



Meta-Analytic Review of Knowledge-Oriented Leadership and Human Resource Development: Pathways to Sustainable Competitive Advantage in the Industry Sector

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Abstract

In an increasingly competitive industrial landscape, organizations must enhance leadership and human resource capabilities to drive innovation and sustain long-term competitive advantage. This research examines the relationship between knowledge-oriented leadership, human resource development, and organizational innovation in achieving sustainable competitive advantage in the industry sector. The research aims to assess how leadership and HR development contribute to innovation and long-term competitiveness. Using a meta-analytic approach, this research analyzes 30 empirical articles indexed in Scopus Q1–Q3 from Springer, Wiley, MDPI, and Taylor & Francis. Articles were identified through keywords such as "Knowledge-Oriented Leadership," "Human Resource Development," and "Industry Sector." Data were processed using meta-analysis techniques, including forest and funnel plots, to measure the strength and consistency of relationships among variables. The results indicate that knowledge-oriented leadership and human resource development significantly enhance organizational innovation, thereby reinforcing sustainable competitive advantage. The forest and funnel plot scores, averaging around 0.5, suggest a moderate but positive correlation within the industry sector. These findings emphasize the need for industry leaders to strengthen leadership competencies and invest in human resource development to foster continuous innovation. The research also calls for future research to explore additional moderating variables that may further influence these relationships.

Keywords: Knowledge-Oriented Leadership, Human Resource Development, Organizational Innovation, Sustainable Competitive Advantage, Industry sector Industry.

INTRODUCTION

In today's competitive global economy, organizations in the Industry sector are constantly looking for ways to maintain and enhance their competitive advantage. Sustainable competitive advantage (SCA) has emerged as a key driver for long-term success, particularly in industries that are heavily influenced by technological advancement and shifting market demands, such as the Industry sector industry. One of the most critical determinants of SCA is the leadership style adopted within organizations. Knowledge-oriented leadership (KOL), which emphasizes the acquisition, dissemination, and application of knowledge within an organization, has been identified as a vital component in fostering innovation and sustaining competitive advantage. KOL enables organizations to continuously adapt and innovate, which is essential for maintaining a

sustainable edge in an increasingly complex and dynamic business environment (Banmairuoy et al., 2022). In addition, studies have shown that KOL plays a significant role in developing the necessary capabilities to foster innovation through human resource development and organizational culture. This further strengthens the competitive advantage of organizations in rapidly evolving markets (Kadarsah et al., 2023). Another pivotal factor influencing SCA is human resource development (HRD), which plays a crucial role in enhancing the skills and competencies of employees, thus improving organizational performance (Banmairuoy et al., 2022). HRD is seen as an investment in human capital, and when effectively implemented, it contributes significantly to the development of organizational capabilities that are difficult for competitors to replicate (Latif et al., 2021). Effective HRD programs, particularly those aimed at fostering leadership skills, have been linked to higher levels of employee engagement, motivation, and overall organizational performance (Lee et al., 2021).

Recent studies have also highlighted the role of organizational innovation (OI) as a mediator between leadership practices and sustainable competitive advantage. Organizational innovation (OI) plays a critical role as a mediator between leadership practices and sustainable competitive advantage. OI involves the development and implementation of new ideas, processes, products, or services that allow organizations to differentiate themselves in the marketplace. As highlighted by (Banmairuoy et al., 2022), OI enables firms to maintain a competitive edge, particularly in dynamic industries where technological advancements and regulatory shifts occur frequently. This is particularly true in industries where the ability to innovate continuously is vital for staying ahead of competitors. According to (Gürlek & Cemberci, 2020), OI empowers organizations to respond swiftly to changing market demands by offering innovative solutions that align with the evolving needs of customers. Thus, fostering a culture of innovation, supported by effective leadership practices, becomes essential for organizations aiming to sustain their competitive advantage and ensure long-term success in a rapidly changing environment of Industry.

