of intangible HC in the form of emotional, social, and cognitive competencies achieved a higher degree of innovation diversification. Their results revealed that cognitive competencies and the support of emotional and social competencies lead to product innovation. Similarly, social competencies lead to process innovation, whereas non-technical innovations (administrative and marketing innovations) require a more interactive and multifaceted use of all behavioral competencies. Thus, they found theoretical and empirical support for their claim that intangible HC helps drive the innovation process.

The relationship between HC and innovation was also found to exist across various countries. Studying more than twenty thousand organizations in Germany and Netherlands, Bartelsman et al. (2015) reported a positive association between HC and innovation in both countries. Hence, based on previous findings, the following relationship is proposed:

H2: Human capital (HC) has a positive effect on the firm's administrative innovation.

Though MO and HC are known to affect innovation, the association between them regarding innovation is not clear. MO considers information generation, sharing, and involvement of different departments in the process of innovation as crucial. Similarly, organizations with low HC may face difficulty in internalizing outside information and converting it into organizational knowledge required for innovation (Costa et al., 2015). Hence, it may be difficult for organizations to internalize and benefit from the knowledge generated through MO without HC.

Although there is no literature available on the direct relationship between MO and HC, this study argues that MO and HC are related to each other via organizational learning. Market-oriented firms develop their HC to successfully function as learning organizations. A market-oriented firm generates information from outside the organization (from customers and competitors), disseminates it within the organization, and responds to it according to the customers' needs.

Transforming the information generated from the market into knowledge requires the process of learning. Therefore, MO provides the organization with information about its market and helps it to develop its learning ability (Raj & Srivastava, [2016](#)). Consistent with this argument, Raj and Srivastava ([2016](#)) found empirical evidence that MO leads to organizational learning within the organization.

All organizations learn either actively or passively, intentionally or unintentionally. They do not learn independently but through their employees. Although organizations are not dependent on any specific employee for learning, they are not independent of all of their employees collectively (Kim, [1998](#)). Kim ([1998](#)) describes that learning has two meanings. Firstly, it is the gaining of skill or know-how which implies the ability to generate an action. Secondly, it comprises the gaining of know-why which implies the ability to express the theoretical understanding of an experience. Thus, in a nutshell, learning includes gaining skills and abilities, as well as the knowledge required for using them effectively. Hence, when organizational learning takes place in a firm it creates new knowledge, skills, and abilities that improve or develop the HC, an integral part of the intellectual capital of the firm (Bhattacharya & Bloch, [2004](#)). The empirical findings of Hsu ([2007](#)) support the claim that organizations that encourage organizational learning develop more of their HC.

An essential facet of organizational learning is the sharing of knowledge. Without knowledge sharing, an organization cannot learn. An organization learns only when its employees willingly share their knowledge with other organizational members (Meher & Mishra, [2021](#)). Therefore, learning organizations create a knowledge-sharing culture that encourages their employees to share their knowledge with others, thus generating new knowledge through transfer and exchange. This leads to the development of human capital (KSAs), which improves the performance of the employees and firms by allowing them to utilize newly generated knowledge. Empirical evidence by Tidd ([2001](#)) also confirms this association.

For organizational learning to take place in a firm, it requires a culture that supports and encourages learning. MO provides that necessary culture for organizational learning to foster in an organization (Slater & Narver, [1995](#)). Slater and Narver ([1995](#)) stated that MO is essentially a learning orientation. It has an outside focus on acquiring and disseminating information regarding customers and competitors, giving it an advantage over others in responding to the market needs in the form of better products and services. An organization generates and shares information regarding outside factors such as customer need, market,

organizational processes, and changing technology, affecting its performance. The employees of such an organization quickly solve problems by communicating, coordinating, and even challenging the organization’s basic assumptions to reach a shared meaning of the relevant information, enabling them to respond to the changing markets (Slater & Narver, 1995). This creates a culture of learning in the respective organization, encouraging the employees to generate new knowledge and develop their personal and organizational HC. Thus, the level of MO of a firm affects its level of HC.

