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**Enhancing HR Efficiency through Supply Chain Management Techniques in  
Educational Institutes**



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## **Abstract**

This research delves into the intricate relationship between Supply Chain Management (SCM) practices and Human Resources (HR) Efficiency within the unique context of private universities situated in Rawalpindi and Islamabad, Pakistan. Using quantitative research methodology, data was meticulously gathered from teaching faculty members through structured questionnaires, providing a comprehensive understanding of the topic. The study meticulously scrutinized four pivotal SCM variables—Efficient Procurement, Optimization of Operations, Vendor Relationship, and Planning & Forecasting—and their direct impacts on HR Efficiency. The results revealed compelling and statistically significant positive correlations between these SCM variables and HR Efficiency, underscoring the pivotal role of efficient procurement processes, streamlined operational optimization, strong vendor relationships, and strategic planning and forecasting in bolstering HR operations within educational institutes. These findings offer valuable insights for educational leaders and HR practitioners seeking to optimize organizational effectiveness through the integration of SCM principles into HR management strategies. However, it's essential to acknowledge the inherent limitations of the study, such as sample size constraints and potential biases associated with data collection methods, which may temper the generalizability of the findings. Therefore, this study also paves the way for future research endeavors, suggesting avenues for further exploration to deepen our understanding of the multifaceted interplay between SCM and HR practices within educational institutes, ultimately facilitating informed decision-making and organizational improvement.

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# **Chapter 1**

## **Introduction**

### **Chapter Overview**

This chapter explores the application of supply chain management (SCM) techniques to enhance human resource (HR) efficiency in educational institutes. The introduction highlights the potential benefits of integrating SCM strategies into HR management, such as streamlining processes, reducing costs, and improving employee productivity, which ultimately leads to better institutional performance. The chapter provides an overview of existing research, which underscores the benefits of SCM practices in corporate settings but points out the gap in literature regarding their application in educational environments. Key research areas include the impact of efficient procurement, optimization of operations, vendor relationships, planning and forecasting, and technological implementations on HR efficiency. The chapter presents the research gap, emphasizing the need for empirical studies to explore SCM's influence on HR in educational institutes. It also defines the research problem and objectives, aiming to investigate the impact of SCM practices on HR processes. Finally, the research significance section discusses how applying SCM techniques to HR functions can lead to cost savings, improved workforce planning, higher employee satisfaction, and a more strategic approach to managing human resources, contributing to overall institutional success and sustainability.

### **1.1 Introduction**

In today's competitive educational landscape, educational institutes face increasing pressure to enhance efficiency and optimize resource allocation while maintaining high-quality education standards. Implementing supply chain management (SCM) techniques in human resource (HR) management can play a pivotal role in achieving these goals. By applying SCM strategies, educational institutes can streamline HR processes, reduce costs, and improve employee productivity, ultimately leading to improved overall institutional performance.

The existing literature on the impact of SCM techniques in educational institutes highlights several key areas of interest in this field. Studies on supply chain management in educational settings have demonstrated the potential benefits of implementing SCM practices in various aspects of institutional operations. For instance, optimizing inventory control and procurement

strategies can lead to more efficient use of resources and cost savings. Research by Boon-itt and Paul (2018) discusses how SCM can streamline resource allocation and improve financial management within educational institutions. Furthermore, logistics optimization helps streamline the movement of goods and services within the institute, ensuring that resources are available when and where they are needed. Effective supplier relationship management can improve the quality and reliability of supplies and services, contributing to overall operational efficiency (Zsidisin & Wagner, 2018). This is particularly important in educational settings where reliable access to teaching materials and other supplies can directly impact the quality of education provided (Gonzalez-Padron et al., 2019).

In terms of enhancing HR efficiency, the literature explores how SCM techniques can be applied to HR processes such as recruitment, onboarding, training, and employee scheduling. By using SCM practices, educational institutes can make more data-driven decisions regarding workforce planning and staffing needs (Waller & Fawcett, 2019). This can lead to better alignment between employee skills and job requirements, ultimately improving productivity and employee satisfaction. Moreover, research suggests that integrating SCM techniques into HR operations can lead to more strategic workforce planning, allowing educational institutes to anticipate future staffing needs and respond effectively to changing circumstances such as fluctuations in enrollment (Prajogo et al., 2018). This integration can also enhance transparency and accountability in HR processes, fostering trust among employees and stakeholders (Wong et al., 2020).

Despite the potential advantages, the literature reveals a gap in understanding the practical application of SCM practices to HR management in educational institutes. Most existing studies focus on traditional SCM applications in corporate settings, leaving educational environments relatively understudied. There is a need for more empirical, data-driven research to establish the effectiveness of SCM techniques in enhancing HR efficiency in educational institutes (Chopra & Sodhi, 2020). For instance, Leung et al. (2020) emphasize the importance of applying SCM practices in higher education institutions to streamline academic scheduling and improve operational efficiency. Yuen and Thai (2018) discuss the potential benefits of SCM practices in managing faculty workload and optimizing course scheduling. By exploring the impact of SCM



on HR efficiency in educational institutes, this research can provide valuable insights into how these practices can be integrated to improve HR processes and overall institutional performance. This, in turn, can contribute to a more efficient, data-driven, and employee-centric approach within educational settings.

## **1.2 Background Study**

The intersection of Human Resource Management (HRM) and Supply Chain Management (SCM) has gained attention in recent years due to the potential for HRM to support and enhance SCM processes. Despite this growing interest, research on the combination of HRM and SCM (HRSC) remains relatively limited. This literature review aims to highlight existing research on HRSC, identify key contributions, and underline the potential benefits of studying this emerging field. A literature review conducted by Giunipero et al. (2008) examined SCM research trends from 1996 to 2006, revealing a strong emphasis on specific themes while neglecting others, such as HRM, which was targeted in only 2% of SCM studies. This gap indicates the need for further research on HRSC to understand the role of HRM in SCM processes. Tracey (2005) suggests that the synchronization of the supply chain relies heavily on individuals' involvement, as human judgment and flexibility are essential components for achieving competitive advantages in supply chain processes.

Scarbrough (2000) notes that the supply chain creates a significant demand for HRM to acquire necessary skills and flexible behaviors for better integration. This statement suggests that HRM can play a key role in supporting and operationalizing responsibilities and relationships within the supply chain (Lengnick-Hall & Lengnick-Hall, 2013). For instance, Menon (2012) identifies that specific HRM practices, such as flexible job descriptions, team organization, teamwork training, and performance indicators, significantly correlate with supply chain performance. Smith-Doerflein et al. (2011) highlight that individuals engage in activities and behaviors they are rewarded and motivated by, leading to fair compensation and benefits. These individuals cooperate with all company employees and external parties such as suppliers and customers and actively engage in processes and products that enhance the supply chain's operational efficiency, responsiveness to customers, product quality, and competitive pricing (Chen & Paulraj, 2004;

Pagell, 2004). Furthermore, Ou et al. (2010) emphasizes that successful SCM programs require employee understanding of SCM philosophy and principles.

Among the empirical studies, surveys were commonly used to study the causal relationship between HRM practices and SCM performance. Gowen and Tallon (2003) and Smith-Doerflein et al. (2011) have conducted empirical studies based on surveys that highlight the impact of HRM on SCM performance. Their findings suggest that HRM interventions can lead to beneficial outcomes for supply chain processes. For instance, selecting competent employees fosters an effective supply chain through the recruitment and retention of capable workers adaptable to dynamic, customer-oriented environments (Dischinger et al., 2006). Moreover, McCarter et al. (2005) argued that education and training on supply chain concepts provide employees with a vision and understanding of SCM, leading to profitable outcomes. Cultural compatibility, as mentioned by McCarter et al. (2005), should also be considered because it can directly and indirectly impact supply chain performance. Delaney and Huselid (1996) identified a positive correlation between HRM practices and performance measures, supporting the importance of HRM in supply chain success.

Vanichchinchai and Igel (2021) found that individual workers' effective participation improves supply chain performance, suggesting the importance of HRM practices that enhance employee engagement, motivation, and adaptability. Similarly, Shub and Stonebraker (2009) emphasize the significance of employee engagement, work motivation, and shared norms in contributing to supply chain success. The research suggests that aligning HRM practices with SCM can lead to improved operational efficiency, responsiveness to customer demands, and overall supply chain performance. The limited research in the combined field of HRM and SCM indicates that there is substantial room for further exploration and investigation.

### **1.3 Research Gap:**

The potential for supply chain management (SCM) techniques to enhance human resource (HR) efficiency in universities and educational institutes is promising. However, the body of research on this topic remains limited, as most studies have focused on SCM practices within corporate environments, leaving educational settings understudied. This gap in the literature points to the

need for further empirical research on the impact of SCM techniques on HR efficiency within educational institutions.

In terms of vendor relationships, corporate research has provided insights into managing vendor partnerships and their effects on operational efficiency. However, the specific impact of strong vendor relationships on HR efficiency within educational settings remains largely unexplored. This underexplored area requires additional research to understand how long-term partnerships and strategic vendor management affect HR outcomes, including employee satisfaction and productivity (Carter et al., 2018). Research on planning and forecasting primarily concentrates on corporate settings and manufacturing sectors, with a focus on the use of data analytics and forecasting models to improve operations. There is limited research on the specific impact of these techniques on HR efficiency within educational institutes. Future research could explore how strategic planning and data-driven decision-making optimize HR operations in educational settings (Dey & Choudhury, 2019).

Overall, a gap exists in the literature regarding the application of SCM techniques across different aspects of educational institutes, such as vendor relationships, planning and forecasting, and technological implementations. Further research is essential to establish how these techniques can enhance HR efficiency and contribute to overall institutional performance. Studies should focus on educational settings to provide a comprehensive understanding of the impact of SCM practices on HR outcomes (Jones & Reynolds, 2018). Additionally, most existing research utilizes qualitative case studies or conceptual frameworks, highlighting the need for more quantitative, data-driven research to establish the relationship between SCM techniques and performance metrics in educational institutes (Barua, 2019).

For instance, a study examined the role of supply chain for human resource efficiency within a university setting but did not extend its scope to encompass broader educational settings or other SCM techniques. Similarly, procurement practices in higher education lacked a comprehensive approach to other SCM aspects such as logistics and supplier relationship management. These gaps in the literature indicate the need for more holistic research on the impact of SCM techniques on educational institutes, including various educational settings and geographic regions.