While previous research has examined the individual impacts of knowledge-oriented leadership (KOL), human resource development (HRD), and organizational innovation (OI) on organizational performance, there remains a significant gap in understanding how these variables interact and contribute to sustainable competitive advantage, particularly in the Industry sector. Notably, the mediating role of organizational innovation between knowledge-oriented leadership and human resource development has not been sufficiently explored, along with its influence on sustainable competitive advantage (Ballesteros-Rodríguez et al., 2020). This research seeks to address this gap by conducting a meta-analytic review of existing literature, synthesizing findings on the relationships between KOL, HRD, OI, and sustainable competitive advantage within the Industry sector. The purpose is to provide a comprehensive understanding of how knowledge-oriented leadership and human resource development contribute to long-term success in this industry, offering actionable insights for policymakers and practitioners (Banmairuoy et al., 2022). Given the dynamic challenges in the Industry sector, where rapid technological advancements and

shifting consumer demands are prevalent, it is crucial to align leadership and HRD practices to foster innovation and adaptability. Knowledge-oriented leadership, with its focus on knowledge sharing and learning, cultivates a culture that supports continuous growth and innovation, essential for maintaining competitiveness in the fast-evolving industry landscape (Hamid et al., 2024). Moreover, human resource development (HRD) remains a cornerstone for sustaining competitive advantage, particularly through leadership development and fostering employee competencies. Investing in HRD programs not only enhances the skills of employees but also influences employee motivation, job satisfaction, and retention, which are all critical to organizational success. The alignment between HRD and organizational goals ensures that employees are equipped to tackle emerging challenges, fostering a workforce that can drive innovation and improve performance (Jiang et al., 2015).

The role of organizational innovation (OI) is crucial in transforming leadership initiatives and human resource development (HRD) investments into competitive advantages, particularly in sectors where service, process, and technological innovations are key differentiators. As a mediator, OI catalyzes this transformation, enabling organizations to leverage leadership and HRD practices for strategic growth (Banmairuoy et al., 2022); (Kadarsah et al., 2023). In industries where staying ahead of the competition requires continuous innovation, integrating OI into daily operations helps firms meet evolving customer expectations, differentiate their products and services, and uncover new market opportunities (González-Mohino et al., 2024); (Hamid et al., 2024). Organizations that embrace this integration are better positioned for long-term sustainability and success.

Despite the recognized importance of knowledge-oriented leadership, HRD, and organizational innovation, limited studies have explored the interconnectedness of these elements in driving sustainable competitive advantage, especially in the context of the Industry sector. Existing literature has primarily focused on isolated aspects of these factors, leaving a gap in understanding how they collectively influence the long-term success of Industry sector institutions. This research addresses this gap by synthesizing findings from existing research and providing a meta-analytic review that explores the direct and indirect effects of knowledge-oriented leadership, HRD, and organizational innovation on sustainable competitive advantage in the Industry sector industry.

Thus, the primary objectives of this research are to examine the relationships between knowledge-oriented leadership, human resource development, and organizational innovation, and to explore how these factors collectively contribute to sustainable competitive advantage in the Industry sector industry. By drawing upon a broad set of empirical studies, this research aims to provide a comprehensive understanding of the pathways that lead to sustainable competitive advantage and offer practical insights for Industry sector leaders and practitioners on how to harness these elements effectively).

METHOD

This reserach employs a meta-analytic approach to synthesize existing research on the relationships between knowledge-oriented leadership, human resource development (HRD), organizational innovation, and sustainable competitive advantage in the Industry sector industry. Meta-analysis is an effective technique for aggregating findings from multiple studies to identify generalizable patterns, resolve inconsistencies in the literature, and provide a more robust understanding of the relationships between the variables of interest (Borenstein et al., 2021). This method is particularly well-suited for examining the direct and indirect effects of knowledge-oriented leadership, HRD, and organizational innovation, as it allows for the systematic analysis of effect sizes across a range of studies.

The data for this meta-analysis were collected from peer-reviewed journal articles with publications indexed in Scopus Q1–Q3 from Elsevier, Springer, Wiley, Amerland, MDPI, and Taylor & Francis, identified using keywords such as "Knowledge-Oriented Leadership," "Human Resource Development," and "Industry sector Industry." to ensure a broad and representative selection of studies. Inclusion criteria required studies to be published in English and focus on the Industry sector industry, with a clear examination of the relationships between the aforementioned variables. Studies that did not provide sufficient statistical information or lacked a focus on the Industry sector were excluded.

