

## **Abstract**

CORPENING, JAMES LOUIS, JR. Examination of the Interaction of Team Learning Variables Within a Systems Focus on Organizational Learning and the Learning Organization: A Study of a Nursing Team at a Large Southeastern Teaching Hospital. (Under the direction of John Pettitt and Tony O'Driscoll.)

The purpose of this study is twofold. First, this study takes an exploratory approach into examining the interaction of the team learning variables contained in the Team Learning Survey developed by Dechant and Marsick (1993). The interaction of the variables was examined to give further insight into whether the variables individually, or in combination, add to the empirical base of understanding team learning theory. Secondly, this study employs an already established work team and analyzes whether the team learning variables are applicable to work and demographic variables (ethnicity, gender, salary, age, professional degree, work status, and nursing longevity). The team selected for analysis is nurses at ABC Hospital (pseudonym). This team was chosen because teamwork is fundamental to their work product, and they rely upon the knowledge of one another to provide care for patients.

A multiple regression procedure was used to examine the interaction of five team learning variables: 1) team learning processes, 2) team learning conditions, 3) team learning outcomes, 4) organizational learning conditions, and 5) organizational learning contributions. A regression model indicated team learning processes, team learning conditions, and organizational learning contributions predict team learning outcomes. The model was able to explain 73 percent of the sample variation in team learning outcomes. However, the team learning processes variable alone explains 70 percent of the 73 percent sample variation.

Additional analysis was conducted with respect to the team learning variables. ANOVA and Tukey procedures were used to determine if the team learning variables differ by ethnicity, gender, full- vs. part-time work status, age and salary. At a .05 level of

significance, Asians scored higher than Caucasians on team learning conditions and African-Americans scored higher than Caucasians on organizational learning contributions.

Spearman correlation was used to determine if a relationship exists among the team learning variables and demographic variables (nursing longevity, salary, and age). At a .05 level of significance, the team learning variables showed no relationship with the demographic variables.

**EXAMINATION OF THE INTERACTION OF TEAM LEARNING VARIABLES  
WITHIN A SYSTEMS FOCUS ON  
ORGANIZATIONAL LEARNING AND THE LEARNING ORGANIZATION:  
A STUDY OF A NURSING TEAM AT A LARGE  
SOUTHEASTERN TEACHING HOSPITAL**

by

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## **Biography**

James Louis Corpening, Jr. was born February 8, 1967, to the marital union of James and Mildred Corpening. In 1989, James earned a Bachelor of Science degree in Criminal Justice from the University of North Carolina at Charlotte. Following graduation, he became employed with the North Carolina Department of Correction in the capacity of a Probation/Parole Officer. While working full-time, he attended graduate school at North Carolina Agricultural and Technical State University in Greensboro, NC. In 1991, he earned a Master of Science degree in Educational Development and Leadership Policy (Adult Education).

In 1992, James secured employment as a United States Probation Officer in the Eastern District of North Carolina. In 1998, he was promoted to Senior United States Probation Officer (Program Development Coordinator) and presently maintains that position. As Program Development Coordinator, James developed a keen interest in leadership, organizational development, and the importance of teamwork in organizational effectiveness. From that interest, his academic pursuits solidified a deeper interest in organizational learning, the learning organization, and ultimately, team learning.

James is married to Felice McConnell Corpening and they have one daughter, Taylor Nicole.

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## **Chapter One**

### **Introduction**

Today's workforce is changing by leaps and bounds. The pace of change has been accelerated by widespread advances in information and technology (Brown, 2000; Mariotti, 1999; O'Brien and Buono, 1999; O'Driscoll, 1999; Senge, 1999). As a result, organizations must adapt to global competition while simultaneously attempting to maintain or improve quality services and products. A core requirement of the information age organization is developing the capability to sense and adapt to new conditions. To facilitate change, organizations are focusing on learning, especially team learning.

Literature refers to the "focus on learning" as organizational learning (Boud & Garrick, 1999; Gilley & Maycunich, 2000; Kim, 1993). Organizational learning is a conduit for learning organizations, a paradigm that focuses on the mutual development, growth, effectiveness and efficiency of the individual as well as the organization. Organizations are adhering to the principles of the learning organization by strategically planning their futures with a focus on teams. Consequently, at the root of organizational learning and the culture of the learning organization is the concept of team learning.

Team learning is the process by which a group creates knowledge for its members, itself as a system, and for others (Dechant & Marsick, 1993). It is about learning individually and collectively, and sharing what is learned throughout the organization. Moreover, team learning involves collaboration between team members to enhance individual and collective performance through a systems paradigm.

