

IMPACT OF HUMAN CAPITAL ON PRODUCT INNOVATION PERFORMANCE IN SMES OF KHYBER PAKHTUNKHWA: MEDIATING ROLE OF ORGANIZATIONAL LEARNING CAPABILITY

¹Dr. Azmat Ali Shah

²Sharafat Jamala

³Faraz Khan

⁴Sardar Ali

⁵Shahid Samad Khan

¹Assistant Professor, Iqra National University, Peshawar, KP

²PhD Scholar, Qurtaba University of Science and Information Technology, KP.

³M.phill Scholar, Qurtaba University of Science and Information Technology, KP.

⁴Lecturer, Shaheed Benazir Bhutto University Sheringal, Pakistan

⁵Phd Scholar Institute of Management Sciences Peshawar

Azmat.Ali.Shah@inu.edu.pk Sharafat_jamala@yahoo.com frazmomand@gmail.com

sardarali@sbbu.edu.pk, shahid.samad@imsciences.edu.pk

Abstract

This study investigates the impact of human capital on product innovation performance in SMEs in KP. It examines the mediating role of organizational learning capability, addressing a significant contextual and theoretical gap in developing economies. A quantitative, cross-sectional design was used to collect data from 379 employees across various SMEs in the region. Using well-established scales, we measured HC, OLC, and PIP. The data were analyzed using the Baron and Kenny (1986) mediation analysis framework via SPSS. The results confirm that HC has a strong, positive effect on PIP ($\beta=.98$, $p<.001$). More importantly, the findings reveal a partial mediating effect of OLC on this relationship. These findings highlight that possessing a skilled workforce is crucial for innovation. This effect is significantly amplified when organizations have established routines for knowledge acquisition. This study offers practical implications for SME leaders and policymakers, suggesting that to foster sustained innovation, firms must not only invest in their human capital but also cultivate a robust learning-oriented culture.

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Corresponding Authors*:

Dr. Azmat Ali Shah*

INTRODUCTION

In today's increasingly competitive global landscape, the shift towards knowledge-intensive economies compels firms to innovate continuously to sustain a competitive advantage (Teece et al., 1997). Small and Medium Enterprises (SMEs) are indispensable to economic growth, particularly in developing nations where they form the backbone of the economy (Burhan, 2018; Kayanula & Quartey, 2000). In Pakistan, SMEs represent approximately 90% of all businesses and are a primary source of employment (Pakistan Bureau of Statistics [PBS], 2011). However, their ability to survive and grow hinges on their Product Innovation Performance (PIP)—the successful and efficient generation and implementation of new products (Manthey et al., 2021).

The Resource-Based View (RBV) of the firm posits that internal resources of the firm are central to achieving superior performance. Further, the said resources must be valuable, rare, and difficult to imitate (Barney, 1991; Wernerfelt, 1984). Among these, Human Capital (HC)—the collective knowledge, skills, and intellectual agility of employees—is paramount (Becker, 1964; Sharabati et al., 2010). A strong foundation of HC is a critical antecedent to a firm's innovative capabilities, as skilled employees are better equipped for the complex problem-solving required for innovation (Subramaniam & Youndt, 2005; Dakhli & De Clercq, 2004).

However, the process through which the potential of HC translates into tangible innovative outcomes often remains a "black box" in management literature (Jiang et al., 2013). This study proposes that Organizational Learning Capability (OLC) is the important phenomena that mediates this relationship. OLC is a dynamic capability that is based on an organization's inherent ability to acquire and apply new knowledge. The knowledge is applied through practices like socialization and participative decision-making (Chiva et al., 2007). OLC enables firms to enable their human capital to create new value. This ultimately enhances innovation performance of the firm (Alegre & Chiva, 2008; Hsu & Fang, 2009).

PROBLEM STATEMENT

SMEs of KP face significant challenges that hinder their ability to leverage effectively. The sector has alarmingly high failure rate of around 90%. This failure rate can be attributed to a lack of trained human resources and weak management skills (Ullah et al., 2011). SMEs in the KP region encounter persistent skill barriers and financial constraints that hinder the adoption of innovation (Ali & Shah, 2017). These issues are compounded by informal management practices and external challenges related to infrastructure and operational costs, even within prioritized development zones (Burhan, 2018; Liaquat et al., 2025).

While the positive link between HC and innovation is acknowledged, empirical research on this relationship remains scarce in developing countries like Pakistan (Van Uden et al., 2014). Consequently, a significant contextual and theoretical gap exists. There is a critical need to understand the complete causal chain—from HC to PIP—and to empirically test the specific indirect mechanism through which OLC facilitates this conversion within the challenging and under-researched context of SMEs in Khyber Pakhtunkhwa. This study aims to address this gap by examining this mediated relationship, thereby contributing to the RBV and Dynamic Capabilities literature while offering practical insights for SME leaders and policymakers in a key developing economy.