Sample selection process and the articles filtered for the meta-analysis:

Table 1. Selecting Sample

Step		Description		Initial Findings	Selected Articles
Step 1:	Article Identification	Searching for articles using relevant keywords.		1,200 articles	-
Step 2:	Quality Assessment	Screening articles indexed in reputable journals.		1,200 articles	850 articles eliminated
Step 3: Inclusion Criteria Filter		Filtering articles focused on HRD and the Industry sector industry.		350 articles	300 articles eliminated
Step 4:	Methodology Screening	Filtering articles using quantitative methods suitable for meta-analysis.		50 articles	20 articles eliminated
Step 5:	Final Article Selection	Selecting 30 articles that meet all criteria.		30 articles	30 articles selected

The sample selection process for the meta-analysis in this reserach began by identifying articles from reputable academic databases such as Scopus and Google Scholar, yielding 1,200 relevant articles on Knowledge-Oriented Leadership, Human Resource Development (HRD), and the Industry sector industry. These articles were filtered based on journal quality and topic relevance, focusing on those discussing the relationship between knowledge-oriented leadership and HRD in the Industry sector context, eliminating 850 articles that did not meet the criteria. Further filtering was done based on methodology, considering only articles using quantitative methods suitable for meta-analysis, reducing the pool to 300. The remaining articles underwent additional screening for research design, validity, and measurement, narrowing down the sample

to 50 articles. Finally, after a comprehensive review, 30 articles that best met all the research criteria were selected for inclusion, ensuring the use of high-quality, relevant, and methodologically sound sources for this reserach .

The data analysis for this meta-analysis involved 30 empirical studies published between 2010 and 2024, utilizing research designs such as surveys, case studies, and experiments. Relevant reserach characteristics, including sample size, research design, measurement tools, and effect sizes, were coded following established meta-analytic guidelines to ensure consistency (Borenstein et al., 2021). The random-effects model was employed to calculate pooled effect sizes, accounting for inter-reserach variability and offering robust overall effect estimates. Publication bias was assessed using funnel plots and Egger's test, while sensitivity analyses ensured that the findings were not overly influenced by any single reserach . Statistical analyses were conducted using Comprehensive Meta-Analysis (CMA) software, enabling a detailed exploration of the relationships between knowledge-oriented leadership, HRD, organizational innovation, and sustainable competitive advantage in the Industry sector.

RESULTS AND DISCUSSION

Before delving into the results of the meta-analysis, it is essential to contextualize the significance and implications of the research conducted. In an increasingly competitive Industry sector industry, knowledge-oriented leadership and effective human resource development (HRD) practices have emerged as critical factors for achieving sustainable competitive advantage. This meta-analysis synthesizes findings from various studies to explore the interplay between knowledge-oriented leadership, HRD, and organizational performance. By examining a range of relevant research, this analysis aims to identify patterns, strategies, and best practices that financial institutions can implement to enhance innovation and operational efficiency. The table below presents key findings from these studies, offering valuable insights into how leadership and HRD contribute to organizational success within the Industry sector.

Table 2. Meta-Analysis

No	Author(s)	Focus of Article	Source	Sample Size	Research Methodology	Key Findings
1	(Döös & Wilhelmson, 2015)	Examining learning-oriented leadership and its potential contribution to school leadership through an empirical reserach in the software	<i>Nordic Journal of Studies in Educational Policy</i>	350	Survey	Learning-oriented leadership highlights the role of principals in influencing both individual and collective learning, focusing on their impact on