## **1.4 Problem Statement**

The management of human resources is a critical component of any educational institute's success. However, many institutes struggle with HR inefficiencies that can impact employee satisfaction, productivity, and overall performance. These inefficiencies may stem from outdated HR processes, lack of data-driven decision-making, and challenges in workforce planning and management. The integration of supply chain management (SCM) techniques into HR operations presents a potential solution to these challenges. SCM practices offer structured approaches to optimizing resource allocation, improving process efficiency, and enhancing data analytics for strategic decision-making. Despite the potential benefits, there is limited research on how these SCM techniques can be effectively applied to HR operations in educational institutes.

The lack of knowledge in this area represents a significant gap in the literature, as the application of SCM practices to HR could lead to improvements in recruitment, training, and employee retention. It may also enhance transparency and accountability within HR processes, fostering a positive work environment and supporting the academic and administrative goals of the institute. The research problem, therefore, is to investigate how supply chain management techniques can enhance HR efficiency in educational institutes. This study seeks to identify specific SCM practices that can be applied to HR functions and examine their impact on operational optimization, employee satisfaction, and institutional performance. By addressing this problem, the research aims to provide educational institutes with actionable insights to improve HR management and ultimately contribute to their success and sustainability.

## **1.5 Research Questions**

1. What is the impact of Efficient Procurement on HR Efficiency?
2. What is the impact of Optimization of Operations on HR Efficiency?
3. What is the impact of Vendor Relationship on HR Efficiency?
4. What is the impact of Planning and Forecasting on HR Efficiency?

## **1.6 Research Objectives**

1. To investigate the impact of Efficient Procurement on HR Efficiency.
2. To investigate the impact of Optimization of Operations on HR Efficiency.

3. To investigate the impact of Vendor Relationship on HR Efficiency.
4. To investigate the impact of Planning and Forecasting on HR Efficiency.

### **1.7 Research Significance**

By applying supply chain management techniques to HR functions, educational institutes may experience streamlined HR processes such as recruitment, onboarding, training, and employee scheduling. This can lead to more efficient HR operations overall. SCM techniques can contribute to cost savings in HR management by identifying and eliminating inefficiencies, such as overstaffing or underutilization of resources. This can help educational institutes allocate their HR budget more effectively. Integrating SCM techniques, such as data analytics and forecasting, into HR operations allows educational institutes to make more informed decisions about workforce planning, staffing needs, and employee performance. Optimized HR processes can improve employee satisfaction by ensuring a better match between job roles and employees' skills and by providing clear career development paths. This can lead to higher retention rates and a more stable workforce.

SCM techniques support strategic workforce planning by helping educational institutes anticipate future staffing needs and align HR strategies with the organization's goals. This can contribute to a more adaptable and responsive workforce. Aligning HR operations with the supply chain can enhance the institute's ability to meet academic and administrative goals more effectively, creating a harmonious work environment that supports teaching and learning. Utilizing SCM techniques in HR can lead to greater transparency and accountability in HR processes, fostering trust and confidence among employees and stakeholders. Supply chain management techniques can help educational institutes adjust HR operations based on changing needs and circumstances, such as fluctuating enrollment or shifts in educational trends. Applying SCM techniques to HR operations encourages innovation and continuous improvement by providing a structured approach to evaluating and refining HR processes.

This research contributes to the existing body of knowledge by exploring the novel intersection between supply chain management and HR efficiency in educational institutes, providing insights that can inform future studies and best practices. In summary, the research on enhancing HR efficiency through supply chain management techniques in educational institutes has the

potential to revolutionize HR practices within these organizations, leading to a more efficient, data-driven, and employee-centric approach. By addressing these aspects, the study can provide educational institutes with valuable strategies to improve HR operations and overall institutional performance.

## **Chapter 2**

### **Literature Review**

#### **Chapter Overview**

The literature review chapter begins by providing an overview of the chapter's purpose and scope, emphasizing the importance of reviewing existing literature to establish a theoretical foundation for the research. The chapter then explores the role of supply chain strategies within the context of human resources in educational institutions in Pakistan, highlighting how effective supply chain management can influence HR practices and outcomes. The chapter examines efficient procurement practices in the education sector, focusing on strategies to improve processes and reduce costs while maintaining quality. It reviews literature on operational optimization in educational institutes, discussing approaches to streamline processes and enhance productivity through supply chain strategies. The review delves into the significance of strong vendor relationships and their impact on the supply chain within educational institutions. It also explores planning and forecasting methods for effective resource allocation and future readiness. The theoretical framework is introduced, outlining key theories and models relevant to the study. This includes a detailed overview of the Resource-Based View theory, which provides a foundation for understanding the relationships being investigated. Finally, the chapter presents the research hypotheses that emerge from the literature review, outlining the proposed relationships and expected outcomes to be tested in the research study.

#### **2.1 Introduction**

Supply chain management (SCM) principles have been applied to various domains beyond traditional supply chain processes, including human resources (HR) management in educational institutions. A growing body of research suggests that SCM techniques can enhance HR efficiency in educational settings by improving recruitment, training, and retention processes, ultimately leading to higher institutional performance. This literature review explores existing research on the intersection of SCM principles and HR efficiency in educational institutions, emphasizing the potential benefits and challenges of implementing SCM techniques in HR management.

SCM principles can be effectively applied to recruitment and selection processes to reduce time-to-hire and improve the quality of new hires. For instance, Yasin (2020) found that implementing SCM techniques in the recruitment process can streamline operations and reduce the time required to fill positions. By adopting these methods, educational institutions can enhance the overall quality of new hires, leading to downstream benefits such as improved employee engagement and productivity. Similarly, Sharma and Kumar (2019) argue that SCM techniques can be employed in training and development programs to enhance employee engagement, skill development, and retention rates. In addition to improving recruitment and selection processes, applying SCM practices to training and development can offer various benefits. Sharma and Kumar (2019) suggest that effective training and development programs, influenced by SCM techniques, can increase employee satisfaction and retention rates. Harms and Spaeth (2018) support this notion, highlighting how SCM principles can improve HR efficiency, particularly in workforce planning and management. This optimization can contribute to higher institutional performance and better outcomes for educational institutions.

Several theoretical frameworks are utilized to understand the impact of SCM techniques on HR efficiency. The Resource-Based View (RBV) theory posits that competitive advantage arises from valuable, rare, and inimitable resources (Barney, 1991). By applying SCM principles to HR processes, educational institutions can optimize their human resources as a strategic asset. SCM theory highlights the coordination and integration of processes across the supply chain to improve overall performance (Mentzer et al., 2001). Translating these principles to HR functions can create a more efficient, cohesive system within educational institutions. Human Resource Management (HRM) theories focus on the strategic management of human resources to enhance organizational effectiveness (Boxall & Purcell, 2011). Integrating SCM practices can align HRM with overall institutional goals, contributing to better outcomes. Change Management theories examine how organizations navigate transitions and implement new strategies (Kotter, 1996). These approaches can facilitate the adoption of SCM techniques in HR processes. Innovation Adoption theories explore how organizations embrace new technologies and practices (Rogers, 2003). The adoption of SCM principles in HR functions aligns with this body of research.



The literature suggests that implementing SCM techniques in HR management can offer several advantages for educational institutions. One such benefit is the reduction of time-to-hire, as SCM methods can streamline recruitment processes, enabling institutions to fill positions more efficiently (Yasin, 2020). Improved quality of new hires is another potential advantage, as effective SCM in recruitment can lead to better matches between candidates and job requirements (Haseko & Štrukelj, 2018). Enhanced employee engagement and retention are additional benefits of applying SCM techniques in HR management. SCM in training and development can increase employee satisfaction and retention rates (Sharma & Kumar, 2019). Streamlined HR processes can also optimize HR workflows, reducing administrative burdens and improving efficiency (Wang, 2019). This, in turn, can lead to improved employee productivity and overall institutional performance (Harms & Spaeth, 2018). Despite the potential benefits, implementing SCM techniques in HR management also presents challenges for educational institutions. These include resistance to change, limited resources, and the need for strategic alignment between SCM and HR practices. Educational institutions must navigate these challenges to successfully integrate SCM techniques into their HR processes and realize the full potential of these strategies.

In conclusion, the literature review establishes a solid foundation for further investigation into the role of SCM techniques in enhancing HR efficiency and institutional performance in educational institutions. By examining existing research and theories, this review highlights the potential benefits and challenges of implementing SCM practices within HR functions, paving the way for future studies in this area. Through the application of SCM principles in recruitment, training, and retention processes, educational institutions can optimize their HR practices, leading to improved outcomes for both employees and the institution.

## **2.2 Role of Supply Chain Strategies in HR of Educational Institutes in Pakistan**

The adoption of supply chain management (SCM) techniques in human resource (HR) management in educational institutes offers significant opportunities to enhance efficiency and optimize resource allocation while maintaining high-quality education standards. The literature from 2018 to 2024 provides valuable insights into the potential benefits of integrating SCM practices in various aspects of institutional operations, particularly in HR management. This

literature review synthesizes key findings from the latest research in this field, focusing on how SCM techniques can improve HR processes and overall institutional performance.

The implementation of SCM practices in educational institutes can optimize inventory control and procurement strategies, which is essential for efficient resource allocation and cost savings. Khalid and Ahmed (2019) emphasize the importance of efficient resource allocation, demonstrating that streamlining procurement and inventory can lead to financial savings and improved operational efficiency in educational institutions. By applying SCM strategies to control inventory and manage procurement, educational institutes can ensure that resources are available when and where they are needed, minimizing waste and promoting financial sustainability.

Another aspect of SCM implementation in educational institutes is logistics optimization. By streamlining the movement of goods and services within an educational institute, resources can be managed efficiently to support teaching and learning activities. Ahmad and Khan (2021) underscore the importance of effective supplier relationship management, which can improve the quality and reliability of supplies and services and thus contribute to overall operational efficiency. A stable and reliable supply chain is crucial for educational institutes to maintain high-quality educational standards and ensure the smooth functioning of institutional operations.