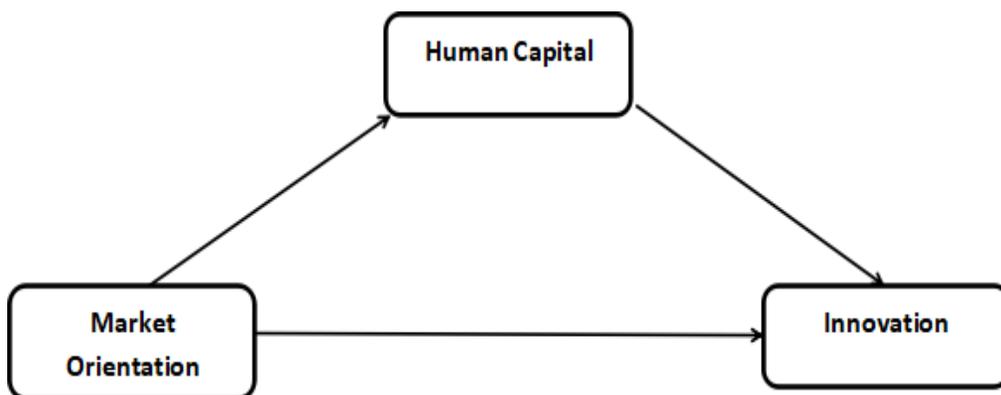
Since organizational innovation requires producing new knowledge or merging the existing knowledge in new ways, it is primarily associated with HC and organizational learning. The latter is the mechanism through which firms transform their employees’ knowledge into organizational knowledge (Jiménez-Jiménez & Cegarra-Navarro, 2007). Furthermore, intellectual capital is the stock of knowledge that is of no use to the organization if it is not leveraged and continuously upgraded. Hence, this stock of knowledge is continuously updated by MO through organizational learning (Jiménez-Jiménez & Cegarra-Navarro, 2007). MO develops HC in the firm by encouraging employees to learn and generate knowledge. Therefore, the current study hypothesizes the following relationship:

H3: Human capital (HC) mediates the relationship between market orientation (MO) and innovation.

Based on the relationships proposed above, this study proposes the following theoretical framework:

Figure 1

Theoretical Framework



Methodology

Target Population and Data Collection

The population comprised 772 manufacturing and processing textile mills of Pakistan registered with APTMA (All Pakistan Textile Mills Association) and APTPMA (All Pakistan Textile Processing Mills Association). APTMA is the largest association of textile manufacturing firms representing spinning, weaving, and composite mills with 396 members, whereas APTPMA is the association of textile processing firms having 376 members. A list of APTMA and APTPMA members served as the sampling frame of the current study. Data was collected from managers and senior managers in the organizations. Managers get information from different sources and are usually aware of various decisions being taken and implemented (Ahmed et al., 2018). Therefore, they served as the key respondents.

Since the study population was geographically widespread, the researchers could not collect data personally due to time and resource constraints. Hence, the researchers identified the initial contact information of 732 textile mills from the sampling frame. An electronic version of the survey questionnaire and a cover letter were sent to each identified contact for data collection. The cover letter clearly stated the details about the nature and objectives of the study and ensured anonymity. Follow-up emails were sent after two weeks to get the maximum response from the respondents. Some respondents were contacted personally, where possible, to ensure the maximum response rate. Although this is a firm-level study, only one response from each firm was received. As mentioned above, the respondents from each firm were employees who had the designation of manager, minimally. The researchers received 133 usable responses with an approximately 18% response rate.

Survey Instrument

Since this research employs the survey questionnaire method, therefore, a survey instrument was used. The measure for administrative innovation was adopted from Vaccaro et al. (2012), which consists of six items measuring three dimensions including management practices, processes, and structures. Each dimension is measured using two different items. Different researchers have used this scale and found it reliable (Chang, 2016; Zhang et al., 2019). Sample items include “*Rules and procedures within our organization are regularly renewed.*” HC was measured using a nine-item instrument developed by Bontis and Fitz-Enz (2002). Sample items include “*Our organization consistently comes up with great new ideas*” and “*Our employees are widely considered as the best in the whole*

industry.” The instruments for HC and administrative innovation were adopted and were both measured using a seven-point Likert scale ranging from “1 = strongly disagree” to “7 = strongly agree”.

