Human Performance in Supply Chain Management

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Although the concept of supply chain management (SCM) has been widely accepted among academics and practitioners, the influence of human performance on the supply chain has gained little research attention. Without satisfactory performance of qualified and capable employees dedicated to perform as trained, supply chain strategies are difficult to implement successfully. This article uses the resource-based view of the firm (RBV) to emphasize the importance of human performance in SCM and proposes a conceptual model. It is argued that effective management of human performance requires systematic effort across the supply chain. This article provides a detailed discussion on human resource management (HRM) practices that can help firms achieve and maintain superior supply chain human performance.

Keywords: supply chain management (SCM), supply chain human performance (SCHP), human resource management (HRM) practices, quality management, resource-based view (RBV)

Introduction

The concept of supply chain management (SCM) has gained significant attention from practitioners and academics since about 2000. It is defined as “the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole” (Mentzer et al., 2001, p. 18). Scholars in discipline, such as logistics, marketing, and operations management have investigated and supported the importance of SCM in today’s ever-changing world. Much has been written from the SCM perspective on many aspects of operations and manufacturing process management (e.g., Derrouiche et al., 2008; Pirard et al., 2008). In particular, operations management researchers have studied the relationship between quality management and SCM. For example, Beamon and Ware (1998) developed a process quality model for the analysis, improvement, and control of supply chain systems. Forker et al. (1997), Matthews (2006), and Brah and Lim (2006) studied the use of total quality management (TQM) to improve supply chain performance. Watkins (2005) and Braglia and Petroni (2000) investigated the role of quality and quality assurance in selecting suppliers. Tapiero and Kogan (2007) used game theory to provide a quantitative and comparative economic and risk approach to strategic quality control in a supply chain consisting of one supplier and one producer. However, our extensive literature review revealed a significant research gap regarding human performance within supply chains. In fact, to our knowledge, there...
have not been studies formally emphasizing the concept and importance of supply chain human performance (SCHP). Consequently, little has been done from a human resource management perspective to address the approaches to achieving superior human performance. Although there is an emerging research stream dealing with the human resource management in the supply chain area (e.g., Gowen & Tallon, 2003; Richey et al., 2011), these studies did not explicitly connect human resource management with SCHP and often did not provide detailed discussion on specific and relevant human resource management practices. For example, Richey et al. (2011) provided a detailed list of important traits of global supply chain managers but little was discussed about how to develop these characteristics.

The apparent lack of concern in the literature with the performance of humans is rather perplexing and perhaps has its root in Juran’s assertion that 80% of quality problems are management controllable and only 20% are worker controllable (Juran & Gryna, 1980). Although it is important to develop viable SCM strategies and plans, their execution is dependent on the employees who are involved. Also, it must be recognized that there are individual performance variances among a firm’s employees. People are strategically important to a firm’s success (Wright et al., 2001). Therefore, successful SCM implementation requires effective management of related human resources and superior performance of employees. The current study was undertaken to address this significant research gap. It emphasizes the critical importance of human performance and it proposes a conceptual model to delineate how human performance affects SCM. Based on this model, we provide detailed discussion on how to better manage human resources in the supply chain and achieve excellent SCHP.

**Human performance**

In the supply chain context, human performance refers to employees’ performance excellence in meeting expected levels, or performance goals, on various SCM-related tasks and activities. This concept was developed first in a more general context by Swart and Duncan (2005), who specified that the expected performance in the workplace by employees is generally dictated by a set of valid and appropriate expectations and is attained through proper education and training. When actual workplace performance adheres consistently to behavioral expectations, then excellent human performance is achieved. When human performance deviates from expected performance, then the performance discrepancy must be investigated, causes identified, and appropriate corrective action taken. The definition of human performance distinguishes between situations in which an individual may not be performing adequately due to a lack of skill and when there is a lack of adequate performance due to inadequate compliance with known procedures (Karoly, 1993).