RESEARCH QUESTIONS

To address the identified research gap, this study seeks to answer the following questions:

1. Does Human Capital positively influence Product Innovation Performance in the context of SMEs in Khyber Pakhtunkhwa?
2. Does Organizational Learning Capability mediate the positive relationship of Human Capital and Product Innovation Performance in this context?

LITERATURE REVIEW

This study is anchored in two complementary theoretical perspectives: the Resource-Based View (RBV) and the theory of Dynamic Capabilities. The RBV posits that a firm's sustained competitive advantage is derived from its unique internal resources that are valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 1991; Wernerfelt, 1984). Intangible assets like human capital are considered paramount to success. But merely possessing such resources is not enough in dynamic markets. The theory of Dynamic Capabilities extends the RBV by focusing on a firm's ability to get adapted to rapid change (Teece et al., 1997). This study assumes Organizational Learning Capability as a critical dynamic capability. The OLC enables firms to leverage their human capital resources to generate innovative outcomes.

HUMAN CAPITAL AND PRODUCT INNOVATION PERFORMANCE

Human Capital (HC) refers to the stock of knowledge and competencies embodied in an organization's employees (Becker, 1964). It is a strategic intangible asset developed through education, training, and experience. It represents the intellectual agility of the workforce (Sharabati et al., 2010). A highly developed base of human capital enhances a firm's absorptive capacity i.e. its ability to recognize, assimilate, and apply new external knowledge. It is a fundamental input for innovation (Cohen & Levinthal, 1990).

Product Innovation Performance (PIP) is a measure of a firm's ability of launching new products and improving existing ones (Zhang et al., 2023). It is a multidimensional construct reflecting both the effectiveness and efficiency of a firm's innovation efforts (Alegre et al., 2006; Wheelwright & Clark, 1992). In competitive environment, strong PIP is crucial for firm survival, growth.

Existing research establishes a direct and positive relationship between Human Capital and innovative outcomes of a firm. Firms with superior human capital endowments are better positioned to generate novel ideas and solve the complex problems. (Subramaniam & Youndt, 2005). Empirical studies confirm that investment in employee training and development is conducive to innovative output. This is even more important for developing countries (Van Uden et al., 2014). Knowledge and skills of employees are significant determinants of a firm's overall innovative performance (Samad, 2020; Dakhli & De Clercq, 2004). Therefore, we propose our first hypothesis:

- *H₁: Human Capital has a positively influences Product Innovation Performance.*

THE MEDIATING ROLE OF ORGANIZATIONAL LEARNING CAPABILITY

Although Human capital provides the potential for innovation but it is not enough. This potential must be activated and channeled through organizational processes. Organizational Learning Capability (OLC) is the key mechanism through which this process occurs. Organizational Learning Capability is defined as the set of organizational characteristics and managerial practices that facilitate the learning process. This leaning process include experimentation and participative decision-making (Chiva et al., 2007; Fiol & Lyles, 1985). It is the institutionalized ability to acquire and apply knowledge.

Organizational Learning Capability functions as a dynamic capability. It enables a firm to renew its competencies and adapt to environmental changes (Teece et al., 1997). It bridges the gap between individual-level knowledge and organizational-level outcomes. A

high degree of OLC allows a firm to effectively integrate the tacit knowledge of its employees to organizational goals. This process assimilates external information, and codify this learning into new products and processes. Existing research shows positive impact of OLC on product innovation performance (Alegre & Chiva, 2008; Uğurlu & Kurt, 2016).