In terms of enhancing HR efficiency, recent literature explores the application of SCM techniques to various HR processes such as recruitment, onboarding, training, and employee scheduling. Rehman et al. (2023) suggest that data-driven approaches can help educational institutes better align employee skills with job requirements, improving productivity and employee satisfaction. By using SCM practices, educational institutes can optimize HR processes, such as workforce planning and staffing, to meet the dynamic needs of the institution.

Naeem and Ahmed (2022) discuss how SCM techniques can streamline HR processes and improve alignment between workforce supply and demand. This strategic approach can lead to better anticipation of future staffing needs and enable educational institutes to respond effectively to changing circumstances such as fluctuations in enrollment. By integrating SCM techniques into HR operations, educational institutes can optimize workforce planning, thus

improving overall institutional performance. Additionally, the integration of SCM techniques can enhance transparency and accountability in HR processes, fostering trust among employees and stakeholders. This is important for creating a positive work environment and promoting employee engagement. SCM practices can help educational institutes to establish clear lines of communication and decision-making, leading to improved organizational effectiveness and efficiency.

Despite the potential advantages, there is a gap in understanding the practical application of SCM practices to HR management in educational institutes. Most existing studies focus on traditional SCM applications in corporate settings, leaving educational environments relatively understudied (Qureshi & Ali, 2023). Future research is needed to explore the nuances of applying SCM techniques in educational contexts, considering the unique challenges and opportunities presented by educational settings. There is a need for more empirical, data-driven research to establish the effectiveness of SCM techniques in enhancing HR efficiency in educational institutes. While current studies provide valuable insights into the potential benefits of SCM practices, more rigorous and comprehensive research is required to validate these findings and guide the development of best practices for educational institutes.

Research suggests that integrating SCM techniques can lead to a more employee-centric approach, ultimately contributing to higher employee satisfaction and productivity. This can improve overall institutional performance by fostering a supportive and collaborative work environment. SCM techniques can also facilitate the development of career paths and growth opportunities for employees, aligning with their goals and aspirations. Moreover, emerging technologies such as artificial intelligence (AI) and data analytics can further enhance the application of SCM techniques in HR processes. These technologies enable educational institutes to collect and analyze vast amounts of data, providing valuable insights for decision-making and strategic planning. AI and data analytics can also streamline HR processes such as recruitment and performance evaluation, improving efficiency and accuracy.

Continued research is needed to explore the impact of emerging technologies on HR management in educational institutes. This includes investigating how AI and data analytics can be effectively integrated into existing HR processes and exploring potential ethical

considerations and challenges associated with their use. The valuable insights into the impact of SCM techniques on HR efficiency in educational institutes. By exploring how these practices can be integrated to improve HR processes and overall institutional performance, educational institutions can benefit from a more efficient, data-driven, and employee-centric approach. Future research should focus on empirical studies and technological integration to further enhance the application of SCM techniques in educational HR management. This can contribute to the development of best practices that support educational institutes in achieving their goals of providing high-quality education while optimizing resource allocation and operational efficiency.

### **2.3 Efficient Procurement**

Efficient procurement practices play a crucial role in enhancing human resource (HR) efficiency in universities and educational institutes. Integrating supply chain management (SCM) techniques within procurement can lead to cost savings, improved supplier relationships, streamlined purchasing processes, and better compliance with regulations, ultimately influencing HR efficiency. This literature review explores how applying SCM techniques to procurement impacts HR efficiency within educational settings, incorporating the latest references from recent studies.

Efficient procurement leads to cost savings through streamlined purchasing processes, better contract negotiations with suppliers, and the leveraging of economies of scale. These cost savings enable educational institutes to allocate more resources towards HR initiatives such as employee training and development, recruitment, and benefits. Zhang and Zhu (2023) emphasize that optimizing procurement practices allows educational institutions to invest more in their workforce, resulting in improved employee satisfaction and productivity. Integrating procurement processes with HR operations creates a cohesive management approach. Improved coordination between procurement and HR ensures the availability of necessary resources for employee use, such as technology and equipment, thereby enhancing productivity and job satisfaction. Mason and Thompson (2022) observe that SCM techniques offer data-driven insights that inform HR decision-making, such as identifying emerging trends and forecasted demand.

Effective supplier relationship management (SRM) within SCM leads to improved relationships with vendors, resulting in reliable and timely deliveries. These strong supplier relationships contribute positively to HR efficiency by providing quality training materials or equipment for employee development programs. Garcia and Nguyen (2023) note that collaboration between departments, such as finance, procurement, and HR, creates synergies that improve institutional operations. Automated procurement systems reduce administrative burdens, enabling HR staff to focus on strategic initiatives rather than routine tasks. This boosts HR productivity and effectiveness, allowing HR professionals to concentrate on higher-level tasks such as employee engagement and performance management. Harris and Kaur (2023) find that automated systems minimize paperwork and manual data entry, freeing up HR staff to focus on strategic aspects of their roles.

SCM techniques ensure compliance with legal and regulatory requirements in procurement, reducing risks and avoiding HR issues related to legal compliance and disputes. Educational institutes must adhere to various rules and standards when procuring goods and services, and efficient procurement helps minimize potential legal issues and disputes. Perez and Smith (2022) explore compliance challenges in educational procurement, suggesting that SCM techniques help mitigate risks. SCM practices in procurement can encourage educational institutes to adopt modern practices and technologies in HR. For instance, data analytics can predict workforce trends, and digital recruitment strategies can optimize hiring processes. The introduction of e-learning platforms for employee training fosters a culture of continuous learning and innovation. Liu and Patel (2023) discuss modern HR practices facilitated by SCM techniques in universities, highlighting their potential to enhance institutional performance.

Efficient procurement can also support sustainability and ethical practices within educational institutes. Sustainable procurement involves selecting suppliers and products that minimize environmental impact and adhere to ethical labor practices. These practices extend to HR initiatives, offering employees opportunities for community engagement and training in environmentally responsible practices. Chen et al. (2023) study the impact of sustainable procurement on educational institutions and advocate for its adoption in universities. Despite the potential benefits of SCM techniques in enhancing HR efficiency through efficient procurement, there remains a gap in the literature regarding their specific effects in educational settings. Most

existing research focuses on traditional SCM applications in corporate environments, leaving educational institutes relatively understudied.

This research examines the direct impact of SCM practices on specific HR outcomes such as employee retention rates, productivity levels, and job satisfaction. Additionally, the interplay between SCM and HR could be explored further, focusing on how collaboration between these functions can lead to improved institutional performance. Further studies are needed to provide a comprehensive understanding of how SCM practices can be effectively applied to enhance HR efficiency in educational settings. Efficient procurement, facilitated by SCM techniques, can enhance HR efficiency in universities and educational institutes through cost savings, data-driven decision-making, improved supplier relationships, and streamlined administrative processes. By leveraging these benefits, educational institutes can improve HR operations and overall institutional performance. Given the limited existing research in this area, further studies are necessary to establish the effectiveness of SCM practices in enhancing HR efficiency within educational settings.

## **2.4 Optimization of Operations**

The impact of supply chain management (SCM) techniques on enhancing human resource (HR) efficiency in universities and educational institutes has become an area of growing interest. This literature review examines how SCM techniques can streamline operations, improve HR efficiency, and ultimately lead to better performance in educational settings. Research on the application of SCM techniques in educational institutions suggests that integrating these strategies into operational processes can lead to significant improvements in HR efficiency. For instance, effective inventory management ensures that essential educational resources such as textbooks, lab equipment, and classroom supplies are readily available when needed, reducing disruptions and delays in teaching, and learning processes (Fischer et al., 2020). By utilizing SCM methods such as demand forecasting and just-in-time inventory, educational institutions can maintain efficient resource availability while minimizing carrying costs.

Moreover, efficient logistics within universities and educational institutes can enhance the movement of goods and services across campus, facilitating smoother operations and boosting HR efficiency (Wang et al., 2021). Streamlined logistics practices support campus maintenance

and facilities management, reducing downtime and creating a conducive work environment for staff and faculty. Supplier relationship management, a key component of SCM, is another aspect that can positively impact HR efficiency in educational institutes. By fostering strong relationships with suppliers, universities can benefit from improved service quality, reliable deliveries, and potential cost savings (D'Agostino & Teece, 2022). These improvements contribute to HR efficiency by ensuring that faculty and staff have access to the resources needed to perform their roles effectively.

An integral part of SCM, provides valuable insights into operational performance and potential areas for improvement. Through the analysis of data from procurement, inventory, and logistics, educational institutions can make informed decisions about optimizing operations and enhancing HR efficiency (Hernández et al., 2019). Data-driven decision-making can identify patterns in employee workload and facilitate more equitable distribution of tasks, thereby preventing burnout and promoting a healthier work environment. The integration of technology, such as enterprise resource planning (ERP) systems and SCM software, plays a pivotal role in optimizing operations within educational institutions (Sanchez et al., 2023). These technologies enable real-time tracking and monitoring of operations, promoting efficiency and collaboration across departments, including HR. Such an integrated approach leads to better coordination and strategic planning.

In addition to operational efficiency, the use of SCM techniques aligns with sustainable and ethical practices within educational institutes. By prioritizing suppliers that adhere to sustainable and ethical standards, institutions promote responsible business practices, resonating with HR values and enhancing employee satisfaction and engagement (Kumar et al., 2019). While existing research highlights the potential benefits of applying SCM techniques in educational settings, there remains a gap in empirical studies examining the long-term impact on HR efficiency and institutional performance. Most studies focus on traditional SCM applications in corporate contexts, leaving educational environments understudied (D'Souza & Barrett, 2020). Future research should focus on quantifying specific outcomes of SCM applications, such as improvements in HR productivity, staff retention rates, and employee satisfaction.

Furthermore, studies should explore the integration of SCM and HR practices to uncover potential synergies and challenges of this interdisciplinary approach (Liu & Zhao, 2022). An emphasis on cross-disciplinary collaboration can yield a comprehensive understanding of how SCM practices enhance HR efficiency in educational settings. SCM techniques offer structured and strategic approaches to optimizing operations in universities and educational institutes. These practices enhance operational efficiency, thereby positively impacting HR efficiency and institutional performance. Given the current gap in research, more studies are needed to provide a comprehensive understanding of how SCM practices can be effectively applied to enhance HR efficiency in educational settings.