MO was measured using a 22-item MARKOR scale developed by (Kohli et al., 1993). MO is most widely measured using MARKOR by Kohli et al. (1993) and MKTOR by Narver and Slater (1990). Both the scales use different perspectives to measure MO. MARKOR uses the behavioral perspective, while MKTOR uses the cultural perspective to measure MO. However, according to González-Benito and González-Benito (2005), most researchers prefer to use the activity approach as compared to the cultural approach for two reasons. Firstly, the activity approach (which measures the operational characteristics of MO) is more popular and generally accepted by researchers as opposed to the cultural approach. Secondly, they argued that the measures developed by the cultural approach scholars also focus on the operational characteristics of MO. Their results showed a stronger positive relationship for MARKOR as opposed to MKTOR. Furthermore, the content analysis of MARKOR and MKTOR conducted by Gauzente (1999) also revealed that the former is completely consistent with its definition. In contrast, the latter was found to be partly inconsistent with its conceptualization. Hence, for these reasons, MARKOR was preferred in this study over MKTOR. As discussed above, this scale comprises three sub-constructs consisting of intelligence generation (eight items), intelligence dissemination (six items), and responsiveness (eight items). The items are scored on a 5-point Likert scale ranging from “1 = strongly disagree” to “5 = strongly agree”. Survey instrument is given in *Appendix A*.

Pilot Testing

The survey instrument was pilot tested before collecting data to ensure that the respondents fully understood and responded to the terms and items of the survey instrument. Data for pilot testing was collected from the managers of textile mills registered in the Lahore Chamber of Commerce and Industry (LCCI), although they were not members of APTMA or APTPMA. The pilot test results about the internal consistency and validity of the instrument are given below in Table 1.

Table 1*Results of Pilot Testing (N=16)*

Construct	Cronbach's alpha	No. of items
Innovation	.800	6
Human Capital	.893	9
Information Generation	.771	8
Information Dissemination	.773	6
Responsiveness	.751	8

The above results show that the Cronbach's alpha values for innovation, HC, and MO constructs, that is, information generation, information dissemination, and responsiveness, are well above the acceptable range. Further, there are no missing values for all the constructs suggesting that the measures are reliable and valid. MO instrument was used by several scholars in their studies and was consistently found to be reliable. In conclusion, the pre-test findings revealed that the instrument is reliable and valid for data collection.

Data Analysis and Results

Demographic Profile

Table 2 contains the demographic details of the respondents. Of the 133 respondents 129 were male, indicating that men comprised the vast majority of the respondents. It implies that the data collected is skewed with respect to gender. Hence, all the results should be viewed in this gendered context. Almost half (48.9%) of the respondents had the designation of manager, whereas 31.6% were senior managers in their respective firms. Further, nearly half (51.1%) of the respondents had five or less than five years of experience, whereas 48.9% had more than five years of experience in their particular organization. Moreover, 32.3% had more than ten years of experience in their current organization. These statistics reflect that the respondents had a variety of job experience.

Statistics related to the firm's age revealed that 48% of the selected organizations are more than 20 years old. On the contrary, relatively new organizations that are less than 5 years old make 19.5% of the total data. Overall, one-third (33.8%) organizations are less than 10 years old, whereas two-third are more than 10 years old. The number of employees in an organization is often used to differentiate among small and big organizations. Statistics revealed that 43.6% of the respondents worked in small organizations with less than 50 employees, whereas 31.6% were from relatively big firms with more than 500 employees.

Overall, 56.4% respondents were from small firms with less than 100 employees, whereas 43.4% of respondents were from large firms having more than 100 employees. Table 2 summarizes the demographic statistics.