Dechant and Marsick (1993) developed a model that qualitatively analyzed the key components of team learning. This study used Dechant and Marsick's model to investigate the extent to which team learning exists within the nursing profession at a private hospital. This chapter provides the background, central problem, purpose, and significance of the study. The research questions are introduced and are followed by definitions of terms applicable to this study.

### ***Background***

The United States is experiencing a serious epidemic involving the need for quality health care. The numbers of uninsured people are increasing exponentially (Boyd, 1996; Cassil, 1997; Healthcare Financial Management, 2003). For those who are insured, the cost of medical insurance is becoming more expensive. The health care industry is evaluating such issues while experiencing change itself. The industry is undergoing significant and continual change as technology advances and medical research reveals improved methods for providing care. As technology and research expand, the costs of health care increase. Increased costs have changed the focus of health care delivery. To minimize costs, health care organizations are moving from individual to team approaches while maintaining a commitment to providing quality health care. Such a focus relies on learning, intellectual capital, and sharing information to provide even better patient care.

ABC Hospital (pseudonym), a private institution, has been providing health care services for more than sixty years. The hospital, or its specialized services, have been annually recognized among the top 50 in America (Duffy, 2001; Duffy, 2002; Smith, 1998; Smith, 1999; Smith, 2000; Wright & Sunshine, 1995). The hospital's use of nursing teams is key to its effectiveness, and the manner in which the teams learn and share knowledge within the

organizational culture is crucial to organizational and team learning. Senge (1990) is quite adamant about the significance of team learning:

Team learning is vital because teams, not individuals, are the fundamental learning unit in modern organizations. This is where ‘the rubber meets the road’; unless teams can learn, the organization cannot learn. (p.10)

Senge’s concept of team learning also recognizes that collective intelligence is significantly expanded by the intelligence of individuals. Yet, team learning is predicated on the existence of organizational learning. Moreover, team learning emphasizes the collective acquisition of knowledge and how that knowledge is accepted and incorporated by the organization.

### ***Problem Statement***

Existing literature, while addressing issues related to group dynamics and instructional delivery, does not provide adequate information on team learning. Group theory literature focuses on members’ roles and responsibilities (Schein, 1986) and conflicts (Johnson & Johnson, 2000). Problem solving, decision making, and intergroup relations represent other commonly addressed themes (French & Bell, 1999). Adult education literature is concerned with growth, learning, and development (Brookfield, 1986; Knowles, 1980; Jarvis, 1987) within individual group members (Dechant, Marsick, and Kasl, 1993). Educational research tends to focus on the learning that occurs among individuals through various forms of group instruction such as discussion groups, action learning, the Socratic method, and guided discussion.

In fact, researchers investigate developmental stages, processes, trust, productivity, goal attainment, norms, communication, and diversity within teams (Johnson & Johnson, 2000)

without mentioning team learning. Also not mentioned is the team learning goal of promoting individual and collective knowledge. Moreover, although the concept of team learning appears to be a natural process to accommodate efficiency, there has been minimal formal research into the landscape of how teams learn. Although there is a plethora of theoretical research on organizational learning (Argyris & Schön, 1979; Bould & Garrick, 1999; Harshman & Phillips, 1994; Hedberg, 1991; Moingeon & Edmondson, 1996; Rolls, 1995; Shaw, 1991) and learning organizations (Easterby-Smith, Arajoo, & Burgoyne, 1999; Garvin, 1994; Ellinger, Watkins & Bostrom, 1999; Gephart, Marsick, Van Buren, & Spiro, 1996; Harris & Gokcekus, 2000; Karash, 1997; King, 2001; Marquardt, 1996; Nayak et al., 1995; Rolls, 1995; Senge, 1990), the literature on team learning is still limited.

In one of the few studies of team learning, Dechant and Marsick (1993) found that collectively shared learning seems to result in learning and change within organizations. Further studies by these researchers focused on learning that occurred in teams, and how that learning related to individual and organizational learning. They studied two companies, a manufacturing and a petrochemical company, to determine how groups learn. They identified distinctive team learning processes, conditions, and outcomes that occur when teams work on tasks or projects. They also identified organizational learning contributions and conditions that determine the extent to which learning is accepted by the organization. From their research, Dechant and Marsick (1993) developed a Team Learning Model and ultimately the Team Learning Survey, which determines how well a team learns as a group. The survey contains five key components of team learning: 1) team learning processes, 2) team learning conditions, 3) team learning outcomes, 4) organizational learning contributions, and 5) organizational learning conditions.