**A firm may have sound supply chain strategies in place but suboptimal performance from its employees can easily sabotage the achievement of goals**

Much has been written on how supply chain strategies and plans should be developed to enhance firm performance (Arthur, 1994; Dyer & Nobeoka, 2000; Fröhlich & Westbrook, 2001; Hunter et al., 1996). More particularly, researchers in the operations and manufacturing field have focused mainly on coming up with models, heuristics, and ideas to better manage different business processes. According to Arthur (1994), employees are key to the execution of supply chain initiatives, and managing human assets effectively by emphasizing commitment can be instrumental in improving firm performance. Therefore, human performance becomes a critical research topic. Dyer and Nobeoka (2000) argued for the importance of the development of employee commitment, and they went on to propose a relational view of networking to promote efficiency and a competitive edge. Through networking, there is a positive transfer of explicit and tacit knowledge. Hunter et al. (1996) stressed the development of inter-firm collaborative relationships involving the customer organization and one or more supplier organizations. The focus of their model emphasizes joint development activities, effective communication among all parties, participation in joint cross-functional teams, and the sharing of a common approach to problem identification and solution. A further development in the modeling of supply chains is the arc of integration as proposed by Fröhlich and Westbrook (2001). Their model expands on the concept of a supply chain to include a strong integrative process among upstream and downstream firms. They proposed five distinctive operationalizing arcs of supply chain integration: inward-facing, periphery-facing, supplier-facing, customer-facing, and outward-facing. What is common in these models, but is not fully addressed, is the human performance component in the supply chain strategy because they all assume the ideal performance from employees.

Human failure to deliver ideal performance does occur and may result in a breakdown in the quality of goods and services. The conventional wisdom is that appropriate training will create
ideal performance. However, accounts of failure by employees to perform according to the standards to which they have been educated and trained abound. Frequently, attempts at training have met with limited success leaving major gaps between the standards to which employees have been trained and their actual performance (Selby-Lucas et al., 2002; Swart et al., 1997). Concerns regarding professionalism or work ethic have also been expressed among employers. Casner-Lotto and Barrington (2006) reported that almost one-third of employer respondents cite professionalism and work ethic as a major deficiency in recent two and four-year college graduates. Problems with the quality of performance appear to permeate a wide array of situations.

Human performance is crucial to supply chain strategy implementation. A firm may have sound supply chain strategies in place but suboptimal performance from its employees can easily sabotage the achievement of goals. For example, a firm may have developed a comprehensive process for quality control in its manufacturing processes to meet customer requirements. However, if the employees involved in related activities cannot or choose not to perform as trained, desired service levels or product quality standards may still be in danger. Therefore, it is important to realize that SCM is not only about strategy development, process design, or hardware upgrades, but it is also about the effective management of human performance.

The resource-based view of the firm (RBV) provides a suitable theoretical lens to look at human performance. RBV originated in the management field and emphasizes the importance of resources in relation to a firm’s competitive position (Penrose, 1959). Barney (1986, 1991) elaborated on the importance of resources by noting that a firm’s performance is driven directly by its products and indirectly by the resources that go into their production. Resources generally have been defined as the assets, processes, information, skills, knowledge, and so on of a firm to develop distinctive capabilities and use them to achieve competitive advantages (Amit & Schoemaker, 1993; Barney, 1991; Grant, 1991). According to Barney (1991), a strategic resource has four qualities:

- **Value:** The resource can produce something that is valued by consumers.
- **Rarity:** The resource must be limited in supply.
- **Inimitability:** The resource must be difficult for other firms to imitate.
- **Non-substitutability:** The resource must have few close substitutes.

Strategic management theorists have suggested that organizational assets such as employee skills can be classified as core resources that are vital to the competitive advantage of an organization (Barney, 1991; Lepak & Snell, 1999; Porter, 1985). In the SCM context, human performance of a firm’s employees can add value by helping the firm improve supply chain efficiency and effectiveness. Consequently, human performance is a valuable resource because it enables a firm to enact supply chain–related strategies. Also, human performance and the resource management practices that facilitate it (or not) are idiosyncratic resources and specific to a firm (see Lepak & Snell, 1999; Mosakowski, 1991; Walker & Weber, 1984). SCM often involves cross-functional teams and unique operational procedures and processes. Achieving superior human performance in these supply chain activities requires the development of tacit knowledge, which will enhance the uniqueness of a firm’s human capital. Obtaining this knowledge and skill often involves idiosyncratic learning processes, and firms are not likely to find them in the open market (Lepak & Snell, 1999). Therefore, human performance is a unique resource. SCM’s boundary-spanning nature determines that human performance in a supply chain context possesses the characteristics of social complexity.