Table 2

Demographic Profile

Variable	Items	Frequency	Percentage
Gender	Male	129	97.0
	Female	4	3.0
Designation	Manager	65	48.9
	Senior Manager	42	31.6
	General Manager	19	14.3
	CEOs	7	5.2
Experience in this organization	Less than 2 years	22	16.5
	2-5 years	46	34.6
	6-10 years	22	16.5
	more than 10 years	43	32.3
Age of business unit	Less than 5 years	26	19.5
	5-10 years	19	14.3
	11-20 years	24	18.0
No. of employees	more than 20 years	64	48.1
	50	58	43.6
	50-100	17	12.8
	101-500	16	12.0
	more than 500	42	31.6

Measurement Model

The measurement model assesses and establishes the reliability and validity of the instrument. In this regard, items with factor loadings less than the cutoff value of 0.5 (Hair et al., [2010](#)) were removed. Even though researchers recommend factor loading of 0.7 or higher (Vinzi et al., [2010](#)), loadings greater than 0.5 are considered acceptable in social science research (Latif et al., [2020](#)). Instead of removing items with low factor loadings, their effect on composite reliability (CR) and convergent validity measured by the average variance extracted (AVE) is observed. Items are removed if it results in CR and AVE values higher than the acceptable range. However, it is advised not to remove the items if CR and AVE values are already higher than the cutoff point. Therefore, only three MO items (IG8, Resp2, and Resp8) with loadings less than the acceptable value were removed.

Table 3*Factor Loadings, Reliability, and Validity*

	Loadings	Alpha	CR	AVE
Market Orientation		0.954	0.958	0.549
IG_1	0.772			
IG_2	0.754			
IG_3	0.724			
IG_4	0.783			
IG_5	0.710			
IG_6	0.682			
IG_7	0.728			
ID_1	0.794			
ID_2	0.721			
ID_3	0.798			
ID_4	0.822			
ID_5	0.781			
ID_6	0.851			
Resp_1	0.533			
Resp_3	0.552			
Resp_4	0.847			
Resp_5	0.825			
Resp_6	0.631			
Resp_7	0.666			
Human Capital		0.900	0.919	0.559
HC_1	0.681			
HC_2	0.780			
HC_3	0.610			
HC_4	0.739			
HC_5	0.814			
HC_6	0.809			
HC_7	0.772			
HC_8	0.796			
HC_9	0.700			

	Loadings	Alpha	CR	AVE
Administrative Innovation		0.917	0.936	0.709
Innov_1	0.823			
Innov_2	0.918			
Innov_3	0.857			
Innov_4	0.783			
Innov_5	0.781			
Innov_6	0.881			

Note. CR = Composite Reliability; AVE = Average Variance Extracted

Cronbach’s alpha and composite reliability (CR) are used to measure reliability. The instrument is considered reliable if Cronbach’s alpha and CR values are greater than 0.7 (Hair et al., 2010). Since the values for alpha and CR are greater than 0.7 (see Table 3), it reflects that the instrument is reliable. Average variance extracted (AVE) is used to measure the convergent validity of the instrument. Convergent validity exists if AVE is greater than 0.5 (Ringle et al., 2020). Since the AVE value for all the constructs is greater than 0.5, it establishes the convergent validity of the instrument (see Table 3). Hetrotrait-Monotrait (HTMT) ratio procedure is used to establish the discriminant validity. Hensler et al. (2015) argued that discriminant validity exists if the value for the HTMT ratio is less than 0.90. Hence, the instrument possesses discriminant validity as the values for the HTMT ratio of all the constructs are less than the stated cutoff value (see Table 4).

Table 4

Discriminant Validity using HTMT

	MO	HC	Innovation
Market Orientation			
Human Capital	0.720		
Innovation	0.719	0.658	

Hypotheses Testing

Simple linear regression was performed to test the first and second hypotheses. The first hypothesis states that market orientation (MO) positively affects innovation, whereas the second hypothesis states that human capital (HC) positively affects innovation. The results of linear regression are given in Table 5.

Table 5*Regression Models*

Regression Models	R ²	Adjusted R ²	Beta	Sig	Durbin-Watson	Collinearity	
						Tolerance	VIF
MO → Innovation	.310	.304	.557	.000	1.838	1.000	1.000
HC → Innovation	.257	.252	.507	.000	1.761	1.000	1.000

According to the above table, the adjusted R Square value of the MO - Innovation linear regression model is 0.304. This value shows that the independent variable in the first model, that is, market orientation explains 30.4% variation caused in innovation. The value of the standardized beta coefficient shows that one unit change in MO brings about 0.557 unit change in innovation. The positive value indicates that there is a positive relationship between MO and innovation. The significance value is less than 0.05 ($p < 0.05$), indicating that the results are significant and generalizable.