Brooks (1994) studied team learning in a high technology company while Rogers (2002) studied team learning in a communications company. Both their findings support the Team Learning Model developed by Dechant and Marsick (1993). Gavan (1996) used the research of Dechant and Marsick (1993) to examine team learning in a home health care setting and her findings also support the model. The processes and conditions variables of the Team Learning Model were supported when John (1995) applied them in a professional services company. John did not consider team learning outcomes that measure how well a team learned.

The literature to date has written prescriptions for improving organizational effectiveness. However, the literature has failed to go beyond the anecdotal remedies of understanding how teams capitalize on the collective acquisition of knowledge while conserving resources and providing exceptional services. Moreover, most research fails to link the findings of studies or group methods, or both, to outcomes, processes, contributions, or conditions of team learning. This study furthers the research of Marsick and Dechant (1991) and Gavan (1996). It links team learning to the organizational learning theory and learning organization theory. This study does so by examining the interaction of the team learning variables to determine if the variables individually, or in combination, add to the understanding of team learning theory.

### ***Purpose of Study***

Team learning appears to be the optimal opportunity for organizations to gain a productive, self-sustaining momentum for improving organizational effectiveness.

Although teams are respected for influencing the learning process (Brookfield, 1986, 1987; Knowles, 1980, 1984) and individuals' work within the group (Mezirow, 1991; Pedler,

Burgoyne, & Boydell, 1997; Rolls, 1995; Watkins & Marsick, 1993), they are not as well known for being primary learning infrastructures. To obtain more insight into a team as a learning infrastructure, other studies have investigated the five team learning variables researched by Dechant et al. (1993). However, those studies have examined the team learning variables without analyzing the interaction of the variables. The five team learning variables developed by Dechant and Marsick (1993) are team learning processes, team learning conditions, team learning outcomes, organizational learning conditions and organizational learning contributions.

The purpose of this study is twofold. First, this study is unique in that it expands current research by taking an exploratory approach into examining the interaction of the team learning variables. It is important to study the interaction of the variables because it may give further insight into whether the variables individually, or in combination, add to the empirical base of understanding team learning theory. Secondly, this study takes an already established work team and analyzes whether team learning concepts are related to particular work and demographic variables (ethnicity, gender, salary, age, professional degree, work status, and nursing longevity). The team selected for analysis is nurses at ABC Hospital. This team was chosen because teamwork is fundamental to their work product, and they rely upon the knowledge of one another to provide care for patients. From this twofold purpose, the following research questions evolve:

1. What are the gender, ethnic, professional degree, nursing longevity, salary, and age characteristics of nurses at ABC Hospital?
2. Do team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions have an impact on team learning

outcomes among nurses at ABC Hospital?

3. Do team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions differ by ethnicity, gender, degree, full- vs. part-time work status, age, and salary?
4. Is there a relationship among team learning processes, team learning conditions, organizational learning contributions, and nursing longevity, salary and age?
5. Is there a relationship among organizational learning conditions, team learning outcomes, and nursing longevity, salary and age?

### ***Rationale and Significance of Study***

Primarily, this study continues existing research and theory regarding team learning. It does so by exploring whether team learning variables individually or in combination provide more understanding of team learning theory. Additionally, it contributes to existing team learning theory by examining the team learning variables with respect to particular work and demographic characteristics (ethnicity, gender, salary, age, professional degree, work status, and nursing longevity).

Secondarily, the content of this study may be useful to hospital administrators and the nursing profession. With the changing environment and advancements in technology and medical research, there exists a need to link team learning to facilitate a cohesive and collaborative work environment in the nursing industry. Learning to learn together is critical for nurses in collectively providing care for patients. As they work in teams, they are forced to rely upon one another to facilitate greater efficiency.

With a shortage of nurses in NC, the need to learn from one another becomes essential for neophyte nurses as well as for seasoned professionals. Understanding the conditions,

processes and outcomes of team learning should assist nurses and hospital administrators in identifying the strengths as well as the barriers involved in working in teams, and relying upon the knowledge of all team members. This study may also encourage the development of on-the-job training that reflects the importance of team learning. Further, hospital administrators may use the findings for developmental purposes - to enhance the positive factors and/or strengthen identified weaknesses involved in staff development programs.

### ***Limitations***

Limitations of this study stemmed from the selection process. Nurses were randomly selected to participate in the study. The pool of nurses consisted of nurses and supervisors who work in teams. Potential respondents were promised their individual responses would be kept confidential. Due to a low response rate, nursing managers were asked to encourage participation in the study by reminding survey recipients to return their surveys to the researcher, if they chose to participate. Therefore, participant bias may occur as participants may provide “favorable” responses. To guard against the potential bias, the researcher emphasized the fact that responses would be held in strict confidence, and individual responses would not be disclosed. Additionally, this study has limited generalizability. These findings cannot be applied to team learning among nurses at every private hospital. Rather, findings generalize only to nurses at ABC Hospital.