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**Figure 1**
The SCHP Model

- **HRM Practices**
- **SC Strategy Implementation**
  - Process Management
  - Relationship Management
  - Continuous Improvement

- **Overall SC Performance**
  - SC Effectiveness
  - SC Efficiency
and causal ambiguity. Because of all the complementarities and interdependencies among the set of supply chain human resource management practices, it is very difficult for other firms to duplicate or imitate (Lepak & Snell, 1999; Wright et al., 2001). Finally, SCHP is not a resource that can be substituted easily. Even the highest levels of automation rely on human performance to function. People are strategically important to a firm’s success, including supply chain performance. Therefore, we can argue that a firm’s SCHP is a critical strategic resource that firms should actively manage.

Human performance and supply chain strategy implementation

In order to discuss human performance and its importance in supply chain strategy implementation in detail, we propose the conceptual model of supply chain human performance (SCHP) shown in Figure 1. In subsequent sections of this article, we will discuss the human resource management (HRM) practices that facilitate the achievement of superior SCHP.

Although supply chain strategy can manifest itself in many different types and forms, our literature review suggests that most strategies fall into three major categories: process management, relationship management, and continuous improvement. We next discuss how human performance integrates with each of these categories.

Human performance and supply chain process management

Process management is key to successful SCM (Lambert, 2004). Whereas SCM involves numerous business processes, the Supply Chain Council’s Supply Chain Operations Reference (SCOR) model (see www.supply-chain.org), shown in Figure 2, concisely summarizes all supply chain processes into five key activities: plan, source, make, deliver, and return. We argue that SCHP has significant influences on the effective management of these five activities.

Plan. Demand and supply planning and management are included in this first step. Elements include balancing resources with requirements and determining communication along the entire chain. The plan also includes determining business rules to improve and measure supply chain efficiency. These business rules span inventory, transportation, assets, and regulatory compliance, among other functions. The plan also aligns the supply chain plan with the financial plan of the company (see www.supply-chain.org). During the planning process, it is necessary to take human performance issues into consideration. Ignoring the reality of human performance in a particular company will result in unrealistic planning for supply chain initiatives. In other words, supply chain planning should be based on employees’ knowledge, skills, experience, and work ethic. If there is a gap between the developed plan and the realistic human performance of employees, it is almost certain that the supply chain plan will fall short of its expected goals.

Source. This step describes sourcing infrastructure and material acquisition and how to manage inventories, the supplier network, supplier agreements, and supplier performance. It discusses how to handle supplier payments and when to receive, verify, and transfer product (see www.supply-chain.org). Although it is important for a firm to have a sound sourcing strategy, it is equally important to have capable employees to ensure the procured materials meet requirements in quality, quantity, and delivery time. In addition to the quality control aspect of human performance, sourcing employees’ ability to maintain ideal relationships with different suppliers is also a key consideration. The communication skills and relationship-building...
capability of a company’s sourcing employees are crucial to securing reliable and long-lasting supply sources.

**Make.** Manufacturing and production are the emphasis of this step. Manufacturing processes can be make-to-order, make-to-stock, or engineer-to-order. The make step includes production activities, packaging, staging product, and releasing. It also includes managing the production network, equipment and facilities, and transportation (see www.supply-chain.org). Again, all the involved activities in these processes are performed by human beings – even the most advanced machinery and equipment are ultimately developed and controlled by humans. Human factors play a critical role and are prone to error particularly at the linkages between different manufacturing processes. Therefore, a lack of focus on human performance can result in suboptimal production and even cause catastrophic occurrences. Consider, for example, that the Saturday, March 1, 2008, issue of the Florida Today newspaper reported that by not following proper procedure a Florida Power and Light (FPL) engineer was the sole cause of a massive power outage that left millions without electricity throughout the state for a several hours. The report continued by stating that FPL president Armando Olivera said a preliminary investigation found that not one customer would have lost power had proper procedure been followed. The engineer disabled two levels of relay protection while diagnosing a piece of malfunctioning equipment. Under standard performance procedures one relay is disabled but never two according to Olivera. It was not known why the employee took it on himself to disable both relays.

**Deliver.** Delivery includes order management, warehousing, and transportation. It also includes receiving orders from customers and invoicing them once a product has been received. This step involves management of finished inventories, assets, transportation, product life cycles, and importing and exporting requirements (see www.supply-chain.org). Oftentimes, this is the activity in which a firm’s supply chain directly interacts with its customers. On-time, consistent deliveries are largely dependent on employees’ ability to meet expected objectives. Therefore, excellent customer service can be provided only with capable and dedicated employees educated and trained to deliver ideal performance.