The adjusted R square value for the second model is 0.252 and its standardized beta coefficient is 0.507, which indicates that one unit change in HC brings about 0.507 unit change in innovation. The p -value for this model is also less than 0.05, which shows that the model is significant and generalizable.

Mediation Model

According to Baron and Kenny (1986), there are three requirements for a variable to be considered as a mediator. Firstly, the predictor (X) has a significant impact on the outcome (Y) variable (called path c). Path c is referred to as the total effect. Secondly, the predictor (X) has a significant effect on the mediating (M) variable (path a). Thirdly, the mediator (M) has a significant effect on the outcome (Y) variable (path b). Mediation does not exist if any one of these three conditions is missing. However, for mediation to exist the effect of X on Y while controlling for M should be insignificant, that is, when a mediator is included the effect of the predictor on the outcome variable should become insignificant (path c). This effect is termed as the indirect effect. If the indirect effect is insignificant, then the mediation is said to be complete. Otherwise, it is referred to as partial mediation.

To test these conditions, Preacher and Hayes (2004) developed macro Sobel which measures the total, direct and indirect effect of the variables involved in

mediation following the procedure given by (Baron & Kenny, 1986). It also calculates the z statistic for the Sobel test which determines the presence of mediation. In a nutshell, macro provides comprehensive statistics to validate whether mediation is present or not.

The macro was run using SPSS 20. Test statistics generated by the syntax are as follows:

DIRECT AND TOTAL EFFECTS

	Coefficient	s.e.	T	Sig (two)
b(YX)	.7823	.1024	7.6389	.0000
b(MX)	.6787	.0818	8.2942	.0000
b(YM.X)	.3352	.1062	3.1572	.0020
b(YX.M)	.5548	.1225	4.5296	.0000

INDIRECT EFFECT AND SIGNIFICANCE USING NORMAL DISTRIBUTION

	Value	s.e.	LL95CI	UL95CI	z	Sig(two)
Effect	.2275	.0776	.0754	.3796	2.9321	.0034

According to the results, b(YX) shows the total effect of MO on innovation which is path ‘c’. This effect is significant. Similarly, b(MX) is path ‘a’ which measures the effect of MO on HC. This relationship is also significant. Moreover, b(YM.X) is the path ‘b’ that measures the effect of HC on innovation while controlling for the effect of MO. As described above, for the mediation to exist, the first three relationships must be significant. However, the last relationship, that is, b(YX.M) (which measures the indirect effect of MO on innovation while controlling for the effect of HC) is significant. This means that mediation is partial. The last relationship should be insignificant for HC to mediate the relationship between MO and innovation, fully. Further, the indirect effect of MO on innovation via HC is 0.2275, which is the path ‘a’ x path ‘b’ (0.6787*0.3352). The indirect effect and z-statistic value for the Sobel test are also significant, further confirming mediation in the model. Hence, the results of the mediation model support the last hypothesis that HC mediates the relationship between MO and innovation, although partially.

Table 6*Summary of the Results*

Hypotheses	Results
H1: Market orientation (MO) has a positive effect on firm innovation.	Supported
H2: Human capital (HC) has a positive effect on firm innovation.	Supported
H3: Human capital (HC) mediates the relationship between MO and innovation.	Supported

Based on the results of the study, Table 6 summarizes the findings regarding the acceptance of all the proposed hypotheses of the current research.

Discussion

The aim of this study was to investigate the mediating role of HC in the MO – innovation relationship. The study hypothesized and tested whether MO and HC independently affect innovation in an organization and whether HC mediates the relationship between MO and innovation. Literature shows that both MO and HC have a positive relationship with innovation. However, as described earlier, no research has been conducted yet to find out if the relationship between MO and innovation is mediated by HC or not.

There has been extensive empirical research about the antecedents of technical (product and process) innovation; however, evidence and studies related to administrative innovation are scarce. Hence, data was collected from the business organizations of Pakistan to test the mediating role of HC in the relationship between MO and administrative innovation. The findings of the research support the claim that MO and HC lead to administrative innovation, while HC mediates the relationship between MO and administrative innovation.