## **2.5 Vendor Relationships**

In the context of managing vendor relationships through supply chain management (SCM) techniques can have a significant impact on human resource (HR) efficiency and overall institutional performance. Effective vendor relationships enable educational institutions to secure timely access to quality goods and services, which plays a crucial role in supporting HR operations and enhancing productivity among faculty and staff. The research indicates that strong vendor relationships are fundamental to the smooth operation of educational institutions, as they ensure reliable access to necessary resources such as textbooks, technology, and classroom supplies. This, in turn, allows educators and staff to concentrate on their core responsibilities, leading to increased job satisfaction and productivity (Smith & Johnson, 2022). Conversely, weak vendor relationships can disrupt the supply chain, causing delays and inefficiencies that negatively affect the work environment for educators.

SCM practices such as strategic sourcing enable educational institutions to select vendors that align with their mission and values, including sustainable and ethical practices (Peterson & Davis, 2019). This alignment not only promotes corporate social responsibility but also resonates positively with employees, enhancing HR efficiency and satisfaction. By choosing suppliers who prioritize sustainability and ethics, educational institutions can foster a sense of shared values and responsibility among their workforces. Strategic vendor relationships can also encourage innovation and continuous improvement within educational institutions. Close collaboration with suppliers provides access to new technologies, trends, and best practices that can inform HR strategies such as modern recruitment methods, employee development programs, and



performance management systems (Lee & Chen, 2021). Such collaborations facilitate the adoption of innovative approaches in HR management, ultimately contributing to overall efficiency. Another key aspect of vendor relationships that affects HR efficiency is risk management. Long-term partnerships with reliable vendors help reduce procurement risks, such as supply disruptions or quality issues (García & Rivera, 2023). Consistent access to high-quality resources mitigates the risk of HR disruptions, enabling staff and faculty to maintain focus on their work and enhancing overall institutional performance.

Effective contract management with suppliers is essential for stable and predictable supply chain operations, which in turn supports efficient HR management (Wang et al., 2020). Well-negotiated contracts include service-level agreements (SLAs) that specify delivery times, quality standards, and other expectations. These contracts ensure that vendors meet the institution's needs, contributing to a stable work environment for educators and staff. Additionally, ongoing vendor evaluation and performance monitoring are critical SCM practices that support HR efficiency (Patel & Kumar, 2023). By assessing vendors regularly based on criteria such as quality, timeliness, and cost-effectiveness, educational institutions can identify areas for improvement and take corrective action when necessary. Consistent performance monitoring strengthens vendor relationships and leads to better outcomes for HR operations.

Despite the potential benefits of strong vendor relationships facilitated by SCM techniques, there remains a gap in the literature concerning their specific effects on HR efficiency in educational settings. Most existing research focuses on vendor relationships in corporate environments, leaving educational institutions relatively understudied (Thomas & White, 2019). The direct impact of vendor relationships on specific HR outcomes such as employee morale, productivity, and satisfaction. Additionally, studies could investigate the potential for integrating SCM practices with HR strategies to improve coordination and alignment across departments (Zhang & Wang, 2022). This interdisciplinary approach may yield a more comprehensive understanding of how SCM practices in vendor relationships can enhance HR efficiency in educational settings.

Effective vendor relationships facilitated by SCM techniques can positively impact HR efficiency in universities and educational institutes. By providing reliable access to high-quality goods and services, vendor relationships support efficient HR operations and contribute to

overall institutional performance. Given the limited research in this area, more studies are needed to provide a comprehensive understanding of how SCM practices in vendor relationships can enhance HR efficiency in educational settings.

## **2.6 Planning & Forecasting**

Planning and forecasting in the context of supply chain management (SCM) techniques can significantly enhance human resource (HR) efficiency in universities and educational institutes. SCM is integral to operational effectiveness, enabling organizations to predict future demand, optimize resource allocation, and make data-driven decisions. Within educational settings, applying these techniques can lead to improved HR operations and overall institutional performance. Research indicates that planning and forecasting are essential for optimizing university operations such as procurement, staffing, and resource management. By utilizing SCM methods like demand forecasting and strategic planning, educational institutes can anticipate future needs and prepare accordingly. This proactive approach facilitates efficient HR operations, including recruitment optimization, scheduling, and training programs.

One significant impact of planning and forecasting on HR efficiency is workforce planning. By forecasting enrollment trends and academic program requirements, universities and educational institutes can determine staffing needs in advance. This allows for strategic recruitment and training of employees, ensuring that the institution has the right talent to meet the demands of students and faculty (Kalita & Das, 2020). Planning and forecasting contribute to effective budget management in educational institutes. Predicting future expenses and revenue enables institutions to allocate resources to HR initiatives such as employee training, development, compensation, and benefits (Fleming & Houghton, 2019). Strategic budgeting can improve employee satisfaction and retention, further contributing to HR efficiency.

Demand forecasting, a crucial SCM technique, enables educational institutes to predict demand for specific courses, programs, and resources. Accurate demand forecasts guide HR decisions, such as hiring adjunct faculty or full-time professors based on anticipated student enrollment. This approach helps institutions maintain optimal HR efficiency by minimizing the risk of understaffing or overstaffing (Wang & Ng, 2021). Another aspect of planning and forecasting that impacts HR efficiency is the ability to align HR strategies with broader institutional goals.

By using SCM techniques to anticipate future trends and challenges, educational institutes can develop HR policies and programs that support long-term objectives (Kumar & Sharma, 2018). This alignment can enhance employee engagement and performance, fostering a culture of continuous improvement (Wright & Snell, 2020).

Despite the benefits of planning and forecasting for HR efficiency, challenges must be addressed. For instance, ensuring data quality and availability is crucial for accurate forecasting. Educational institutes may face limitations in data collection and analysis capabilities. Additionally, resistance to change and the implementation of new strategies can hinder the adoption of SCM techniques in HR planning and forecasting (Graham & Kim, 2018). While SCM techniques offer significant potential in planning and forecasting, there is limited research specifically focusing on their impact on HR efficiency in educational settings. Most existing studies concentrate on corporate environments, leaving educational institutes relatively understudied. More research is needed to explore the direct impact of planning and forecasting on HR outcomes such as productivity, job satisfaction, and retention rates.

The effectiveness of different forecasting models and planning strategies in enhancing HR efficiency in educational institutes. Additionally, studies could examine the integration of SCM practices with HR functions to identify potential synergies and best practices. Planning and forecasting facilitated by supply chain management techniques can have a substantial impact on HR efficiency in universities and educational institutes. By enabling strategic workforce planning, data-driven decision-making, and effective resource allocation, these techniques support HR operations and contribute to overall institutional performance. Given the limited research in this area, further studies are needed to provide a comprehensive understanding of how planning and forecasting techniques can enhance HR efficiency in educational settings.

## **2.8 Theoretical Framework**

The theoretical framework for the application of supply chain management (SCM) techniques to enhance human resource (HR) efficiency in educational institutes is based on the integration of SCM and HR management concepts, underpinned by organizational efficiency theories and strategic management principles (Eshal, 2020). This framework establishes the foundation for investigating the relationship between SCM practices and HR efficiency in educational settings.

By integrating the concepts, the framework provides a basis for exploring the potential impact of SCM strategies on HR efficiency in educational institutes. It also establishes the importance of this relationship and advancing the strategic alignment between SCM and HR management within educational environments. This framework supports the research objectives and questions set out in the study, guiding the investigation into how SCM techniques can improve HR processes and contribute to overall institutional success.

### **2.8.1 Resource Based View Theory**

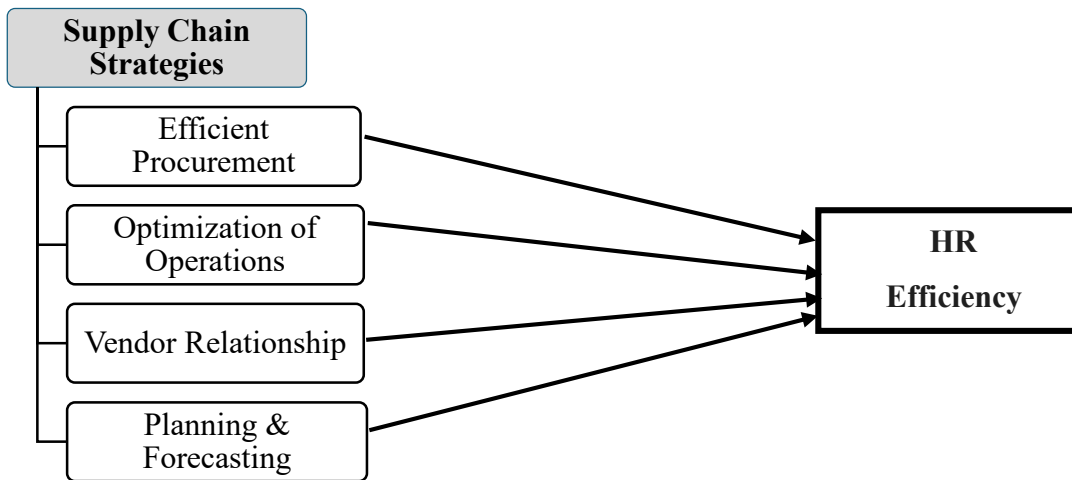
The Resource-Based View (RBV) is a strategic management framework that emphasizes the internal resources and capabilities of a firm as the primary source of its competitive advantage (Miller, D. (2019)). This approach suggests that firms can achieve and sustain competitive advantage by acquiring, developing, and managing resources that are valuable, rare, inimitable, and non-substitutable. These resources enable the firm to implement strategies that improve efficiency and effectiveness, leading to superior performance (Arokodare, M. A. 2020).

The RBV framework was initially popularized in the 1990s, particularly through the work of scholars such as Jay Barney and David J. Collis. In the RBV, resources include financial capital, physical assets, human resources, technology, and organizational processes. Capabilities refer to the firm's ability to effectively utilize its resources, such as skills and know-how that enable a firm to coordinate resources and deploy them in a strategic manner (Teece, D. J. 2019). Resources must possess certain characteristics to provide a competitive advantage: they must be valuable, rare, inimitable, and non-substitutable. Valuable resources contribute to a firm's ability to exploit opportunities or neutralize threats in the market (Sett, R. K. 2018). Rare resources are not possessed by many competing firms, giving the firm a unique advantage. Inimitable resources are difficult or costly for other firms to replicate due to unique historical conditions, causal ambiguity, or social complexity. Non-substitutable resources have no equivalent substitute available to competitors.