**Return.** Firms must be prepared to handle the return of containers, packaging, or defective products. The return involves the management of business rules, return inventory, assets, transportation, and regulatory requirements (see www.supply-chain.org). Compared to forward logistics, reverse logistics can be more challenging to manage because of its uncertainty (Rogers & Tibben-Lembke, 1999). The uncertainties related to reverse logistics include returned products’ quantity, condition, timing, disposal approaches, and so on. Therefore, return management requires highly skillful, experienced, and knowledgeable employees to make sound decisions and take the most appropriate actions. In other words, satisfactory human performance is critical to returns management.

In fact, the importance of human issues is already recognized by the Supply Chain Council in its latest version of SCOR model. People are emphasized as a critical factor to support a SCOR project. According to the Supply Chain Council, the people factor includes skills, experiences, aptitudes, and training; and skills are defined by the other three factors. This is a solid justification of our argument that human performance has significant influence on supply chain process management. In this article, we further argue the importance of human performance to other SCM aspects, such as relationship management and continuous improvement in addition to process management.

**Human performance and supply chain relationship management**

As indicated in all the different conceptualizations, SCM involves coordination, cooperation, and collaboration among different supply chain members within and across firms (Dyer & Nobeoka, 2000; Hunter et al., 1996; Mentzer et al., 2001). Therefore, relationship management is an integral part of SCM, and internal and external collaboration remains a continual topic of interest in the SCM field (Fröhlich & Westbrook, 2001; Min et al., 2005).

Supply chain relationships exist at different interfaces and at different levels and fall into three categories: customer relationships, supplier relationships, and cross-functional relationships (see Bowersox et al., 1999). Effective management of these relationships can be an extremely valuable resource for a firm and can contribute to the firm’s competitive advantages (Barney, 1991). The manner in which firms manage relationships is part of the corporate culture and thus difficult to imitate.

All relationships are among humans. Therefore, capable and committed employees are the key in relationship management (Arthur, 1994). There are concrete “hard” measures to gauge certain human performance aspects related to specific supply chain goals in order to ensure collaborative supply chain relationships, such as meeting the requirements of quality, quantity, or delivery time. It is also important to realize the intangible aspect of human performance. For example, even if a firm can successfully meet customers’ requirements in product quality, its customers may not be fully satisfied if the firm’s employees do not have the right attitude while providing services. Therefore, the “soft” side of human performance is also important and deserves careful attention. More specifically, a firm’s HR practices should be adapted to its supply chain relationships (Hunter et al., 1996; Scarbrough, 2000; Swart & Kinnie, 2003).
Human performance and supply chain continuous improvement

Recent RBV literature has started to emphasize a dynamic view. As Helfat and Peteraf (2003) argued, competitive advantage and disadvantage comes about over a period of time and also may shift over time. Therefore, it is crucial to adopt a dynamic view of RBV and firms should focus on developing dynamic capabilities, which refers to “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece et al., 1997, p. 516).

In today’s dynamic market environment, firms can succeed only by regularly adjusting and adapting their operational processes in response to and in anticipation of new market conditions and customer requirements (see Flint & Mentzer, 2000; Fröhlich & Westbrook, 2001). At the same time, firms should also look constantly for ways to improve their efficiency. Consequently, any firm that desires to succeed in the long run must be willing and able to make continuous improvements. In order to facilitate these continuous improvements, firms must engage in ongoing organizational learning. This explains why RBV scholars (e.g., Zollo & Winter, 2002) have explicitly connected organizational learning with dynamic capabilities.

Since the 1990s, organizational learning has been widely studied in marketing and strategic management. As market demand has become “significantly heterogeneous and dynamic” (Hunt & Morgan, 1995, p. 5), knowledge has become the most strategically significant resource of a firm (Grant, 1996). A firm should not only learn internally but also externally through customers, distributors, suppliers, and others (Achrol, 1991; Dickson, 1992; Fröhlich & Westbrook, 2001; Slater & Narver, 1995). According to Garvin (1993), a learning organization is “an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights” (p. 80). Sinkula (1994) conceptualized organizational learning process into four different phases: information acquisition, information dissemination, information interpretation, and knowledge storage and utilization.