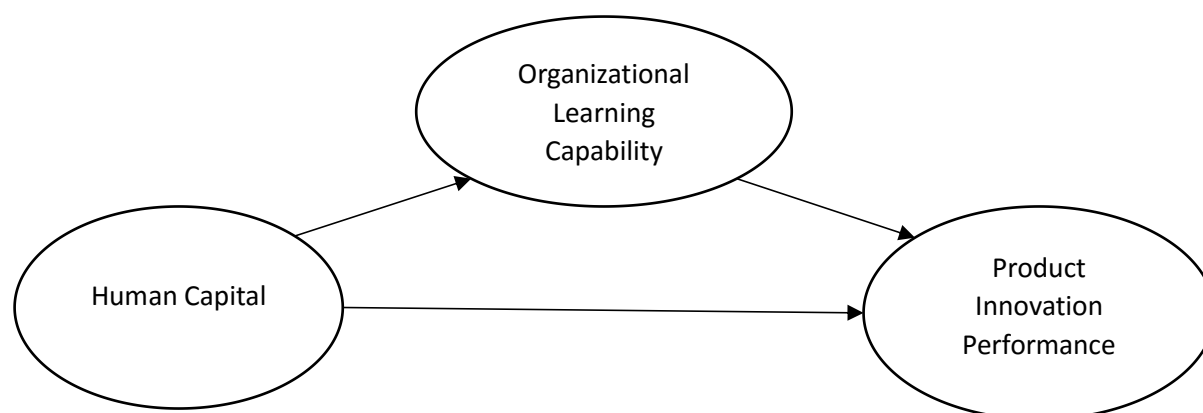
Organizational Learning Capability has been identified as a key mediator linking intellectual resources to innovation. Hsu and Fang (2009) found that OLC fully mediates the relationship between a firm's human capital and its new product development performance. Their study stated that HC influences OLC and this process ultimately leads to innovative outcomes. Another research confirms that OLC acts as a necessary bridge for converting human resources into strategic success. it mediates the link between green human capital and business sustainability (Sabir et al., 2020). Without a strong learning capability, the value of human capital may not be fully realized in terms of innovation. On the Bases of above discussion, we propose our second hypothesis:

- *H₂: Organizational Learning Capability mediates the positive relationship of Human Capital and Product Innovation Performance.*

CONCEPTUAL FRAMEWORK

The literature reviewed above leads to the development of the following conceptual framework, which will be empirically tested in this study. The framework posits a direct path from Human Capital to Product Innovation Performance, and a significant indirect path through the mediating variable of Organizational Learning Capability.

The proposed model is visualized as follows:



RESEARCH METHODOLOGY

This cross-sectional study is based on quantitative research design to investigate the relationships between human capital, organizational learning capability, and product innovation performance. A deductive approach has been used. Data was collected at a single point in time through a structured survey questionnaire (Saunders et al., 2012).

POPULATION AND SAMPLING

The target population for this study comprised employees of Small and Medium Enterprises (SMEs) operating within KP. Due to the absence of a comprehensive and accessible official list of all SMEs and their employees in the region, a non-probability convenience sampling technique was adopted. Convenience sampling allows for the recruitment of participants who are readily accessible and meet the study's criteria (Etikan et al., 2016). Questionnaires were distributed to employees at various levels within different

SMEs. The inclusion criterion for participation was a minimum of one year of work experience in their respective. A total of 384 questionnaires were distributed. 379 valid responses were received.

MEASUREMENT OF VARIABLES

The survey measurement instrument consisted of well-established scales adopted from published researches. Five-point Likert scale, was used for measurement of variables.

- **Human Capital (HC):** The independent variable, Human Capital, was measured using an 8-item scale adapted from the study by Sharabati et al. (2010).
- **Organizational Learning Capability (OLC):** Organizational Learning Capability, was measured using a 6-item scale developed by Chiva et al. (2007).
- **Product Innovation Performance (PIP):** Product Innovation Performance, was assessed using a 9-item scale from Alegre et al. (2006).

DATA ANALYSIS TECHNIQUES

The collected data were analyzed using the SPSS. The analysis was conducted in two main stages. First, descriptive statistics were calculated to summarize the demographic characteristics of the sample. Second, the research hypotheses were tested using regression analysis.

To test the mediating effect of Organizational Learning Capability (H₂), the four-step procedure of Baron and Kenny (1986) was followed:

1. **Step 1:** A simple regression was done to test the direct effect of the independent variable (i.e. Human Capital) on the dependent variable (i.e. Product Innovation Performance). This establishes the total effect (Path c).
2. **Step 2:** A simple regression was run to examine the relationship between the independent variable and the mediating variable (i.e. Organizational Learning Capability) (Path a).
3. **Step 3:** A multiple regression analysis was performed with both the independent variable and the mediating variable predicting the dependent variable. This step tests the effect of the mediator on the dependent variable while controlling for the independent variable (Path b).
4. **Step 4:** The effect of the independent variable on the dependent variable in the third step (Path c') was compared to its effect in the first step (Path c). Mediation is established if Path c' is significantly smaller than Path c. If Path c' becomes non-significant, it indicates full mediation; if it remains significant but is reduced, it indicates partial mediation.

RESULTS AND DISCUSSION

This section presents the results of the statistical analysis, followed by a discussion of the findings in relation to the research hypotheses. The final sample consisted of 379 employees from SMEs in Khyber Pakhtunkhwa. The mean scores for Human Capital (M = 4.28), Organizational Learning Capability (M = 4.21), and Product Innovation Performance (M = 4.30) were all high, suggesting positive perceptions of these constructs among the respondents.