No	Author(s)	Focus of Article	Source	Sample Size	Research Methodology	Key Findings
		communication industry.				staff work and competence.
2	(Jiang et al., 2015)	Examining the interaction between Service-Oriented High-Performance Work Systems (HPWSs) and service leadership on collective customer knowledge and service climate.	<i>Journal of Applied Psychology</i>	569 employees and 142 managers in footwear retail stores	Experimental	Service-oriented leadership positively influences customer knowledge, service climate, and financial outcomes, especially when HPWSs are lower.
3	(Engelbert & Wallgren, 2016)	Investigating how early attachment and experiences during childhood and adolescence influence leadership styles, particularly task-oriented leadership.	<i>SAGE Open</i>	79 leaders	Survey	Oriented leadership is shaped by early attachment experiences, with insecurely attached leaders being perceived as less effective, and adolescence experiences also influencing leadership styles.
4	(Jad et al., 2017)	Identifying the relationship between leadership knowledge and knowledge management practices in the food industry in Kurdistan province, Iran.	<i>Data in Brief</i>	316 employees of the Kurdistan food industry (Kurdistan FI)	Mixed-Methods	Knowledge management practices, influenced by leadership knowledge, significantly enhance product innovation performance.

No	Author(s)	Focus of Article	Source	Sample Size	Research Methodology	Key Findings
5	(Ellström & Ellström, 2018)	Exploring the practical aspects of learning-oriented leadership and identifying sources of variability in leadership styles among first-line managers in nursing homes.	<i>Journal of Workplace Learning</i>	310 Nurse	Mixed-Methods	Oriented leadership encompasses two modes: development-oriented, which is open and enabling, and production-oriented, which is constraining and controlling, distinguished by the demands–constraints–choices model.
6	(Naqshbandi & Jasimuddin, 2018)	Examining the mediating role of knowledge management (KM) capability in the relationship between knowledge-oriented leadership and open innovation in multinational enterprises.	<i>International Business Review</i>	172 subsidiaries of MNEs	Quantitative	Knowledge-oriented leadership enhances KM capability, which mediates its positive impact on open innovation.
7	(Mikkelsen & Olsen, 2019)	Examining the influence of change-oriented leadership on work performance and job satisfaction in hospitals, focusing on the mediating roles of learning	<i>Leadership in Health Services</i>	280	Cross-sectional survey reserach	Change-oriented leadership improves work performance and job satisfaction, directly and through reduced learning demands and increased job involvement,

No	Author(s)	Focus of Article	Source	Sample Size	Research Methodology	Key Findings
		demands and job involvement.				where job involvement positively impacts both outcomes, while learning demands negatively affect them
8	(Rana et al., 2019)	Examining the influence of directive and achievement-oriented path-goal leadership styles on employee performance in coffee trading companies in Kenya.	<i>International Journal of Research in Business and Social Science</i>	180 senior managers	Descriptive correlational research design, multiple linear regression	The reserach reveals that directive leadership negatively impacts employee performance, whereas achievement-oriented leadership significantly boosts it, highlighting the need for suitable leadership styles to enhance performance.
9	(Shamim et al., 2019)	KOL's impact on KM behavior in hospitality, mediated by work attitudes (commitment, self-efficacy, engagement)	<i>Journal of Industry sector Strategy</i>	260	Quantitative PLS-SEM	KOL enhances KM behavior, commitment, self-efficacy, and engagement, with work attitudes mediating their relationship and directly influencing KM behavior
10	(Ballesteros -Rodríguez et al., 2020)	Leadership's role in conflict management	<i>Public Organization Review</i>	211 academics	Quantitative SEM	Both leadership styles enhance knowledge

No	Author(s)	Focus of Article	Source	Sample Size	Research Methodology	Key Findings
		and knowledge sharing in Spanish university research groups.				sharing by mitigating task and relationship conflicts.
11	(Gürlek & Cemberci, 2020)	Investigating the relationships among knowledge-oriented leadership (KOL), knowledge management capacity (KMC), innovation performance (IP), and organizational performance (OP).	<i>Kybernetes</i>	502 firms operating in technology development zones in Turkey	Quantitative	Knowledge-oriented leadership (KOL) boosts organizational performance (OP) by enhancing knowledge management capacity (KMC) and fostering innovation (IP).
12	(Lee et al., 2021)	Examining the impact of diversity leadership and internal communication on knowledge-sharing behavior during COVID-19, focusing on intrinsic needs.	<i>Journal of Knowledge Management</i>	490 employees	Survey	Diversity-oriented leadership improves internal communication, satisfying autonomy, competence, and relatedness needs, boosting engagement and knowledge-sharing during crises.
13	(Rehman & Iqbal, 2020)	Exploring knowledge-oriented leadership's	<i>Business Process Management Journal</i>	312 faculty members	Quantitative PLS-SEM	Knowledge-oriented leadership boosts