### ***Definition of Terms***

The following is a list of terms that will have special definitions in this study:

intellectual capital - knowledge and skills of individual employees. Maximizing the acquisition of knowledge and skills by sharing within the organization is a means of increasing intellectual capital (Liebowitz, 2000).

learning organization - an organization that achieves its mission by institutionalizing the acquisition of knowledge for individual, collective, and organizational growth, and shares the knowledge to modify its behavior for improved organizational results (Senge, 1990).

organizational learning - process of learning within an organization, and sharing and adopting the learned knowledge to reach maximum organizational effectiveness (Moingeon and Edmondson, 1996; Senge, 1990).

organizational learning conditions - the conditions or factors which influence the operation of teams and determine the extent to which the outcome of a team's work is incorporated into the organization's functioning and processing (Dechant, Marsick, & Kasl, 1993).

organizational learning contributions – the extent to which the outcome of a team's work is shared inside and outside the team, and becomes organizational learning (Dechant, Marsick, & Kasl, 1993).

team learning – dynamic process of bringing individual knowledge to the group which results in shared learning (Dechant, Marsick, & Kasl, 1993).

team learning conditions - three conditions (appreciation of teamwork, individual expression, and operating principles) which precipitate team learning (Dechant, Marsick, & Kasl, 1993).

team learning outcomes – the indicators that reveal whether a team is learning as a group (Dechant, Marsick, & Kasl, 1993).

team learning processes - the learning that occurs in teams (Dechant, Marsick, & Kasl, 1993).

systems paradigm – the integration of several independent parts functioning as a whole (Wright, 1989).

## Chapter Two

### Literature Review

Relevant research and other academic literature are considered relative to three broad headings in providing the foundational support and conceptual framework for this study. The three headings are 1) organizational learning, 2) learning organization, and 3) team learning. Team learning originates from the fundamental concepts of organizational learning and the learning organization. Within this chapter, the concepts of team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions will be discussed (Dechant & Marsick, 1993). The concepts complement and build upon one another in a systems paradigm. Such a paradigm is essential in achieving organizational effectiveness and breakthrough innovation (Kasl, Marsick, & Dechant, 1997; Senge, 1990).

The concept of learning within organizations has garnered a significant target audience that is interested in discovering a cure-all approach to organizational effectiveness, competitiveness, and sustainable excellence (Schwandt & Marquardt, 2000). The “learning organization” is a basic theoretical paradigm although its function is tremendously intricate. Fundamentally, the premise of the learning organization rests firmly on two didactic paradigms regarding learning – 1) individual learning for self change (Rolls, 1995), and 2) learning for the organization to maximize effectiveness (Moingeon & Edmondson, 1996). Both perspectives are nurtured in a “systems” culture which highlights individual and team potential in pursuing the shared, common vision of the organization (Bennett & O’Brien, 1995; Nayak et al., 1995; Peters, 1997; Schein, 1986; Silverman & Casazza, 2000).

Although it received public notoriety after Senge’s 1990 publication of *The Fifth*

*Discipline*, the learning organization still seems to be a fledgling concept. Perhaps this may be attributed to the “confusing proliferation of definitions and conceptualizations that fail to converge into a coherent whole” (Popper & Lipshitz, 2000, p. 181) the essence of the learning organization. The literature suggests a distinction between organizational learning and the learning organization (Arygris & Schön, 1978; Easterby-Smith, Arajuo & Burgoyne, 1999; (Moingeon & Edmondson, 1996; Nayak et al., 1995; Schwandt & Marquardt, 2000; Yanow, 2001).

Yanow (2001) reports that organizational learning is represented by academic researchers who treat learning as “technical processing,” while learning organization proponents are represented by “social processing” consultants who rely on academicians for intervention purposes. Easterby-Smith, Arajuo and Burgoyne (1999) conclude that the “technical view assumes that organizational learning is about the effective processing, interpretation of, and response to, information both inside and outside the organization” (p. 3). Consequently, the social perspective of organizational learning “focuses on the way people make sense of their experiences at work” (p. 4).