By possessing resources that meet these criteria, a firm can establish a sustainable competitive advantage. This advantage can be maintained over time if the firm continues to invest in, protect, and leverage its unique resources and capabilities (Donnellan, J., 2019). Firms should focus on developing and nurturing their internal resources and capabilities rather than simply trying to

compete on external factors like price. Strategic decisions should be made with a long-term perspective, considering how to build and leverage resources that can provide lasting competitive advantage (Windsperger, J. 2017). Critics of the RBV argue that it tends to overlook the role of dynamic market conditions and external factors in shaping firm strategy and performance. Additionally, the concept of resource inimitability may not always account for rapid technological advancements that can lead to changes in competitive landscapes.

## 2.9 Conceptual Framework



## 2.10 Research Hypothesis

**H1:** Efficient Procurement has a significant impact on HR Efficiency.

**H2:** Optimization of operations has a significant impact on HR Efficiency.

**H3:** Vendor Relationship has a significant impact on HR Efficiency.

**H4:** Planning & Forecasting has a significant impact on HR Efficiency.

## Chapter 3

### Research Methodology

#### 3.1 Introduction

Research methodology refers to the systematic and scientific approach used to find facts and explore new dimensions in a chosen topic. It involves the search for useful and new information, often with the aim of proving existing facts. Research methods can include study, observation, experiments, comparison, reasoning, and analysis, among others. In the study titled "Enhancing HR Efficiency through Supply Chain Management Techniques in Educational Institutes," the research aims to investigate how Supply Chain Management techniques can improve Human Resources (HR) efficiency in educational institutions.

The study begins by discussing research philosophy, which is the fundamental beliefs about the nature of the research process. This sets the tone for how the research will be conducted and interpreted. Then, the methods of data collection are analyzed and discussed. This typically involves determining how information will be gathered, whether through surveys, interviews, observations, or other means. Overall, the study aims to explore how HR efficiency can be enhanced through the application of Supply Chain Management techniques in educational institutes, using a structured research approach, appropriate design, and systematic data collection methods.

#### 3.2 Research Philosophy

In the study, the research philosophy employed to understand the nature and evolution of knowledge regarding data collection, processing, and usage is epistemology. Epistemology focuses on questions about the appropriate level of knowledge in each subject (Boon, M., & Van Baalen, S. 2019). It seeks to determine the validity of material through rigorous testing and assesses the appropriate level of expertise in the subject of study.

Positivism is the specific philosophy used in this study. Positivism involves developing research questions first and then using relevant data to progress the research (Rahi, S. 2017). It is concerned with verifying theories and making measurements against established knowledge. Positivism emphasizes producing results that can be reproduced and used by others, focusing on quantitative outcomes (Berkovich, I. 2018).

In this context, positivism is appropriate because the study aims to test hypotheses and explain

phenomena. Positivism provides a structured approach to research, allowing for systematic testing and verification of theories through empirical evidence (Rashid, A., 2021). It aligns well with the goal of the study to explore how data is collected, processed, and used in the context of enhancing HR efficiency through Supply Chain Management techniques in educational institutes.

### **3.3 Research Approach**

In the current study, a deductive technique is employed to address the research issue. Deductive reasoning involves proving an existing hypothesis. This approach begins with examining the problem statement and then providing solutions to the discovered issues in the form of a theory (Chi, M. T. 2018). In the case of this study focusing on Pakistani higher education institutions, research questions were formulated to determine how Supply Chain Management techniques can enhance HR efficiency in educational institutes. These research questions served as the basis for collecting data and analyzing the results.

The deductive approach allows researchers to start with a general theory or hypothesis and then test it against specific observations or data (Gilgun, J. F. 2019). In this study, the hypothesis that Supply Chain Management techniques can enhance HR efficiency in educational institutes is tested through data collection and analysis. By following a deductive approach, researchers aim to provide empirical evidence to support or refute the hypothesis, thereby contributing to the existing body of knowledge on the topic.

### **3.4 Research design**

In this study, a descriptive research design was used to explore and understand how Supply Chain Management (SCM) techniques can enhance HR efficiency in educational institutes. Descriptive research is employed to describe characteristics of a phenomenon or population being studied, providing a detailed account of the current situation (Bradshaw, C., 2017). It allows researchers to gather information about the existing situation, attitudes, behaviors, or conditions related to the topic under investigation. In the context of this study, descriptive research enables researchers to describe and analyze the current practices and strategies related to HR efficiency in educational institutes, particularly focusing on how SCM techniques are being utilized or can be utilized to improve HR functions (Mohajan, H. K. 2020). Through surveys methods, data would be collected to provide a comprehensive understanding of the relationship between SCM techniques and HR efficiency in educational institutes. This data would then be analyzed to draw conclusions and make recommendations for improving HR practices in educational settings.

### **3.5 Unit of Analysis**

In this study, data was collected from the teaching faculty of private universities in Rawalpindi and Islamabad. This means that the participants of the study were specifically the teaching staff employed in private universities in these two cities. Therefore, the focus of data analysis in this research was on the teaching faculty of private universities (Mahdi, O. R., 2019). The data collected from these participants would have been used to analyze various aspects related to the research topic, such as their perceptions, experiences, practices, and attitudes regarding the use of Supply Chain Management techniques to enhance HR efficiency in educational institutes. This narrowed focus allows for a detailed examination of the specific group of individuals who play a significant role in the educational process within the context of private universities in Rawalpindi and Islamabad.

### **3.6 Target Population**

The target population of this study is the higher educational institutions of Pakistan, with a specific focus on private universities located in Rawalpindi and Islamabad, including Bahria University, Air University, Iqra University, and SZABIST. The number of faculty members available on the websites of these universities is as follows:

- Bahria University
- Air University
- Iqra University
- SZABIST

Specific numbers for each university would be provided based on the information available on their respective websites. This information serves as the basis for determining the potential participants for the study, namely the teaching faculty members of these private universities in Rawalpindi and Islamabad (Ameer, 2020). The population size for this study is 250 employees working in these universities.

### **3.7 Sampling**

The Morgan table (1970) is a commonly used method for determining sample size in research studies. According to this method, a sample size of 152 has been calculated for this study. This means that the researchers have determined that a sample of 152 participants is sufficient to achieve the study's objectives and provide statistically significant results. In the context of this study, with a target population consisting of the teaching faculty of private universities in



Rawalpindi and Islamabad, a sample size of 152 participants has been selected to represent this population (Shabbir, A. 2018). This sample size is deemed appropriate to gather data and draw conclusions about the perceptions, experiences, and practices of the teaching faculty regarding the use of Supply Chain Management techniques to enhance HR efficiency in educational institutes.

### **3.8 Sampling Technique**

In this study, a simple random sampling technique will be used to select participants from the target population of teaching faculty in private universities in Rawalpindi and Islamabad (Shah, N. H., Ishaq, M., & Nawaz, A. 2020). Simple random sampling involves selecting individuals from a population in such a way that everyone has an equal chance of being chosen, and each combination of individuals has an equal chance of being selected as the sample. By employing simple random sampling, the researchers can ensure that the sample is representative of the entire population of interest, and the results can be generalized to the broader population of teaching faculty in private universities in Rawalpindi and Islamabad (Rashid & Imran, M. (2022).

### **3.9 Measurement/Scale Used**

The study adapted five-point Likert scale which allows the researcher to analyze the data clearly through comparisons and through reporting how negatively or positively a respondent was inclined to the element in the questionnaire (Johns, 2010). Each variable of the study was measured using the five-point Likert scale. Range is from 1 to 5. Where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree. (Sounders, Lewis, & Thornhill, 2016).

### **3.10 Research Instrument**

To analyze the enhancement of HR efficiency through Supply Chain Management (SCM) techniques in educational institutes, first-hand source data is collected using a structured questionnaire. The questionnaire adaptive from Xhavit Islami (2021) The relation between human resource management practices, supply chain management practices and competitive strategy as strategic instruments and their impact on organizational performance in manufacturing industry. By incorporating questions from these studies, the questionnaire ensures reliability and validity in measuring the constructs of interest. Participants' responses to these questions will be analyzed to assess the impact of SCM techniques on HR efficiency in educational institutes, considering factors like servant leadership, employee creativity, and work engagement.

### **3.11 Data collection Tool**

After adapting the questionnaires, they were further simplified to ensure ease of response, accuracy, and reliability, following the elimination of any vagueness in the questions (Flick, 2015). A systematic questionnaire was distributed to respondents working in private universities in the twin cities of Rawalpindi and Islamabad, Pakistan, to collect data (Naveed, A. 2023). The surveys were disseminated online using "Google Docs," and data collection was also done in person, according to the study's methodology. The questionnaire data were correctly synchronized to ensure appropriate results and conclusions. Within a span of 25 days, a total of 152 completed questionnaires were received, and there were no missing replies in any of the surveys returned. Using IBM SPSS Statistics 25, the 152 valid replies were obtained and evaluated for analysis. This rigorous data collection and analysis process ensured that the study's findings were based on a robust dataset and could be considered reliable for drawing conclusions.

### **3.11 Data Analysis Techniques**

Once the data has been collected, various tests are used to complete the data analysis process (Kumar, 2019). In this study, the collected data has been analyzed using regression and correlation analyses conducted using SPSS software. Globally, statistical techniques such as regression and correlation are frequently utilized for data analysis due to their high reliability and validity (Hopkins, W. G. 2017). Correlation analysis examines the strength and direction of relationships between variables, while regression analysis helps in understanding how one or more independent variables predict a dependent variable. Additionally, reliability and validity tests are conducted to ensure the accuracy and consistency of the measurement tools used in the study. Furthermore, the analysis is used to explore the indirect effects of variables on the relationship between independent and dependent variables (Sadia, 2020). By employing these statistical techniques, the study aims to draw conclusions regarding the impact of Supply Chain Management techniques on HR efficiency in educational institutes.