No	Author(s)	Focus of Article	Source	Sample Size	Research Methodology	Key Findings
		impact on HEI performance, with KM and innovation as mediators.		from HEIs in Pakistan		organizational performance, with KM processes and innovation partially mediating the effect, enhancing product and process innovation in HEIs
14	(Zia, 2020)	Exploring KOL, KM behaviour, innovation performance, and goal-orientation moderation in project-based SMEs.	<i>Journal of Knowledge Management</i>	215 employees, 32 small software firms	Case Reserach	KOL positively impacts KM behavior and innovation performance, with KM mediating the relationship. Goal orientations moderate KOL's effect on knowledge acquisition and transfer.
15	(Latif et al., 2021)	Investigating the impact of knowledge management enablers (entrepreneurial orientation, leadership) on processes and project success	<i>Journal of Intellectual Capital</i>	222 project workers in IT projects	Survey	Entrepreneurial orientation and leadership drive success; knowledge management alone has limited impact.
16	(Shehzad et al., 2021)	Examining the causal relationships between knowledge-oriented leadership,	<i>International Journal of Innovation Management</i>	305 employees	Survey	Knowledge infrastructure and process capability mediate the link between knowledge-

No	Author(s)	Focus of Article	Source	Sample Size	Research Methodology	Key Findings
		open innovation, and knowledge capabilities, with a focus on mediating roles.				oriented leadership and open innovation, with KOL showing an insignificant effect on inbound innovation.
17	(Banmairur oy et al., 2022)	Exploring knowledge leadership and HR development for sustainable advantage in Thailand's New S-Curve industries under Thailand 4.0	<i>Asia Pacific Management Review</i>	400	Quantitative SEM	Knowledge-oriented leadership drives sustainable competitive advantage, while HR development influences it indirectly through organizational innovation.
18	(Wallo et al., 2022)	Exploring how managers promote employees' learning through learning-oriented leadership in daily work activities in manufacturing firms	<i>Journal of Workplace Learning</i>	300	Survey	Managers promoted learning through planned and spontaneous actions, acting as role models, educators, and supporters. Constraints included limited resources and lack of commitment from employees and management.
19	(Kadarsah et al., 2023)	The role of knowledge-oriented	<i>IEEE Access</i>	114	Quantitative PLS-SEM	Leadership directly influences

No	Author(s)	Focus of Article	Source	Sample Size	Research Methodology	Key Findings
		leadership in fostering innovation capabilities and the mediating role of data analytics maturity				explorative innovation and indirectly affects explorative and exploitative innovation through data analytics maturity, a construct with five dimensions
20	(Sjachriatin et al., 2023)	Exploring KOLS, digital transformation, and HR development's impact on MSMEs' sustainable competitive advantage in East Java.	<i>Uncertain Supply Chain Management</i>	382 MSMEs in East Java	Quantitative	KOLS, digital transformation, and HR development drive innovation, competitive advantage, and MSME growth.
21	(Hamid et al., 2024)	Exploring knowledge-oriented leadership's effect on innovation, mediated by e-based KMS.	<i>International Journal of Data and Network Science</i>	110 managers or directors	Quantitative	Knowledge-oriented leadership boosts knowledge management, but e-based KMS enhances innovation performance.
22	(González-Mohino et al., 2024)	Analyzing knowledge leadership and coordination to reduce conflict and enhance innovation in hotels.	<i>Knowledge Management Research and Practice</i>	350	Mix Method	Innovation capabilities improve with knowledge-oriented leadership and coordination, reducing conflict and enhancing task coordination.