Innovation is considered as a critical resource to gain competitive advantage over other firms owing to its context-specific nature (Camisón-Zornoza et al., 2004). Although the relevant literature mentions many predictors and antecedents of innovation, this study focused only on market orientation (MO) and human capital (HC). The findings revealed that MO does positively affect a firm's ability to innovate. With its outward focus, that is, on the market, customer, supplier, competitor, and technology, MO generates information and shares it within the firm, while the firm responds to the external changing conditions through

innovation, either technical or administrative. Not only theory but empirical evidence also supports the effect of MO on innovation.

The findings of this study also support the previous findings regarding the MO-innovation relationship. Some authors found that not only MO as a complete construct affects innovation but its constituent components (Ho et al., [2018](#); Alhakimi & Mahmoud, [2020](#)), as suggested by Narver and Slater ([1990](#)), also affect the innovative outcomes of a firm. When firms generate information related to their customers and competitors, it affects their ability to innovate. It provides them with the information required for responding to the market in terms of improved or latent products (Aydin, [2020](#)). Ho et al. ([2018](#)) argued that the degree of coordination within different departments of a firm ensures and creates a culture of knowledge sharing and improved communication within the respective firm, helping the information generated from the market to be shared within it. Thus, MO leads to innovation in a firm. Chung ([2019](#)), Prifti and Alimehmeti ([2017](#)) also concluded that MO and its dimensions, that is, intelligence generation, dissemination, and responsiveness (Kohli & Jaworski, [1990](#)) lead to innovation.

Just like MO, HC was also found to be a predictor of innovation in firms. Through organizational learning HC enables a firm to learn and generate new knowledge, thus resulting in innovations taking place within the firm. The findings of this research conform to prior findings suggesting a positive relationship between HC and innovation. Bonesso et al. ([2020](#)) found that firms with a higher degree of intangible HC achieve a higher degree of innovation diversification. This suggests that such firms are more competitive and innovative in their approach.

HC transforms the effect of organizational learning into innovation. Thus, HC acts as a separating mechanism. It contextualizes the competitive advantage of organizational learning, since it is a firm's contextual resource that remains at the core of creating organizational knowledge and learning (Damanpour, [1991](#)). Firms, as entities, do not have the ability to learn; rather, they learn through their employees. Hence, when an organization learns it develops the knowledge, skills, and abilities of its employees which helps in innovation. Therefore, firms with more employees with a better educational background and experience tend to be more innovative in their approach. Sun et al. ([2020](#)) and Jibir and Abdu ([2020](#)) also supported this assertion.

HC comprises the overall or collective knowledge, skills, and abilities of a firm's employees, an increase or improvement in any or all of these factors will improve the level of HC in the firm. The increase or development of HC is reflected in the quality and quantity of innovations taking place in the firm.

The third hypothesis of the current research that aims to test the mediating role of HC in the MO – innovation relationship is also accepted. The findings revealed that HC partially mediates the relationship between MO and innovation. Empirical evidence in this research supports the theorized relationship stating that MO develops HC through organizational learning, which ultimately affects the innovative ability of the firm. MO has an outward focus and it generates information from the outside environment. On the contrary, HC focuses on the firm's internal resources, that is, employees' knowledge, skills, and abilities. MO and HC provide a relatively holistic picture of a firm's innovating process, where MO generates information from outside the organization. Its HC transforms this information into organizational knowledge within the firm, leading to innovation. Thus, in doing so, HC mediates the effect of a firm's MO on its innovation.

Looking closely, the findings of the Sobel test showed that path 'a' of the mediation model is significant, which indicates that MO has a positive effect on a firm's HC. This suggests and supports the argument given above that the degree of MO of a firm leads to the development of HC in the firm. Kasim et al. (2018) argued that if MO is the input and innovation is the output, then organizational learning is the process through which a firm achieves this output. Moreover, when an organization learns, it entails acquiring new knowledge, skills, and abilities. This results in developing HC. In a nutshell, the significant result of the path 'a' supports the claim that a firm's MO leads to the development of its HC.