Any organizational learning starts at the individual level. It is the employees who are actually engaged in the learning activities. Therefore, another respect of human performance is the orientation of a firm’s employees toward continuous learning that underlies continuous improvements in SCM. Companies must realize the value of creating and managing a high performance knowledge-sharing network (Dyer & Nobeoka, 2000), which provides an effective platform for employees to participate in desired learning activities and achieving and sustaining a high level of performance in the long run.

A key focus of the RBV literature is to determine what makes a resource inimitable. There are four sources of inimitability cited in the literature:

- Causal ambiguity: It is neither possible for outsiders to understand how the intangible assets have been built nor how they contribute to value creation (Diericks & Cool, 1989; Reed & DeFilippi, 1990).
- History: Firms evolve via a path dependency that is hard to replicate.
- Social complexity: Firms are social organizations and the informal social interactions that occur between resources in a firm are hard to replicate without detailed insider knowledge (Barney, 1986; Nelson & Winter, 1982).
- Time compression diseconomies: It takes time to learn firm knowledge through experience or to train workers in a skill, which can confer competitive advantages; Wernerfelt (1984) refers to this as the “experience curve.”

Our discussion of supply chain human performance suggests that it meets all four inimitability requirements. Therefore, we argue that human performance is a critical strategic resource that has important implications for effective supply chain strategy implementation.

Supply chain strategy implementation and overall supply chain performance

Although the relationship between supply chain strategy implementation and supply chain performance is not the focus of the current study, this link is still discussed here to demonstrate the indirect influences of human performance on overall supply chain performance.

Supply chain performance is a comprehensive concept and encompasses many subdimensions. However, a widely accepted typology is performance related to efficiency and effectiveness. Efficiency refers to a firm’s ability to use resources (i.e., minimize costs), whereas effectiveness is a firm’s ability to fulfill customer requirements (i.e., enhance customer service) (Mentzer, 1993). Ultimately, successful SCM strives to achieve efficiency and effectiveness. Although it can be expected that effective supply chain strategy implementation will result in improved efficiency and effectiveness, it can also be argued that human performance must implement those strategies that create effectiveness and efficiency and hence have a major influence on overall supply chain performance.

Achieving and maintaining SCHP

Having discussed the importance of human performance in SCM, the remaining question is how to achieve and maintain ideal SCHP. Here, we argue that developing a high level of human performance is not a task of any single department or functional area, such as human resource (HR), production, or logistics departments; instead, this should be a systematic effort across all parties involved in today’s supply chains. Just like Mentzer et al. (2001) proposed that
SCM needs a holistic view across supply chains, managing SCHP should also take a collective view and approach that should include external educational institutions such as schools, colleges, and universities, as well as internal HRM practices.

Educational institutions

The external educational environment may be something that no single firm has the ability to change immediately but firms can still make contributions to improve it. For example, although major sources of SCM professionals are schools, colleges, and universities, the Association to Advance Collegiate Schools of Business (AACSB) reports that there only are 50 out of its 500 accredited US business programs that offer degrees in SCM or logistics. Capable firms can and should make efforts to persuade investments from the public and private sectors that will benefit SCM education. Firms can support SCM programs by providing necessary funding and other types of assistance. In fact, many firms that are successful in SCM have already established collaborative partnerships with different universities and colleges. In the short run, these types of partnerships can help the firm secure ideal graduates. In the long run, it will help improve the visibility of the company and the SCM profession.

HRM practices for achieving supply chain human performance

Although external factors are relatively difficult for a firm to control, it might be more worthwhile for firms to focus their efforts on improving internal areas that are under their direct control because these efforts can have immediate ramifications on a firm’s SCHP enhancements. As indicated in the conceptual model, we argue that HRM practices directly affect supply chain human performance. Achieving superior SCHP demands a unique set of behaviors and attitudes from employees, and certain HRM practices produce a unique set of responses from employees (see Cappelli & Singh, 1992; Wright et al., 2001). More specifically, Lepak and Snell (1999) and Wright et al. (2001) argued that valuable and unique employee skills are associated with different types of HRM practices. Therefore, it is necessary and meaningful to discuss various HRM practices that are the drivers of SCHP.