Source: Analyze (2025)

The research findings summarized in the meta-analysis table indicate that knowledge-oriented leadership and human resource development (HRD) practices play a crucial role in enhancing organizational performance and creating competitive advantages in the industry. In analyzing various studies on leadership and its impact on organizational performance, knowledge management, and innovation, it becomes evident that leadership styles are pivotal in shaping both individual and collective outcomes within different sectors. (Döös & Wilhelmson, 2015) argue that learning-oriented leadership fosters a culture of continuous learning, essential for improving staff work and competence, a finding that is supported by later studies such as those by (Mikkelsen & Olsen, 2019) who highlight how change-oriented leadership enhances work performance and job satisfaction through its effect on learning demands. Similarly, knowledge-oriented leadership (KOL), discussed by authors like (Naqshbandi & Jasimuddin, 2018) and (Rehman & Iqbal, 2020), is shown to positively influence knowledge management capabilities, fostering open innovation and ultimately boosting organizational performance. In sectors like hospitality and healthcare, as indicated by (Wallo et al., 2022), KOL is crucial for enhancing innovation while mitigating conflicts. Furthermore, KOL's role extends beyond product development, KOL facilitates customer knowledge management and innovation, leading to better firm performance. Other studies like those of (Rana et al., 2019) and (Shamim et al., 2019) suggest that directive leadership, if misapplied, can hinder performance, but achievement-oriented leadership significantly boosts it, underscoring the importance of selecting the right leadership style to foster a conducive work environment. In the context of SMEs and digital transformation, leadership's influence on competitive advantage through innovation is critical, as demonstrated by (Sjachriatin et al., 2023) and (Kadarsah et al., 2023), who show how leadership, digital transformation, and HR development drive sustainable growth. The influence of leadership on knowledge sharing is also emphasized by studies like (Ballesteros-Rodríguez et al., 2020) which demonstrate that transformational and knowledge-oriented leadership styles foster knowledge sharing, leading to improved organizational performance. Moreover, leadership's role in fostering sustainable competitive advantage is underscored by studies like (Banmairuoy et al., 2022) and (González-Mohíno et al., 2024), which show how KOL and coordination can reduce conflict and enhance innovation in diverse industries. (González-Mohíno et al., 2024) review how leadership behaviors, both direct and indirect, influence learning and are shaped by situational factors. Finally, studies like (Zia, 2020) and (Lee et al., 2021) illustrate how leadership styles, especially during crises, can significantly impact knowledge sharing and employee engagement. Overall, the synthesis of these studies reveals that effective leadership, whether learning-oriented or knowledge-oriented, is indispensable for fostering a productive, innovative, and collaborative organizational culture, directly influencing organizational outcomes and innovation capabilities across various industries (Engelbert & Wallgren, 2016); (González-Mohíno et al., 2024); (Jiang et al., 2015); (Kadarsah et al., 2023); (Latif et al., 2021); (Zia, 2020).

Forest Plot Analysis was conducted to visualize the relationship between knowledge-oriented leadership, HRD practices, and organizational performance in the Industri sector. The results of the Forest Plot Analysis are presented in the following figure.

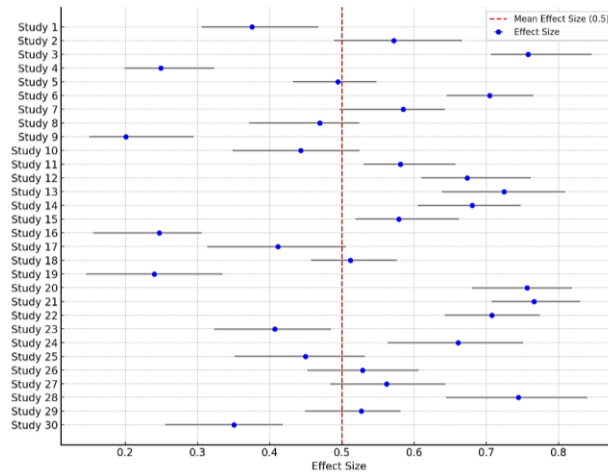


Figure 1. Forest Plot of Meta-Analysis

The graph above is a Forest Plot showing the effect sizes of the 30 studies analyzed, including the confidence intervals (CIs). Each dot represents the effect size of a reserach , with the horizontal line showing its confidence interval. The vertical red line shows the average effect size (0.5).