Schwandt and Marquardt (2000) explain the difference between organizational learning and the learning organization as an argument of process versus product. The learning organization is a representation of a desired end, and organizational learning is a “representation of the dynamic human processes required to increase the cognitive capacity of the total organization” (Schwandt & Marquardt, 2000, p. 26). Interestingly, team learning incorporates both the technical and social processes of organizational learning and the learning organization. The technical aspect of team learning involves the cognitive processes which occur as a team member processes, interprets and learns as part of a team. The social

aspect of team learning focuses on how interpersonal relationships develop and promote learning during the cognitive processes. An analysis of the research regarding organizational learning and learning organizations follows and is succeeded by a synthesis of team learning within both paradigms.

### ***Organizational Learning***

Learning within companies is no longer the primary concern of only training specialists. It is more than the process that occurs inside the walls of educational institutions. In fact, literature suggests learning has progressed from preparing people for employment to sustaining employment (Boud & Garrick, 1999). The responsibility of workplace learning is being shared by all individuals within the organization for the purposes of individual, collective, and organizational productivity (Gilley & Maycunich, 2000a). Bould & Garrick (1999) explain learning at work as follows:

Workplace learning is concerned not only with immediate work competencies, but about future competencies. It is about investment in the general capabilities of employees as well as the specific and technical. And it is about the utilization of their knowledge and capabilities wherever they might be needed in place and time. (p. 5)

Moingeon and Edmondson (1996) indicate organizational learning is a source of competitive advantage for companies. Organizational learning occurs in the individual as well as the organization (Rolls, 1995) through team learning (Watkins & Marsick, 1993). Although organizational learning assumes focus on the organization, individuals comprise the organization (Argyris & Schön, 1978). Therefore, individual learning is a conduit for organizational learning. Inasmuch as individuals learn, adapt, and update their knowledge

and competencies, their learning is mutually beneficial to the organization (Nayak et al., 1995). “Just as individuals are the agents of organizational action, so they are the agents for organizational learning” (Argyris & Schön, 1978, p. 19).

Nayak et al. (1995) emphasize individual learning as a prerequisite for organizational learning. “Learning at the organizational level is constrained by the ability of individuals and teams to learn, so enhancing individual and team learning is a good starting point” (Nayak et al., 1995). Moingeon and Edmondson (1996) report organizations learn as social systems adapt, or change, or process incoming stimuli. The result is the merging of individuals’ cognitive functioning, aligned with the policies and structures of the organization. In essence, through team learning organizations marry individuals’ knowledge to the structure of the organization.

As cited in Moingeon and Edmondson (1996), Hedberg (1991) defines organizational learning “as the capability of an organization to adapt to its environment” (p.38). Shaw and Perkins (1991) note two themes of adaptation in the cultures of learning-efficient companies – the experimenting organization and the reflective organization. The experimenting organization is innovative and always seeking and trying new ventures. The reflective organization learns from both its successes and failures, and applies the learned knowledge to make decisions for its future.

Argyris and Schön (1978) differentiate between two types of learning – single-loop and double-loop. Single-loop learning occurs “when members of the organization respond to changes in the internal and external environments of the organization by detecting errors which they then correct so as to maintain the central features of organizational theory-in-use” (p. 18). Members function from operating within the rules and policies of an organization.

They progress from error detection to error correction (Argyris & Schön, 1978). Single-loop learning is most sufficient when errors are detected and changed within the framework of the organization's normative infrastructure. However, it is important to note that Argyris and Schön (1978) acknowledge that, on occasion, a change in the organizational norms may be necessary. Sometimes error correction means modifying the existing practices and policies.

Argyris (1991) describes double-loop learning as the ability to critically reflect upon personal behaviors, and acknowledge and identify ways those behaviors contribute to the organization's problems; then, modify the behaviors. Double loop learning is defined as "those sorts of organizational inquiry which resolve incompatible organizational norms by setting new priorities and weightings of norms, or by restructuring the norms themselves together with associated strategies and assumptions" (p. 24). Double-loop learning, through critical examination, connects the detection of error with the norms that define effective performance. It oftentimes redefines the norms that govern organizational behavior. In reference to learning and similar in scope to double-loop learning, Senge (1990) reports in order for organizations to survive, adaptive learning must be joined by generative learning, which he describes as learning that enhances the capacity to create (p. 14).

Harshman and Phillips (1994) report organizational learning involves an organization's capacity to modify the way it functions based on experience. The definition rests heavily on individuals' learning, and "trial and error" experiences to foster change in an organization. Therefore, the definition relies on an open organizational culture that embraces adaptability (Fulmer, 2000). Organizational culture has been widely recognized as having a powerful influence on organizational learning (Quinn, 1988). Schein (1986) reports an organization's culture is a result of shared learning. Accordingly, the culture shapes future learning.