Furthermore, the significant results of path 'b' and 'c' corroborate the results of the first and second hypotheses, that is, the positive effect of HC and MO on innovation. Path 'c' of the Sobel test shows that the effect of MO on innovation while controlling for HC is significant. This indicates that HC only partially mediates the relationship between MO and innovation.

It is argued here that complete mediation generally does not exist in social sciences, particularly in work related studies (Baron & Kenny, 1986; Tourigny & Le, 2004). Partial mediation suggests the possibility of the existence of a variable(s) that may mediate the relationship between the predictor variable and the outcome variable. In this study, there may also be other variables besides HC that may mediate the relationship between MO and innovation. Since HC is organizational knowledge that resides in employees, other organizational knowledge in the form of relationships (relational capital) and that residing in the structures, policies, and norms of the firms (structural capital) may also play a mediating role in the MO – innovation relationship. Thus, intellectual capital as a complete construct should be studied to test if it completely mediates the MO – innovation relationship.

Practical Implications

Aside from providing empirical evidence regarding the theorized relationships, this research has some practical implications also. Firstly, managers should not focus on technical innovation only or give too little importance to administrative innovation as most of the organizational innovations are administrative in nature (Ganter & Hecker, [2014](#)). Further, the results also show that MO and HC also affect administrative innovation. Hence, for organizations operating in a competitive environment where technical innovations are limited, their managers can gain competitive advantage by innovating useful administrative structures and policies. Therefore, managers should strive to maintain a balanced approach towards the adoption of technical and administrative innovation.

Secondly, MO is a necessity for those firms which face market competitiveness. MO is an organization-wide activity that involves generating and sharing information and responding to it in the form of innovation. A firm becomes a market-oriented firm only when it carries out all such activities. Merely generating information related to customers or competitors does not make a firm market-oriented unless and until this information is shared among the employees and the firm acts upon it to respond accordingly. Thus, for managers to benefit from MO, it should be implemented in the full.

Lastly, this research shows that the HC of the firm partially mediates the effect of MO on innovation. Therefore, to improve the innovative ability of their firms managers should focus on HC as it is the HC of a firm that generates, shares and responds to the market information. Though MO improves and develops the HC of a firm; however, if the HC of a firm is already low, it may not utilize the full potential of its MO in terms of innovation. Therefore, managers should not only improve their orientation towards the market, rather they should also strive to improve their HC by hiring educated, experienced and skilled employees. If firms want to gain and sustain competitive advantage over rival firms, they need to invest not only in their orientation towards the market but also in their intangible asset of HC. An investment in both these resources will enhance a firm's ability to innovate and remain competitive over a longer period of time.

Conclusion

Research on innovation needs no justification as several academics and practitioners have admitted its importance for any firm (Damanpour et al., [2009](#)). Further, studies showed that a firm's survival and performance are affected by its ability to innovate. It enables it to grow economically and remain competitive over

a long period of time (Rosenbusch et al., [2011](#)). Thus, factors which improve a firm's innovative ability have been studied by different researchers. MO and HC are among those factors which affect a firm's ability to innovate.

This study set out to achieve two goals. The first and the key goal of the study was to find out how MO and HC interact with each other when put together in a model to predict innovation. At first, this study theoretically established a mediating link between MO and HC, where HC mediates the MO – innovation relationship. The mediating role of HC was drawn from the theory of organizational learning. Literature established that market-oriented firms are primarily learning organizations, as MO supports a culture that promotes organizational learning. As firms learn through their employees (individuals), it entails acquiring and developing the knowledge, skills, and abilities (KSAs) of their employees. Hence, through its learning ability, a market-oriented organization develops and improves the KSAs of its employees, thus enhancing its innovative ability. The empirical results of the current study support the proposed relationship.

The second objective was to examine the administrative aspect of innovation. Innovation in firms is generally categorized as technical innovation (related to products or processes) and administrative innovation (related to the structures, policies, and practices). Literature showed that most research focused on technical innovation instead of administrative innovation. This has resulted in limiting the body of literature available regarding administrative innovation in the firms. However, most innovations taking place in firms are administrative in nature (Ganter & Hecker, [2014](#)). Hence, this research contributes to the scarce knowledge of administrative innovation by studying the administrative dimension of organizational innovation. The results revealed that the predictors of technical innovation, that is, MO and HC also predict administrative innovation.