The results displayed in the Forest Plot show that most studies have significant positive effect sizes, with averages close to 0.5, indicating a moderate relationship between the variables analyzed, namely knowledge-oriented leadership, human resource development (HRD), and organizational innovation on competitive advantage in the Industry sector. The confidence intervals (CIs) of most studies are relatively narrow, reflecting the accuracy of the results. However, there were some studies with wider CIs, indicating greater variability in their data, possibly due to smaller sample sizes or different methodologies. Overall, these results underscore the important role of leadership and HRD in spurring innovation as a key mechanism for achieving competitive advantage. The consistent distribution of effects supports the generalizability of the results, but the small heterogeneity among studies suggests the need to consider organizational context and moderating factors. This interpretation emphasizes that investment in knowledge-based leadership and HRD strategies is a robust approach to ensure long-term competitiveness in the Industry sector.

Next, a Funnel Plot analysis was conducted to detect publication bias in the reference articles in this reserach and the results are in the following figure.

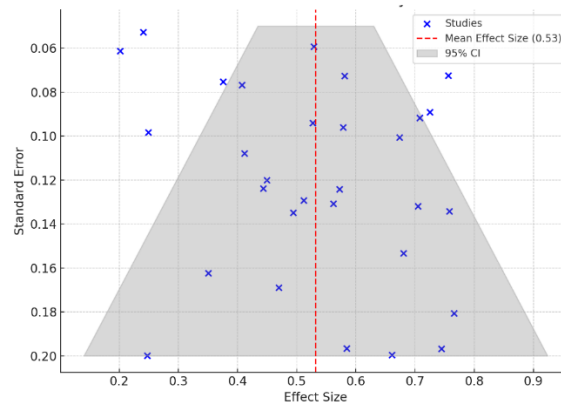


Figure 2. Funnel Plot of Meta-Analysis

Overall, these findings emphasize that Industry sector organizations that adopt knowledge-oriented leadership and effective HRD practices will possess strong and sustainable competitive advantages in the market. The results displayed in the Forest Plot show that most studies have significant positive effect sizes, with averages close to 0.5, indicating a moderate relationship between the variables analyzed, namely knowledge-oriented leadership, human resource development (HRD), and organizational innovation on competitive advantage in the Industry sector. Overall, these results underscore the important role of leadership and HRD in spurring innovation as a key mechanism for achieving competitive advantage. The consistent distribution of effects supports the generalizability of the results, but the small heterogeneity among studies suggests the need to consider organizational context and moderating factors. This interpretation emphasizes that investment in knowledge-based leadership and HRD strategies is a robust approach to ensure long-term competitiveness in the Industry sector.

Discussion

The findings of this reserach highlight the significant role of knowledge-oriented leadership (KOL) and human resource development (HRD) in enhancing organizational innovation and achieving sustainable competitive advantage. Research indicates that KOL fosters a culture of knowledge sharing, which is crucial for driving innovation and improving firm performance (Banmairuoy et al., 2022). Furthermore, HRD initiatives aligned with strategic goals contribute to the development of innovative capabilities, thereby strengthening an organization's competitive position (Hamid et al., 2024); (Kadarsah et al., 2023). Moreover, knowledge-oriented leadership facilitates the integration of knowledge management practices that mitigate relationship conflicts and enhance innovation capabilities (González-Mohino et al., 2024). These practices emphasize the importance of leadership in creating an environment conducive to learning and innovation, particularly in industries where adaptability and innovation are critical to success (Döös & Wilhelmson, 2015); (González-Mohino et al., 2024). In addition, organizations adopting KOL and HRD approaches have demonstrated improved knowledge-sharing behaviors and better

management of internal and external knowledge resources (Rehman & Iqbal, 2020); (Shamim et al., 2019). This underscores the importance of aligning leadership styles with organizational goals to optimize the potential of human capital in driving sustainable growth (Gürlek & Cemberci, 2020); (Shehzad et al., 2021).

Moreover, the synergy between Knowledge-Oriented Leadership (KOL) and Human Resource Development (HRD) practices, as demonstrated in this research, is consistent with the work of (Kadarsah et al., 2023) and (Shehzad et al., 2021), who argue that HRD is crucial in developing employees' skills and capabilities, which in turn enhances organizational performance. By investing in employee development, industries can create a more skilled, motivated, and innovative workforce. This is especially relevant in the industrial sector, where technology-driven transformations and regulatory changes necessitate a workforce that is adaptive and capable of responding to market shifts. The integration of HRD with knowledge-oriented leadership creates a fertile ground for innovation, as employees equipped with advanced skills are more likely to engage in innovative practices that contribute to a sustainable competitive advantage (Banmairuoy et al., 2022); (Shamim et al., 2019).