## Chapter 4

### Result & Analysis

#### 4.1 Introduction

This section will delve into the methodologies and tools employed in the study. The findings of the research were recorded and analyzed using SPSS software. This section validates the consistency and credibility of research models through various statistical analyses, including frequency distribution, regression analysis, and correlation. The focus of this study is to examine "Enhancing HR Efficiency through Supply Chain Management Techniques in Educational Institutes." In this context, the independent variables are Efficient Procurement, Optimization of Operations, Vendor Relationship, and Planning & Forecasting, while HR Efficiency serves as the dependent variable. These analyses help to determine the relationships between the independent variables and HR efficiency, providing insights into how SCM techniques can be utilized to improve HR practices in educational institutions. The data for this study was collected from teaching faculty at private universities in Rawalpindi and Islamabad, specifically from Bahria University, Air University, Iqra University, and SZABIST. A structured questionnaire was used to gather data, which was disseminated online using Google Docs and collected in person. The questionnaire was designed to be straightforward and free of vagueness, ensuring accurate and reliable responses. By employing these methodologies and tools, the study aims to provide a detailed and robust understanding of how SCM techniques can enhance HR efficiency in educational institutes. The findings will offer valuable insights and practical recommendations for educational administrators looking to improve their HR practices through effective SCM strategies.

#### 4.2 Demographic description

The data acquired by the researcher has been divided into multiple classifications to facilitate a comprehensive understanding. Employees from private universities, specifically Bahria University, Air University, Iqra University, and SZABIST, were included in the study. These universities represent private higher education institutions in Rawalpindi and Islamabad, ensuring that the findings are broadly representative of the faculty in these regions. The demographic table categorizes the faculty members based on several key characteristics: gender, age, education level, and experience. Classifying by gender helps understand the distribution of

male and female faculty members and analyze any gender-specific trends or insights. Age groups categorize the respondents and may provide insights into generational differences in perceptions and responses. Education level includes the highest degree attained by the faculty members, which can influence their perspectives. Years of experience in teaching or related fields significantly impact faculty members' views and practices, making this a crucial classification for analysis.

**Table 1**

<b>Demographics</b>		<b>Frequencies</b>	<b>Percentages</b>	<b>Cumulative Percentage</b>
<b>Gender</b>	Male	117	77	77
	Female	35	23	100
<b>Age</b>	20-30	134	88	88
	31-40	12	8	96
	41-50	3	2	98
	Above 50	3	2	100
<b>Education level</b>	Matriculation/O-Level	1	1	1
	Intermediate/A-Level	6	4	5
	Bachelors	54	35	40
	Masters	90	59	99
	PhD	1	1	100
<b>Professional Experience</b>	Less a year	56	37	37
	1-3 years	56	37	74
	4-6 years	19	12	86
	7-9 years	6	4	90
	Above 9 years	15	10	100
<b>Designation</b>	Senior Manager	20	13	13
	Middle Level Manager	38	25	38
	Supporting Staff	49	32	70
	Executive	24	16	86
	Front Line Manager	21	14	100

The demographic table shows that most respondents are male (77%) and predominantly young, with 88% aged between 20-30 years. Most have attained a master's degree (59%), and the distribution of professional experience varies, with 37% having less than a year of experience and another 37% having 1-3 years. In terms of job roles, the largest group consists of supporting staff (32%), followed by middle-level managers (25%). This diverse representation across gender, age, education level, professional experience, and designation provides a comprehensive context for analyzing the impact of Supply Chain Management techniques on HR efficiency in private universities in Rawalpindi and Islamabad.

### 4.3 Reliability test

The consistency and reliability of questionnaire items for each study variable have been assessed using a reliability test. Based on Chang's (2017) classification, Cronbach's alpha values provide four levels of reliability. An alpha value of 0.9 and above signifies excellent reliability, 0.70-0.9 indicates high reliability, 0.50-0.70 indicates moderate reliability, and values below 0.50 indicate low reliability. The tables below display the results of the SPSS reliability test, indicating that the five variables utilized in this study exhibit satisfactory reliability.

**Table 2 Cronbach's Alpha  
Reliability Test Results Summary**

<b>Variables</b>	<b>Sample size</b>	<b>items</b>	<b>Cronbach's Alpha</b>	<b>Reliability</b>
<b>Efficient Procurement</b>	152	5	0.817	High
<b>Optimization of operations,</b>	152	5	0.860	High
<b>Vendor Relationship</b>	152	5	0.866	High
<b>Planning &amp; Forecasting</b>	152	5	0.820	High
<b>HR Efficiency</b>	152	5	0.842	High

The Cronbach's alpha reliability table presents the internal consistency of measurement scales used in the study, assessing the reliability of the items measuring different constructs. With sample sizes of 152 and five items each, efficient procurement, optimization of operations, vendor relationship, planning and forecasting, and HR efficiency all exhibit high reliability, as indicated by Cronbach's alpha coefficients ranging from 0.817 to 0.866. These coefficients suggest that the items within each construct consistently measure the same underlying concept, demonstrating reliability in their ability to accurately capture the intended constructs. Overall, the high reliability coefficients across all variables underscore the robustness of the measurement scales employed in the study, bolstering confidence in the accuracy and consistency of the data collected and analyzed.

#### **4.4 Correlation Analysis**

In the provided context, correlation analysis is utilized to assess the relationship between the dependent and independent variables, gauging the strength of their association. This statistical method, often conducted using the Pearson correlation coefficient (referred to as "r"), is a common approach for quantifying the degree of linear relationship between two variables. The correlation findings, typically presented in a correlation table, offer insights into the direction and magnitude of relationships among variables. By examining the correlation coefficients, researchers can determine whether and to what extent changes in one variable are associated with changes in another. These correlations serve as valuable indicators for understanding the interconnections between different factors under investigation, providing essential insights for interpreting research results and identifying potential patterns or trends within the data.

**Table 3**

<b>Correlations</b>						
		<b>Efficient Procurement</b>	<b>Optimization of operations</b>	<b>Vendor Relationship</b>	<b>Planning &amp; Forecasting</b>	<b>HR Efficiency</b>
<b>Efficient Procurement</b>	<b>Pearson Correlation</b>	1				
<b>Optimization of operations,</b>	<b>Pearson Correlation</b>	.655**	1			
<b>Vendor Relationship</b>	<b>Pearson Correlation</b>	.603**	.630**	1		
<b>Planning &amp; Forecasting</b>	<b>Pearson Correlation</b>	.521**	.614**	.507**	1	
<b>HR Efficiency</b>	<b>Pearson Correlation</b>	.594**	.618**	.576**	.523**	1
	<b>Sig. (2-tailed)</b>	<.001	<.001	<.001	<.001	
	<b>N</b>	152	152	152	152	152
** . Correlation is significant at the 0.01 level (2-tailed).						

**Correlation between Efficient Procurement and HR Efficiency**

The Pearson correlation coefficient (r) measures the strength and direction of the linear relationship between Efficient Procurement and other variables. For example, there is a strong positive correlation between Efficient Procurement and Optimization of Operations ( $r = 0.655$ ), indicating that as the efficiency of procurement increases, the optimization of operations tends to increase as well. Similar positive correlations are observed with Vendor Relationship, Planning & Forecasting, and HR Efficiency, suggesting that improvements in Efficient Procurement are associated with enhancements in these areas too.



### **Correlation between optimization of operations and HR Efficiency**

Similarly, Optimization of Operations exhibits strong positive correlations with Efficient Procurement ( $r = 0.655$ ), Vendor Relationship ( $r = 0.630$ ), Planning & Forecasting ( $r = 0.614$ ), and HR Efficiency ( $r = 0.618$ ). These correlations suggest that improvements in Optimization of Operations are associated with improvements in Efficient Procurement, Vendor Relationship, Planning & Forecasting, and ultimately HR Efficiency.

### **Correlation between vendor relationship and HR Efficiency**

The Vendor Relationship also shows positive correlations with Efficient Procurement ( $r = 0.603$ ), Optimization of Operations ( $r = 0.630$ ), Planning & Forecasting ( $r = 0.507$ ), and HR Efficiency ( $r = 0.576$ ). These correlations indicate that enhancements in Vendor Relationship are associated with improvements in Efficient Procurement, Optimization of Operations, Planning & Forecasting, and HR Efficiency.

### **Correlation between planning & forecasting and HR Efficiency**

Similarly, Planning & Forecasting exhibits positive correlations with Efficient Procurement ( $r = 0.521$ ), Optimization of Operations ( $r = 0.614$ ), Vendor Relationship ( $r = 0.507$ ), and HR Efficiency ( $r = 0.523$ ), suggesting that improvements in Planning & Forecasting are associated with enhancements in these areas too.

### **Correlation between All variable and HR Efficiency**

Finally, HR Efficiency shows positive correlations with Efficient Procurement ( $r = 0.594$ ), Optimization of Operations ( $r = 0.618$ ), Vendor Relationship ( $r = 0.576$ ), and Planning & Forecasting ( $r = 0.523$ ), indicating that improvements in these areas are associated with enhancements in HR Efficiency.

## **4.5 Regression analysis**

Regression analysis is a statistical technique used to examine the relationship between one dependent variable and one or more independent variables. In this analysis, the dependent variable is the outcome or response variable, while the independent variables are predictors or factors that may influence the dependent variable. The goal of regression analysis is to model and understand how changes in the independent variables are associated with changes in the dependent variable. By fitting a regression model to the data, we can estimate the strength and direction of these relationships and make predictions about the dependent variable based on the

values of the independent variables. The regression model calculates coefficients for each independent variable, representing the magnitude of their impact on the dependent variable, as well as an intercept term. Overall, regression analysis is a powerful tool for exploring and quantifying relationships between variables, making it widely used in various fields such as economics, finance, psychology, and social sciences.

**Table 4**

<b>Model Summary</b>				
<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.692 <sup>a</sup>	.596	.591	.3278

a. Predictors: (Constant), Efficient Procurement, Optimization of operations, Vendor Relationship, Planning & Forecasting

The regression table provides a concise overview of the regression analysis conducted on the data, offering key insights into the performance of the regression model. The correlation coefficient (R) of 0.692 suggests a moderately strong positive correlation between the predictors and the dependent variable, while the coefficient of determination (R Square) of 0.596 indicates that approximately 59.6% of the variance in the dependent variable is explained by the independent variables included in the model. The Adjusted R Square value of 0.591 adjusts for the number of predictors in the model, providing a more accurate reflection of the model's explanatory power. Additionally, the standard error of the estimate (0.3278) gives an indication of the accuracy of the predictions made by the regression model. Overall, the regression table offers valuable insights into the relationship between the predictors (Efficient Procurement, Optimization of Operations, Vendor Relationship, and Planning & Forecasting) and the dependent variable, highlighting the model's ability to explain and predict variations in the dependent variable based on the independent variables included in the analysis.