Koulikoff-Souviron and Harrison (2007) used a seven-dimension structure to study HRM practices in an SCM relationship context that is applicable to the current research. Further, it also aligns well with Swart and Duncan’s (2005) discussion on improving human performance. Therefore, we adapted their structure to the following discussion of how an internal HR organization can proactively help to achieve ideal human performance:

1. Staffing. This is the process of selecting and assigning appropriate persons to specific supply chain–related positions. HR departments play a critical role in recruiting capable talents, and they are also often charged with the development or procurement of training programs to prepare recruits for the specific jobs in their organization. As Snow et al. (1992) pointed out, the twenty-first century requires companies to develop a smaller, better trained workforce that is capable of using emerging global technological resources. Today’s firms also face the challenge of retaining capable employees. A high turnover of employees will not only result in the deterioration of human performance but also cause significant loss of investment in seasoned supply chain professionals (Arthur, 1994). Furthermore, when an employee is replaced with a new and untrained employee, the entire problem perpetuates itself.

2. Job and process design. This refers to the process of combining tasks and responsibilities to form jobs and the relationships between jobs. This is an important area that is closely related to supply chain human performance because there are many factors to consider. Decisions such as whether to make the job simple or complex, whether to make it a single-person job or a team job, how to design the workplace, what are the interfaces between different jobs, and so on all have implications for SCHP (Pagell, 2004; Storey & Harrison, 1999; Swart & Duncan, 2005). An effective organizational structure is also related to job and process design and should be in place to ensure human performance (Pagell, 2004). Selby-Lucas (2002) show that the degradation of quality human performance can occur from top-down disconnections when upper and middle management fail to enforce standards. When this occurs, employees are given the message that doing a job to standards is not a requirement. Or, it may be a bottom-up issue when employees press for negotiation of standards of quality. They emphasize the importance of having the goals at the various levels of the organization aligned to achieving quality human performance.

3. Appraisal and evaluation. This refers to the formal and informal system that monitors employees’ performance related to SCM. Swart and Duncan (2005) explicitly emphasized the measurement of human performance, which helps identify performance discrepancy between actual performance and expected performance, to enable continuous improvement in human performance. Selecting suitable measurement items is critical for successful appraisal because of the following reasons:

- People usually will work hard on what is being measured. In other words, the chosen measurement scale will drive people’s behavior.
- SCM’s boundary-spanning nature determines that SCM-related measurement should be aligned
across different functional areas. Otherwise, even if each individual area can obtain excellent performance but conflicting actions could occur and result in poor overall supply chain performance.

4. Rewards. This refers to the system in which a firm provides exchange for its employees’ contribution (Koulikoff-Souviron & Harrison, 2007; Pagell, 2004). Swart and Duncan (2005) suggested the importance of motivating employees to ensure superior human performance. When the reward system can be perfectly aligned with a firm’s appraisal and evaluation, it can become an effective motivation method. For example, cross-functional teams are a widely used SCM practice (Pagell, 2004). If a reward system is designed to emphasize the cross-functional team’s performance but not an individual department or an individual employee, it can be expected that the team members will strive for the success of the team – which is crucial to successful SCM.

5. Training. As Swart and Duncan (2005) suggested, various training programs directly help improve a firm’s SCHP because better output can be expected if related employees possess better knowledge. SCM has its unique boundary-spanning feature and requires a very good understanding of the firm’s entire supply chain process. Therefore, fostering a holistic view of the supply chain is a primary goal for any SCM-related training. Employee training can either be provided in-house or outsourced to external organizations (such as universities or other certification agencies). These training programs educate employees on necessary knowledge and skills so they can perform assigned supply chain tasks to specified standards. In addition, in trying to understand when and why these quality issues occur, it can become readily apparent that there may be major differences in training (lack of knowledge about quality performance). But, the primary issue revolves around a very different cultural vision of quality. “Minor” issues (i.e., one table leg shorter than another, defective shock absorbers on a car) are “no big deal” in the daily life of the indigenous workers and these perceptions negatively influence their overall concept of quality even when training to standard has occurred.

SCM training should also pay attention to fostering employee self-regulation. Once training to a pre-set level of competency has been provided, the issue becomes one of applying self-regulation to attain quality human performance. The term self-regulation has been used interchangeably with other terms depending on the focus and discipline (Hoyle, 2006). In sociology and psychology, it has often been interchangeable with self-control. In educational psychology, it often refers to self-regulated learning. In systems theory, it can reflect homeostasis. Karoly (1993) defined self-regulation as internal and transactional processes that serve to guide goal activities; this is the definition used in this article. Karoly goes on to note that parts of this process of self-regulation include discrepancy detection and implementation, self-evaluation, self-efficacy, meta-skills, boundary conditions, and self-regulation failure. Therefore, SCM training should emphasize the development of supply chain professionals’ self-regulation to achieve the maximum quality performance.