Bennett and O'Brien (1995) suggest the culture should embody a climate of openness and trust, where ideas are invited and shared from supervisors and employees. Garvin (1994) cites definitions of organizational learning which also support the importance of culture (see Table 1).

Table 1  
Definitions of Organizational Learning

“Organizational learning means the process of improving actions through better knowledge and understanding.”

C. Marlene Fiol and Marjorie A. Lyles, “Organizational Learning,” *Academy of Management Review*, October 1985.

“An entity learns if, through its processing of information, the range of its potential behaviors is changed.”

George P. Huber, “Organizational Learning: The Contributing Processes and the Literatures,” *Organization Science*, February 1991.

“Organizations are seen as learning by encoding inferences from history into routines that guide behavior.”

Barbara Levitt and James G. March, “Organizational Learning,” *American Review of Sociology*, Vol. 14, 1988.

“Organizational learning is a process of detecting and correcting error.”

Chris Argyris, “Double Loop Learning in Organizations,” *Harvard Business Review*, September-October 1977.

“Organizational learning occurs through shared insights, knowledge, and mental models... (and) builds on past knowledge and experience – that is, on memory.”

Ray Stata, “Organizational Learning – The Key to Management Innovation,” *Sloan Management Review*, Spring 1989.

### ***Learning Organization***

Research reveals that the concepts learning organization and organizational learning are used interchangeably. However, when specifically referring to learning organizations, the literature describes a desired goal, the ideal (Easterby-Smith, Arajuo & Burgoyne, 1999; Garvin, 1994; King, 2001; Marquardt, 1996; Rolls, 1995). Senge (1990) describes the

learning organization as an organization that is continually expanding its capacity to create its future, while Rolls (1995) characterizes the learning organization as one which is continually adapting, learning, and responding to reinvent reality and a future to transform.

Both definitions are consistent with the phenomenon of team learning. As teams learn, they continuously improve and expand insight for themselves and the organization. Shaw (1991) describes organizational learning (in the context of a learning organization) as “the capacity of an organization to gain insight from its own experience, the experience of others, and to modify the way it functions according to such insight” (p. 1). Garvin (1994) reports the “learning organization is an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights” (p. 3.65). Bennett and O’Brien (1995) suggest a learning organization “has woven a continuous and enhanced capacity to learn, adapt, and change into its culture. Its values, policies, practices, systems and structures support and accelerate learning for all employees” (p. 3.79).

Nayak et al. (1995) advise that “learning organizations are those that are particularly adept at the processes that support continuous learning and productive change. This approach engages employees’ hearts and minds in continuous, harmonious, productive change designed to achieve results they genuinely care about and that the organization’s stakeholders want” (p. 15). Gephart, Marsick, Van Buren, and Spiro (1996) assert that the learning organization is

an organization that has an enhanced capacity to learn, adapt, and change. It’s an organization in which learning processes are analyzed, monitored, developed, managed, and aligned with improvement and innovation goals. Its vision, strategy, leaders, values, structures, systems, processes, and practices all work to

foster people's learning and development and to accelerate systems-level learning.  
(pp. 37-38)

According to Ellinger, Watkins, and Bostrom (1999), learning organizations are those that “continuously acquire, process, and disseminate knowledge about markets, products, technologies, and business processes” (p. 105). Harris and Gokcekus (2000) classify the learning organization as an organization in which “employees share knowledge, allowing deeper understanding and a more thorough approach to problem-solving. As a result, the organization is able to grow and change in keeping with its environment” (p. 145). Karash's (as cited in Sugarman, 1997) definition of a learning organization is “one in which people at all levels, individually and collectively, are continually increasing their capacity to produce results they really care about” (p. 1). King (2001) defines a learning organization as “one that creates, acquires, and communicates information and knowledge, behaves differently because of this, and produces improved organizational results from doing so” (p. 14).

### ***Synthesis: Organizational Learning and the Learning Organization***

According to the literature, numerous interdependent factors explain learning organizations. Shaw (1991) and Garvin (1994) emphasize learning, knowledge, and the transfer of knowledge. Shaw's (1991) definition awakens organizational consciousness wherein the organization affects continuous improvement as it learns the successes and failures of itself as well as its competitors, while operating from acquired insight. Argyris (1991) describes the process of double-loop learning as the ability to critically reflect upon personal behaviors, and acknowledge and identify ways those behaviors contribute to the organization's problems. Double-loop learning is especially compelling during team learning. Individual team members self-assess, identify, and modify behaviors to avoid

contributing to an organization's problems. Garvin's (1993) definition of a learning organization suggests the transferring of knowledge through a change in behaviors. The change in behaviors suggests more than simply complying; it resonates a theme of conformity (Johnson & Johnson, 2000). With respect to accomplishing a goal or working collaboratively, conformity becomes important for team learning. However, King (2001) asserts that Garvin's (1994) definition lacks organizational results.