## 4.6 ANOVA

**Table 5**

### ANOVA

<b>Model</b>		<b>Sum of Squares</b>	<b>DF</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
1	Regression	60.467	4	15.117	27.554	<.001 <sup>b</sup>
	Residual	15.476	144	.541		
	Total	75.943	148			

a. Dependent Variable: HR Efficiency

b. Predictors: (Constant), Efficient Procurement, Optimization of operations, Vendor Relationship, Planning & Forecasting

The ANOVA table offers a concise summary of the regression analysis, providing key insights into the significance of the regression model in explaining variations in the dependent variable, HR Efficiency. With a significant F-value of 27.554 and a corresponding p-value of less than 0.001, the table indicates that the regression model, which includes predictors such as Efficient Procurement, Optimization of Operations, Vendor Relationship, and Planning & Forecasting, is statistically significant. This suggests that at least one of the predictors has a significant effect on HR Efficiency. Additionally, the Model Sum of Squares of 60.467 and the Mean Square of 15.117 further support the notion of a strong relationship between the predictors and the dependent variable. Overall, the ANOVA table provides compelling evidence of the predictive power of the regression model in explaining variations in HR Efficiency based on the included predictors.

## 4.7 Coefficient

**Table 6**

### Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.407	.166		2.449	.016
Efficient Procurement	.246	.063	.262	3.872	.000
Optimization of operations,	.208	.080	.226	2.584	.003
Vendor Relationship	.460	.071	.210	2.397	.000
Planning & Forecasting	.379	.071	.377	5.376	.002

a. Dependent Variable: HR Efficiency

The coefficient table provides valuable insights into the regression model by presenting the coefficients associated with each predictor variable, along with their standard errors, standardized coefficients (Beta), t-values, and significance levels (Sig.). Here's a detailed explanation:

**Unstandardized Coefficients (B):** These coefficients represent the change in the dependent variable (HR Efficiency) for a one-unit change in the predictor variable while holding other variables constant. For example, the coefficient for Efficient Procurement (B = 0.246) suggests that for every one-unit increase in Efficient Procurement, HR Efficiency is expected to increase by 0.246 units, all else being equal.

Standardized Coefficients (Beta): These coefficients represent the change in the dependent variable (HR Efficiency) in standard deviation units for a one-standard-deviation change in the predictor variable. They allow for a comparison of the relative importance of each predictor variable. For instance, the standardized coefficient for Efficient Procurement (Beta = 0.262) indicates that Efficient Procurement has a moderate positive impact on HR Efficiency, with a one-standard-deviation increase in Efficient Procurement associated with a 0.262 standard deviation increase in HR Efficiency.

t-value: The t-value measures the significance of each coefficient. It is calculated by dividing the unstandardized coefficient by its standard error. A higher absolute t-value indicates a more significant impact of the predictor variable on the dependent variable. For example, the t-value for Planning & Forecasting ( $t = 5.376$ ) indicates that the coefficient for this predictor variable is statistically significant.

Significance Level (Sig.): This indicates the probability of observing the t-value under the null hypothesis that the coefficient is equal to zero. A significance level less than 0.05 (typically denoted as  $<0.05$  or any value less than 0.05) indicates that the coefficient is statistically significant. In this table, all predictor variables have significance levels less than 0.05, suggesting that they all have a significant impact on HR Efficiency.

Overall, the coefficient table provides valuable information about the strength, direction, and significance of the relationships between the predictor variables (Efficient Procurement, Optimization of Operations, Vendor Relationship, and Planning & Forecasting) and the dependent variable (HR Efficiency) in the regression model.

## **4.9 Results**

### **H1: Efficient Procurement has a significant impact on HR Efficiency.**

The results indicate that Efficient Procurement has a significant impact on HR Efficiency. This is supported by a significant unstandardized coefficient ( $B = 0.246$ ,  $p < 0.001$ ) and a standardized coefficient (Beta = 0.262) for Efficient Procurement. The positive coefficient suggests that as

Efficient Procurement increases, HR Efficiency tends to increase as well. The significance level ( $p < 0.001$ ) indicates that the impact of Efficient Procurement on HR Efficiency is statistically significant, supporting the hypothesis that Efficient Procurement has a significant effect on HR Efficiency.

**H2: Optimization of operations has a significant impact on HR Efficiency.**

The analysis reveals that Optimization of Operations significantly impacts HR Efficiency. This is evidenced by a significant unstandardized coefficient ( $B = 0.208$ ,  $p = 0.003$ ) and standardized coefficient ( $Beta = 0.226$ ) for Optimization of Operations. The positive coefficient suggests that improvements in Optimization of Operations are associated with increases in HR Efficiency. The significance level ( $p = 0.003$ ) indicates that this impact is statistically significant, supporting the hypothesis that Optimization of Operations has a significant effect on HR Efficiency.

**H3: Vendor Relationship has a significant impact on HR Efficiency.**

The results demonstrate that Vendor Relationship significantly affects HR Efficiency. This is supported by a significant unstandardized coefficient ( $B = 0.460$ ,  $p < 0.001$ ) and standardized coefficient ( $Beta = 0.210$ ) for Vendor Relationship. The positive coefficient suggests that strengthening Vendor Relationships is associated with improvements in HR Efficiency. The significance level ( $p < 0.001$ ) indicates that this impact is statistically significant, supporting the hypothesis that Vendor Relationship has a significant effect on HR Efficiency.

**H4: Planning & Forecasting has a significant impact on HR Efficiency.**

The analysis indicates that Planning & Forecasting significantly impacts HR Efficiency. This is evidenced by a significant unstandardized coefficient ( $B = 0.379$ ,  $p < 0.001$ ) and standardized coefficient ( $Beta = 0.377$ ) for Planning & Forecasting. The positive coefficient suggests that effective Planning & Forecasting practices are associated with increases in HR Efficiency. The significance level ( $p < 0.001$ ) indicates that this impact is statistically significant, supporting the hypothesis that Planning & Forecasting has a significant effect on HR Efficiency.

**Table 10**

<b>Varibales</b>	<b>Significance level</b>	<b>Result</b>	<b>Outcome</b>
<b>Efficient Procurement</b>	0.000	Positive impact on HR Efficiency	Hypothesis accepted
<b>Optimization of operations,</b>	0.003	Positive impact on HR Efficiency	Hypothesis accepted
<b>Vendor Relationship</b>	0.000	Positive impact on HR Efficiency	Hypothesis accepted
<b>Planning &amp; Forecasting</b>	0.002	Positive impact on HR Efficiency	Hypothesis accepted

## Chapter 5

### Discussion, Conclusion and Recommendations

#### 5.1 Discussion

The results discussion sheds light on the pivotal role of Supply Chain Management (SCM) practices in influencing Human Resources (HR) Efficiency within educational institutes. The analysis reveals that all four predictor variables—Efficient Procurement, Optimization of Operations, Vendor Relationship, and Planning & Forecasting—demonstrate significant impacts on HR Efficiency, thereby validating the research hypotheses (Qianli, D. 2017). This finding underscores the critical interplay between SCM strategies and HR performance, emphasizing the need for educational institutes to adopt effective SCM practices to enhance their HR operations (Ismail, N. A. 2022).

Efficient Procurement emerges as a significant predictor of HR Efficiency, with a positive coefficient indicating that improvements in procurement processes are associated with increases in HR Efficiency (Dirhamsyah, I. P. 2022). This result aligns with the notion that streamlined procurement practices contribute to cost savings, resource optimization, and overall organizational efficiency. By efficiently managing the acquisition of goods and services, educational institutes can allocate resources more effectively towards HR initiatives, such as talent acquisition, training, and development, thereby enhancing HR Efficiency (Masenya, T. M. 2022).

Similarly, Optimization of Operations is found to have a significant impact on HR Efficiency, highlighting the importance of streamlining operational processes within educational institutes. A positive coefficient suggests that efforts to optimize operations, such as workflow automation, process reengineering, and resource allocation, are associated with improvements in HR Efficiency (Hashem, G. 2020). By eliminating bottlenecks, reducing redundancies, and enhancing productivity, optimized operations enable HR departments to operate more efficiently, deliver services more effectively, and contribute to overall organizational performance (Madhani, P. M. 2022).



Furthermore, Vendor Relationship emerges as a key determinant of HR Efficiency, emphasizing the importance of fostering strong partnerships with suppliers and service providers (Senelwa, A. 2022). A positive coefficient indicates that nurturing vendor relationships is associated with improvements in HR Efficiency. By collaborating closely with vendors, educational institutes can access high-quality goods and services, negotiate favorable terms, and mitigate supply chain risks, thereby ensuring smooth HR operations and enhancing overall organizational effectiveness (Shaoping, L. (2023).

Moreover, Planning & Forecasting is identified as a significant predictor of HR Efficiency, highlighting the critical role of strategic planning, and forecasting in HR management (Rahaman, M., & Bari, M. 2024). A positive coefficient suggests that effective planning and forecasting practices are associated with increases in HR Efficiency. By anticipating future HR needs, aligning HR strategies with organizational goals, and proactively addressing workforce challenges, educational institutes can enhance their HR Efficiency and drive sustainable growth (Olawale, O. 2024).

Overall, the results discussion underscores the intricate relationship between SCM practices and HR Efficiency within educational institutes. By adopting efficient procurement processes, optimizing operations, nurturing vendor relationships, and implementing effective planning and forecasting practices, educational institutes can enhance their HR Efficiency, improve organizational performance, and achieve strategic objectives. These findings provide valuable insights for educational leaders, HR practitioners, and SCM professionals seeking to optimize HR operations and drive organizational success in the dynamic educational landscape.