Limitations and Future Directions

The current research has some limitations. Firstly, this study employed the survey method to test the relationships. The results derived from surveys usually suffer from common method variance, which exists due to the measurement method used and not because of the constructs used to measure the concept (Podsakoff et al., [2003](#)). Secondly, this study is cross-sectional. A cross-sectional study limits the causality of the relationship. Longitudinal studies need to be conducted in the future to establish the causality of the MO – innovation relationship. Thirdly, HC only partially mediates the MO – innovation relationship. Partial mediation means that there may be other variables (s) mediating the effect of MO on innovation. This research focused on the HC aspect of intellectual capital only, although intellectual

capital comprises human, structural and relational capital. Hence, there is a possibility that intellectual capital as a whole may be completely mediating the MO – innovation relationship. Therefore, future research may be conducted using other intellectual capital constructs to find out how they relate to the above relationship.

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Appendix A

Measurement Scales

Market Orientation

- 1 We poll end users at least once a year to assess the quality of our products and services.
- 2 In our business unit, intelligence on our competitors is generated independently by several departments
- 3 We periodically review the likely effect of changes in our business environment (e.g., regulation) on customers.
- 4 In this business unit, we frequently collect and evaluate general macro-economic information (e.g., interest rate, exchange rate, GDP, industry growth rate, inflation rate).
- 5 In this business unit, we maintain contacts with officials of Government and regulatory bodies (e.g., SECP, FBR, PPRA, Ministry of Commerce) in order to collect and evaluate pertinent information.
- 6 In this business unit, we collect and evaluate information concerning general social trends (e.g., environmental consciousness, emerging lifestyles) that might affect our business.
- 7 In this business unit, we spend time with our suppliers to learn more about various aspects of their business (e.g., manufacturing process, industry practices, and clientele).
- 8 In our business unit, only a few people are collecting competitor information. (R)
- 9 Marketing personnel in our business unit spend time discussing customers' future needs with other functional departments.
- 10 Our business unit periodically circulates documents (e.g., reports, newsletters) that provide information on our customers.
- 11 We have cross-functional meetings very often to discuss market trends and developments (e.g., customers, competition, suppliers).
- 12 We regularly have interdepartmental meetings to update our knowledge of regulatory requirements.
- 13 Technical people in this business unit spend a lot of time sharing information about technology for new products with other departments.
- 14 Market information spreads quickly through all levels in this business unit.
- 15 For one reason or another, we tend to ignore changes in our customers' product or service needs. (R)
- 16 The product lines we sell depend more on internal politics than real market needs. (R)

- 17 We are slow to start business with new suppliers even though we think they are better than existing ones. (R)
- 18 If a major competitor were to launch an intensive campaign targeted at our customers, we would implement a response immediately.
- 19 The activities of the different departments in this business unit are well coordinated.
- 20 Even if we came up with a great marketing plan, we probably would not be able to implement it in a timely fashion. (R)
- 21 If a special interest group (e.g., consumer group, environmental group) were to publicly accuse us of harmful business practices, we would respond to the criticism immediately
- 22 We tend to take longer than our competitors to respond to a change in regulatory policy. (R)

Human Capital

- 1 The competence of our employees as a whole is equal to the most ideal level we could ever hope to achieve.
- 2 Our business planners are continually on schedule with their new business development ideas. (i.e. we generally meet target dates)
- 3 Our organization consistently comes up with great new ideas.
- 4 The firm supports our employees by constantly upgrading their skills and education whenever each of them feels it is necessary.
- 5 The employees of our firm are considered creative and bright.
- 6 Our employees are widely considered as the best in the whole industry.
- 7 Our employees consistently perform at their best.
- 8 Individuals learn from others.
- 9 The firm gets the most out of its employees when they cooperate with each other in team tasks.

Innovation

- 1 Rules and procedures within our organization are regularly renewed.
- 2 We regularly make changes to our employees' tasks and functions.
- 3 Our organization regularly implements new management systems.
- 4 The policy with regard to compensation has been changed in the last three years.
- 5 The intra- and inter-departmental communication structure within our organization is regularly restructured.
- 6 We continuously alter certain elements of the organizational structure.