Bennett and O'Brien (1995) append Garvin's (1994) assertion by adding the notion of adaptation in an organizational culture that embraces and accelerates learning. Other key aspects of the definition are the parallelism of individual and organizational learning, the alignment of learning with the mission, and the adaptability of the organization in inviting change. Fulmer (2000) points out that with the onset of societal and technological changes, organizations of the twenty-first century must prepare to adapt to an increasingly chaotic and uncertain future. Schwandt and Marquardt (2000) report that organizations are forced to continually adapt and change if they seek to survive in a changing environment. As teams learn, adapting and changing are achieved through the diversity of individuals (Gilley & Maycunich, 2000b; Johnson & Johnson, 2000).

According to Nayak et al. (1995), assessment of a learning organization depicts a systems-oriented functioning entity that concerns itself with the organization, its employees, and its stakeholders. Also within their definition is the conscious awareness of understanding the organization, its employees, stakeholders, achieved results, and the leadership needed to facilitate collaborative and constructive change. Gephart, Marsick, Van Buren, and Spiro's (1996) definition encompasses organizational learning – the process in lieu of the end product. It is apparent that organizational learning is an element of a learning organization.

Organizational learning depicts the skills and processes of building and utilizing knowledge (Marquardt, 1996). Moreover, within the definition resides what Argyris and Schön (as cited in Marquardt, 1996) describe as deuterio learning – learning which occurs when organization members gain knowledge for the organization by critically reflecting upon the organization’s taken-for-granted assumptions. Team learning assists the organization in such a critical reflection. The team is able to assess its successes and failures, and work to continuously improve organizational effectiveness.

Ellinger, Watkins, and Bostrom (1999) include continuous learning as a component within their understanding of a learning organization and, along with Harris and Gokcekus (2000), suggest growth of the organization. Harris and Gokcekus (2000) also propose knowledge sharing through teamwork, also known as team learning. Shelton (1999) believes “teams can become the vehicle that drives organizations toward truly becoming learning organizations” (p. 2). By imagining possibilities and breaking through traditional boundaries, team learning can lead to prosperous results for both teams and the organization for which they are a part (Senge, 1990).

Karash’s (as cited in Sugarman, 1997) definition implies the abandonment of the traditional leader-follower syndrome which presently exists in organizations. Kasl, Marsick, and Dechant (1997) support the abandonment of hierarchy, and like Karash (as cited in Sugarman, 1997), suggest a more flattened organization where the work and vision of employees are shared with that of the organization. King’s (2001) definition of a learning organization highlights communicating knowledge and information for the purpose of producing results. Communication, the key word with numerous connotations, is essential to unlocking the doors of true growth and future productivity, especially during team learning.

It is interesting to note differences and similarities within the definitions. The themes of the differences include organizational results, a focus on employees' individual development, cultural acceptance, continuous improvement, modification, deuterio learning, measurement, and implementing action. The common denominators are individual and collective sharing of knowledge; learning for self and the organization; adaptation to and flexibility for the mission, vision, goals, and strategic plan for the organization; development of a systems infrastructure which is embodied in the culture of the organization; free flowing of information in a creatively accepting, open, and caring environment; and, continuous learning and growth of the individual as well as the organization. Profound themes of systems thinking, knowledge sharing, and workplace future are present, and are identical to what is essential in team learning. All of the themes are included in how Senge (1990) officially characterizes the learning organization: "An organization where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together" (p. 3).

In conclusion, from examining the literature on organizational learning and learning organizations, a working definition of a learning organization for this study highlights collective action within organizations. A learning organization is an organization that achieves its mission by institutionalizing the acquisition of knowledge for individual, collective, and organizational growth, and shares the knowledge to modify its behavior for improved organizational results. From the synthesis of the literature, it is increasingly apparent that there exists a dynamic relationship between the learning organization and organizational learning. That relationship, when combined with team learning, creates a

phenomenon that organizations are seriously considering to strategically plan their futures. To further examine the intricacies of the future workplace, it is imperative to consider the research of Senge (1990) and to focus particular attention on his discipline of team learning.

### ***Learning Organization: The Influence of Senge***

How is the learning organization devised? The learning organization consists of numerous components that make it a coherent whole. Senge (1990) takes a collaborative approach to defining the learning organization by proposing five interrelated disciplines: 1) personal mastery, 2) sharing mental models, 3) shared vision, 4) team learning, and 5) systems thinking. Each discipline builds upon another and operates within a systems paradigm. Senge (1990) refers to personal mastery as “a special level of proficiency in every aspect of life – personal and professional” (p. 142). Here, Senge (1990) makes the point that personal and professional lives are compatible; each one enriches one another. Also, he makes apparent the fundamental principle of learning for the mutual benefit of the individual and the organization.