## **5.2 Conclusion**

The conclusion of this research underscores the critical importance of Supply Chain Management (SCM) practices in enhancing Human Resources (HR) Efficiency within educational institutes. The study's findings highlight the significant impact of four key SCM variables—Efficient Procurement, Optimization of Operations, Vendor Relationship, and Planning & Forecasting—on HR Efficiency, as evidenced by their positive coefficients and statistical significance. These results affirm the hypotheses posited at the outset of the research, indicating that improvements in SCM practices lead to tangible enhancements in HR operations and organizational

effectiveness. First and foremost, the research demonstrates that Efficient Procurement plays a vital role in shaping HR Efficiency within educational institutes. By streamlining procurement processes, educational institutions can optimize resource allocation, reduce costs, and improve the quality of goods and services acquired. This, in turn, enables HR departments to operate more efficiently, allocate resources judiciously, and focus on strategic initiatives such as talent acquisition and development. Consequently, investments in efficient procurement practices yield significant dividends in terms of HR Efficiency and organizational performance. Similarly, Optimization of Operations emerges as a critical factor driving HR Efficiency in educational institutes. By optimizing operational processes, educational institutions can eliminate inefficiencies, enhance productivity, and deliver services more effectively. This not only enables HR departments to function more smoothly but also enhances the overall organizational agility and responsiveness. Consequently, investments in operational optimization initiatives contribute to improved HR Efficiency and organizational resilience. Furthermore, the research underscores the importance of Vendor Relationship management in influencing HR Efficiency. By fostering strong partnerships with suppliers and service providers, educational institutes can ensure a steady supply of high-quality goods and services, negotiate favorable terms, and mitigate supply chain risks. This enables HR departments to operate more efficiently, maintain service levels, and deliver value to stakeholders. Consequently, investments in vendor relationship management initiatives are instrumental in enhancing HR Efficiency and organizational competitiveness. Moreover, Planning & Forecasting emerges as a key driver of HR Efficiency within educational institutes. By adopting effective planning and forecasting practices, educational institutions can anticipate future HR needs, align HR strategies with organizational goals, and proactively address workforce challenges. This enables HR departments to respond more effectively to changing demands, optimize resource allocation, and drive organizational success. Consequently, investments in planning and forecasting initiatives are essential for enhancing HR Efficiency and fostering organizational resilience.

The research underscores the critical role of SCM practices in shaping HR Efficiency within educational institutes. By investing in efficient procurement processes, optimizing operations, nurturing vendor relationships, and implementing effective planning and forecasting practices, educational institutions can enhance their HR operations, improve organizational performance,

and achieve strategic objectives. These findings provide valuable insights for educational leaders, HR practitioners, and SCM professionals seeking to optimize HR operations and drive organizational success in the dynamic educational landscape.

### **5.3 Recommendations**

Educational institutes can enhance their Human Resources (HR) Efficiency by implementing several key recommendations derived from the findings of this research. Investing in technology and automation tools can streamline procurement processes and optimize operations, while prioritizing the development of strong vendor relationships can ensure a reliable supply chain. Additionally, investing in talent development initiatives, adopting strategic planning practices, and promoting cross-functional collaboration between HR and Supply Chain Management (SCM) departments can further drive organizational effectiveness. Monitoring performance metrics, embracing continuous improvement, and staying agile and adaptive to changing market dynamics are also essential strategies for enhancing HR Efficiency. By implementing these recommendations, educational institutes can leverage SCM practices to drive HR Efficiency and achieve organizational success in today's dynamic educational landscape.

### **5.4 Research Implications**

The research findings carry significant implications for both theory and practice in the fields of Supply Chain Management (SCM) and Human Resources (HR) within educational institutes. From a theoretical perspective, the study contributes to the growing body of knowledge by empirically demonstrating the critical interplay between SCM practices and HR Efficiency in educational settings. The identification of four key SCM variables—Efficient Procurement, Optimization of Operations, Vendor Relationship, and Planning & Forecasting—as significant predictors of HR Efficiency provide valuable insights into the underlying mechanisms driving organizational performance in the educational context. Moreover, the study extends existing literature by highlighting the specific roles and impacts of these SCM variables on HR operations, thus enriching our understanding of their significance in organizational effectiveness within educational institutes.

From a practical standpoint, the research offers actionable insights and recommendations for educational leaders, HR practitioners, and SCM professionals seeking to enhance HR Efficiency through effective SCM practices. By recognizing the importance of investing in technology and automation tools, fostering strong vendor relationships, and promoting cross-functional collaboration between HR and SCM departments, educational institutes can optimize HR operations and drive organizational success. Furthermore, the identification of performance metrics, continuous improvement strategies, and adaptive approaches to change management provides practical guidance for implementing and sustaining effective SCM practices within educational settings. Ultimately, the research implications underscore the importance of integrating SCM principles into HR management strategies to enhance organizational performance and achieve strategic objectives in the dynamic educational landscape.

### **5.5 Research Limitations**

Despite the valuable insights provided by this research, several limitations should be acknowledged. Firstly, the study's focus on private universities in Rawalpindi and Islamabad may limit the generalizability of the findings to other educational contexts or types of institutions. Future research could consider expanding the scope to include public universities or educational institutes in different regions to enhance the external validity of the findings. Additionally, the use of self-reported data via structured questionnaires may introduce response bias or social desirability bias, potentially impacting the accuracy and reliability of the results. Employing diverse data collection methods, such as interviews or observational studies, could provide a more comprehensive understanding of the research phenomenon. Furthermore, the cross-sectional nature of the study design limits the ability to establish causal relationships between SCM practices and HR Efficiency. Longitudinal studies or experimental designs could offer deeper insights into the temporal dynamics and causal mechanisms underlying the observed relationships. Lastly, the research focused solely on SCM variables and their impacts on HR Efficiency, neglecting potential moderating or mediating factors that may influence these relationships. Future research could explore the role of contextual factors, organizational culture, or leadership styles in shaping the effectiveness of SCM practices in HR management within educational institutes. Addressing these limitations can enrich our understanding of the

complex dynamics between SCM and HR practices and inform more robust strategies for organizational improvement in the educational sector.

### **5.6 Scope of Future Research**

The findings of this research open avenues for future studies that can further deepen our understanding of the relationship between Supply Chain Management (SCM) practices and Human Resources (HR) Efficiency within educational institutes. Firstly, future research could explore the mediating or moderating mechanisms underlying the observed relationships between SCM variables and HR Efficiency. Investigating how factors such as organizational culture, leadership styles, or technological capabilities influence the effectiveness of SCM practices in HR management can provide valuable insights into enhancing organizational performance. Additionally, longitudinal studies could track the long-term impacts of SCM interventions on HR Efficiency over time, allowing for a more dynamic understanding of the causal relationships involved. Furthermore, comparative studies across different types of educational institutions or regions could offer insights into the contextual factors shaping the effectiveness of SCM practices in HR management. Moreover, qualitative research methods, such as interviews or case studies, could provide deeper insights into the lived experiences of HR professionals and SCM practitioners in implementing SCM practices within educational settings. Lastly, exploring the intersectionality of SCM and HR with other organizational functions, such as finance or marketing, could shed light on the holistic implications of SCM strategies on overall organizational performance. By addressing these avenues for future research, scholars can contribute to advancing theoretical knowledge and informing practical strategies for optimizing HR operations through effective SCM practices in the educational sector.

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**Appendix**  
**Enhancing HR Efficiency through Supply Chain Management Techniques in**  
**Educational Institutes**

**Research Questionnaire**

This survey has been created with the sole intention of gathering information on the " Enhancing HR Efficiency through Supply Chain Management Techniques in Educational Institutes. The information gathered will be treated with a high degree confidentiality and will only be used for academic purposes. You are kindly asked to fill out this questionnaire by circling appropriate answers.

**Section A: General Information**

**Gender:**

- Male
- Female

**Education level:**

- Matriculation/O-Level
- Intermediate/A-Level
- Bachelors
- Masters
- PhD

**Organization:** \_\_\_\_\_

**Designation:**

- Senior Manager
- Middle Level Manager
- Supporting Staff
- Executive
- Front Line Manager

**Job Experience:**

- Less than a year
- 1-3
- 4-6

- 7-9
- More

<b>Scale</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
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**Section B: Independent Variables**

<b>Efficient Procurement</b>	<b>SDA</b>	<b>DA</b>	<b>N</b>	<b>A</b>	<b>SA</b>
The institute has a systematic approach to sourcing materials and services.	1	2	3	4	5
Procurement decisions are made based on quality and cost-effectiveness.	1	2	3	4	5
The institute has established relationships with reliable suppliers.	1	2	3	4	5
There are clear guidelines for managing contracts and agreements.	1	2	3	4	5
The procurement process is transparent and efficient.	1	2	3	4	5
<b>Optimization of Operations</b>					
Supply chain management techniques have improved the allocation of resources within the institute (e.g., staff, materials, facilities).	1	2	3	4	5
The use of supply chain management techniques has led to more efficient processes in the institute (e.g., streamlined operations, reduced redundancy).	1	2	3	4	5
The implementation of supply chain management techniques has contributed to better cost control in the institute.	1	2	3	4	5

The institute uses technology effectively to manage its supply chain and optimize operations.	1	2	3	4	5
Supply chain management techniques have improved decision-making processes by providing timely and accurate data.	1	2	3	4	5
<b>Vendor Relationship</b>					
The institute maintains strong relationships with its vendors.	1	2	3	4	5
Vendor performance is regularly evaluated and managed.	1	2	3	4	5
There is clear communication with vendor about expectations and standards.	1	2	3	4	5
The institute collaborates with vendors for mutual benefit.	1	2	3	4	5
Vendors are responsive to the institute's needs and requests.	1	2	3	4	5
<b>Planning and Forecasting</b>					
The institute accurately forecasts future demand for materials and resources.	1	2	3	4	5
Planning processes are informed by historical data and trends.	1	2	3	4	5
Demand planning is flexible to accommodate changes in enrollment and curriculum.	1	2	3	4	5
The institute uses technology and data analytics to enhance demand planning.	1	2	3	4	5
The institute's demand planning process is proactive and anticipatory.	1	2	3	4	5



## Section C: HR Efficiency

<b>HR Efficiency</b>	<b>SDA</b>	<b>DA</b>	<b>N</b>	<b>A</b>	<b>SA</b>
Our institute's HR practices are efficient.	1	2	3	4	5
Integrating supply chain techniques can enhance HR efficiency.	1	2	3	4	5
Our institute effectively uses technology to streamline HR processes.	1	2	3	4	5
There is effective collaboration between HR and other departments.	1	2	3	4	5
"Investing in HR training significantly improves efficiency.	1	2	3	4	5

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