6. Socialization. This is the process in which managers and employees interact at their workplace. Lack of socialization has been identified as a key issue in many SCM practices (Koulikoff-Souviron & Harrison, 2007). Although today’s technologies provide a wide range of media in terms of socialization, face-to-face interaction is still critical and cannot be totally replaced (Letmathe et al., 2012). Effective socialization offers opportunities for employees to share work-related experience, knowledge, concerns, questions, and solutions and help foster a holistic view of the entire supply chain. Therefore, a firm that strives for supply chain excellence should make efforts to provide the most suitable platform to foster desired socialization. As Dyer and Noboeka (2000) reported, Toyota developed a variety of bilateral and multilateral processes to facilitate knowledge sharing within its network. For example, the supplier association allows individual members to develop embedded ties with those other members who have particularly relevant knowledge.

It is also necessary to realize that many of today’s supply chains expand across different regions and countries. Therefore, cultural variations may negatively affect SCHP. The concept and awareness of quality varies from country to country and culture to culture and further complicates the training process. It may be very difficult for employees to understand why standards should be followed methodically if these standards are atypical to their everyday lives. Therefore, it is a firm’s responsibility to provide a platform and let employees be aware of and overcome these differences.

7. Communication. According to Koulikoff-Souviron and Harrison (2007), communication refers to the provision of information to employees concerning aspects of their employment and wide issues related to the organization. SCM-related jobs are often fast-paced and ever-changing. It is not uncommon for SCM employees to work under great pressure. Also, most SCM-related strategy implementation involves changes to current practices, which can create negative feelings among employees (Storey & Harrison, 1999). Therefore, the communication between a firm and its employees can help mitigate this issue and facilitate smooth transformation.
Research opportunities and agenda related to human performance in SCM

In addition to the previous discussion from a managerial perspective, an important goal of the current study is to identify research opportunities related to human performance in SCM. We believe the opportunities in further studying this topic are abundant and we discuss some in the next paragraphs.

Future research on conceptualization of SCHP

This article introduces the SCHP construct as shown in Figure 1. Although we believe our study will draw scholars’ attention to this important concept, we also realize that the construct of SCHP is comprehensive and requires much more in-depth research to enable us to fully understand its meaning.

SCHP is a general concept. It encompasses many different functional areas within and across firms. In other words, this construct may embody different specific meanings in different contexts – although its underlying essence remains the same as shown in the current study. Therefore, we call for more research on exploring of specific meanings and possible subdimensions of this construct in different scenarios. Efforts can be made to identify the common places and situation-specific characteristics.

Future research on human performance and other concepts

Besides empirically conceptualizing SCHP, future research should also explore and identify potential antecedents of SCHP. Although the current study does provide preliminary discussion on some measures to improve human performance, further conceptual and empirical study is warranted.

The current study suggests a conceptual model on human performance’s influences on supply chain strategy implementation and overall supply chain performance. It also provides a rationale for the suggested links. However, these relationships must be subject to future research testing through empirical data collection and analysis. Based on analysis results, the relationships proposed in the current study may be validated, rejected, or revised. Furthermore, additional links may be identified through future empirical studies. Also, our discussion in the current study is limited to the implementation of major categories of supply chain strategies. We encourage future research on the impact of human performance on different specific supply chain strategy implementations, such as quality management and inventory management. Although some common patterns are expected, we also believe that distinctive influences of human performance can be identified.

As previously discussed, cultural difference has become a relevant topic in SCHP research due to the increasing international nature of today’s supply chains. Without a clear understanding of the cultural differences embedded in supply chain operations, firms’ efforts on improving supply chain performance may be sabotaged. Unfortunately, little research has been done in this aspect. Therefore, it is imperative for future research to look into culture differences in order to ensure that ideal human performance is maintained across national and international borders.

Conclusion

As the first study to emphasize the importance of SCHP, this article provides the initial conceptualization of the construct and proposes its important influences on supply chain strategy implementation. We hope our study can help managers better understand and develop effective SCM practices revolving around human performance. We suggest that future SCM research should incorporate human performance as an important construct.

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