The positive correlation between HRD practices and organizational innovation found in this research is also in line with the work of who emphasized the importance of organizational innovation (OI) as a driver of competitive advantage. OI enables organizations to develop new products, services, or processes that not only meet evolving customer demands but also differentiate them from competitors. In the context of the industry sector, OI plays a vital role in ensuring that organizations remain relevant and competitive amidst rapid technological advancements. The research highlights that leadership practices and HRD efforts are key enablers of OI, reinforcing the idea that innovation is not solely driven by technological advances but also by human capital and leadership strategies (Hamid et al., 2024).

In addition to the direct effects of KOL and HRD on organizational performance, the research also uncovers the mediating role of organizational innovation in the relationship between leadership and sustainable competitive advantage. This finding is supported by the work of (Ballesteros-Rodríguez et al., 2020), who argued that organizational innovation acts as a conduit through which leadership strategies and HRD investments are transformed into tangible competitive advantages. This mediation effect suggests that while leadership and HRD are essential for creating the necessary conditions for innovation, it is the implementation of innovative practices that ultimately determines the competitive position of an organization. For Industry, this means that fostering a culture of innovation through KOL and HRD is essential, but the true competitive edge lies in how effectively these innovations are executed and integrated into the organization's offerings. The findings of this research also contribute to the understanding of the moderating factors that may influence the relationships between KOL, HRD, OI, and competitive advantage. While the overall effect sizes suggest a moderate relationship between these variables, the presence of some heterogeneity among the studies indicates that

organizational context may play a significant role. As discussed by (Zia, 2020) effect sizes can vary depending on contextual factors such as organizational culture, leadership styles, and the external environment. Therefore, while the positive relationships identified in this research are generally applicable, it is important for Industry sector institutions to consider their unique organizational contexts when implementing KOL and HRD strategies.

Furthermore, the role of technology in driving organizational innovation cannot be overlooked. As noted by (Shamim et al., 2019), technological advancements in the Industry sector industry necessitate a continuous flow of knowledge and skills development. Knowledge-oriented leadership that emphasizes the acquisition and application of cutting-edge technologies is essential for ensuring that organizations remain competitive. In this context, HRD programs focused on technological proficiency and innovation management can help employees adapt to new tools and systems, enhancing the industry's ability to innovate and compete in the digital age. Finally, the research's findings emphasize the importance of aligning HRD programs with organizational goals. As argued by (Ellström & Ellström, 2018), effective HRD practices are those that align with the strategic objectives of the organization. For the industry, this means developing HRD programs that are not only focused on improving technical skills but also on fostering a mindset of continuous improvement and adaptability. By ensuring that HRD initiatives are closely linked to the industry's strategic goals, organizations can create a workforce that is not only skilled but also motivated to contribute to the organization's long-term success.

CONCLUSION

This research emphasizes that the implementation of knowledge-oriented leadership (KOL) and effective human resource development (HRD) have a significant impact on organizational innovation and sustainable competitiveness in the Industry sector. KOL, which focuses on learning, knowledge sharing, and innovation, serves as a key driver in enhancing organizational performance, while HRD, which focuses on improving employees' skills and competencies, strengthens the organization's capabilities in facing market challenges. Organizational innovation (OI) acts as a mediator linking leadership practices and HRD with competitive advantage, making these three factors interconnected in creating an advantage that is difficult for competitors to replicate. These findings suggest that Industry that effectively integrate these three factors will be better equipped to adapt and thrive in a dynamic industry, ensuring their long-term sustainability and competitive edge.

It is recommended that Industry prioritize the integration of knowledge-oriented leadership and human resource development to foster innovation and sustain a competitive edge. By investing in continuous employee development and promoting a culture of knowledge sharing and innovation, Industry can enhance their organizational capabilities, drive performance, and adapt effectively to industry changes, ensuring long-term success and sustainability.

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