The internal consistency of the measurement scales was assessed using Cronbach's Alpha. As shown in Table 1, the reliability coefficients for Human Capital ($\alpha = .903$), Product Innovation Performance ($\alpha = .917$), and Organizational Learning Capability ($\alpha = .887$) all exceeded the recommended threshold of .70, indicating excellent reliability and internal consistency of the measures.

TABLE 1: RELIABILITY ANALYSIS (CRONBACH'S ALPHA)

Variable	Cronbach's Alpha
Human Capital	.903
Product Innovation Performance	.917
Organizational Learning Capability	.887

HYPOTHESIS TESTING

The hypotheses were tested using the mediation procedure recommended by Baron and Kenny (1986). The results of the regression analyses are summarized in Table 3.

TABLE 2: RESULTS OF REGRESSION ANALYSIS FOR MEDIATION

Model	Dependent Variable	Independent Variable(s)	β	Std. Beta	t-value	R ²
1 (Path c)	PIP	Human Capital	.98**	0.88	36	0.71
2 (Path a)	OLC	Human Capital	.78**	0.75	24.38	0.61
3 (Paths b & c')	PIP	Human Capital Org. Learning Capability	.67** .31**	0.59 0.36	18.8 11.13	0.83

*Note: PIP = Product Innovation Performance; OLC = Organizational Learning Capability.

*p < .01.

Testing H₁: The first hypothesis predicted a positive relationship of Human Capital with Product Innovation Performance. Results from Model 1 show that Human Capital has significant positive effect on Product Innovation Performance ($\beta = .98, p < .001$). Human Capital alone explained 71% of the variance in PIP ($R^2 = .71$). This result provides strong support for H₁.

Testing H₂: The second hypothesis proposed that Organizational Learning Capability mediates the relationship of Human Capital with Product Innovation Performance.

- **Step 1** (Model 1, Path c) was completed above, confirming a significant total effect.
- **Step 2** (Model 2, Path a) showed that Human Capital has a significant positive effect on the mediator, Organizational Learning Capability ($\beta = .78, p < .001$).
- **Step 3** (Model 3) included both Human Capital and Organizational Learning Capability as predictors of Product Innovation Performance. Findings show that Organizational Learning Capability has a significant positive effect on Product Innovation Performance (Path b: $\beta = .31, p < .001$) after controlling for Human Capital.
- **Step 4** involved comparing the effect of Human Capital on Product Innovation Performance before and after introducing the mediator. The direct effect of Human Capital in Model 3 (Path c': $\beta = .67, p < .001$) remains significant but is substantially reduced from the total effect in Model 1 (Path c: $\beta = .98$). This pattern confirms a **partial mediation**. Therefore, H₂ is supported.

DISCUSSION

This study aimed to investigate the mechanism through which human capital influences product innovation performance in the challenging context of SMEs in Khyber Pakhtunkhwa. The results provide robust support for the proposed conceptual model. The support for H₁ aligns with the core tenets of the Resource-Based View of the firm. It confirms human capital is a vital strategic resource for innovation (Barney, 1991). A knowledgeable and skilled workforce directly drives new product success in SMEs. This finding is consistent with prior research (Samad, 2020; Subramaniam & Youndt, 2005).

The most significant contribution of this study is analysis of mediating role of Organizational Learning Capability. This study illuminates the connection between human

resources and innovation, supporting the Dynamic Capabilities framework (Teece et al., 1997). The finding of partial mediation is particularly insightful. It suggests that an organization's concern for experimentation and learning significantly amplify the innovation. This result empirically validates the findings of previous studies in different contexts (Hsu & Fang, 2009; Sabir et al., 2020). For SMEs in KP, this implies that merely hiring skilled individuals is insufficient. They must also cultivate a learning-oriented culture to fully capitalize on their human capital and drive innovation.

CONCLUSION

The study concludes that human capital is a significant predictor of product innovation performance. The findings strongly confirm the partial mediating role of organizational learning capability in this relationship. This indicates that while investing in human capital directly benefits innovation, the effect is amplified when SMEs also cultivate a strong capacity for organizational learning. To achieve sustained product innovation firms must not only acquire skilled employees but also promote culture of innovation

RECOMMENDATIONS

SMEs in KP should adopt a dual-pronged strategy focused on both human capital development and organizational learning to enhance product innovation. They must prioritize the hiring of skilled personnel and invest consistently in training and development programs. Secondly, SMEs should proactively create a culture of organizational learning. By strategically connecting their human capital investments with a robust organizational learning capability, SMEs can build foundation for long-term growth and competitiveness.

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