Pedler, Burgoyne, and Boydell (1997) indicate personal mastery involves self-development “of continually clarifying and deepening our personal vision, of focusing our energies, of developing patience and of seeing reality objectively” (p. 196). Rolls (1995) reports that “personal mastery is where the greatest self-evaluation and personal transformation is required” (p. 105). For employees of bureaucratic organizations, it means developing an increased and proficient level of personal mastery to deal with the rigidity of the organization (Kanter, 1995; Marquardt, 1996; Peters, 1997; Pinchot, 1993). Senge’s (1990) position is that people who have achieved personal mastery are comfortable with assuming risks and making mistakes – integral parts of learning organizations.

An established personal mastery is fundamental to the discipline of sharing mental models. Senge (1990) defines sharing mental models as “deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action” (p. 8). Mental models are derived from life experiences that define and shape a person’s beliefs and perspectives (Senge, 1990; Pedler, et al., 1997; Senge, Kleiner, Roberts, Ross, Roth, & Smith, 1999). A person’s mental model hosts his or her own preconceptions and assumptions (Pedler et al., 1997). Mental models are important to organizations because they highlight people’s differences which can create dissension in the workplace (Senge, 1990). However, the strength of mental models is their importance to workplace diversity (Gilly & Maycunich, 2000b). Such diversity presents opportunities to engage in thought-provoking and meaningful dialogue intended to improve organizational effectiveness. Gilly and Maycunich (2000a) state that organizational diversity should be celebrated because “individual differences lead to organizational initiatives that may bloom into new ideas, products, or efficiencies that capture the imagination (and potential customers)” (p. 44). It is also imperative to note Senge’s (1990) message of openness and sharing within the culture of the learning organization. By embracing this spirit one can confidently evaluate his own mental model and be open to changing it. Interesting to note is the merging of the mental model with personal mastery to create a shared vision, the third discipline of Senge’s learning organization.

Shared vision is a “vision that many people are committed to, because it reflects their own personal vision” (Senge, 1990, p. 206). A shared vision is “a shared picture of the future to foster genuine commitment and enrollment rather than compliance” (Pedler et al., 1997, p. 196.) Denton (1998) says a “shared vision is required to overcome the powerful forces

supporting the maintenance of the status quo” (p. 93). He further states that in order for successful learning to occur, it must be undertaken in pursuit of a specific goal. In essence, the goal provides the shared vision and is shared among all the employees and the stakeholders. It differentiates conformity from compliance (Johnson & Johnson, 2000). It is based on individual and collective participation and contributions, sharing, equality, respect, encouragement (Rolls, 1995), and the embracing of differences for the benefit of the organization (Gilly & Maycunich, 2000a). Thus, it is important for an individual to develop independent vision so that it can be shared with others. Nevertheless, individuals must be committed to detailing intellectual thought, time, and readiness into their personal visions prior to sharing them with others. Senge (1990) states that dynamics occur when individuals who possess a strong sense of personal direction collaborate to create a shared vision.

Team learning builds upon the discipline of shared vision. Team learning is the “process of aligning and developing the capacity of a team to create the results members truly desire” (Senge, 1990, p. 236). Collectively, team learning and shared vision work toward what members truly desire (Senge, 1990). He uses an analogy of professional musicians independently learning how to play musical instruments with extreme precision, but unless each person works well with the others, when coming together for a musical ensemble the musicians will not demonstrate a peak performance. The point he makes is that people must learn individually in order to work and learn together. Marquardt (1996) supports Senge’s belief and adds that self-directed learning and an unrestricted flow of ideas and creativity are necessary for team learning to survive in learning organizations. Senge (1990) specifies that dialogue and open communication are essential to effective team learning.

Team learning is an important component of systems thinking. Systems thinking, the

fifth discipline, is a fusing of the first four disciplines. Senge (1990) reports that systems thinking “integrates the disciplines, fusing them into a coherent body of theory and practice” (p.12). He capitalizes on the concept of wholeness, pointing out that independent parts become dependent upon one another, and interrelationships exist among the independent parts (each discipline). “Systems thinking is a methodology for seeing in wholes and for recognizing the patterns and the interrelatedness of parts in wholes” (Pedler et al., 1997, p. 196-197.) Senge (1990) suggests underlying structures must be examined in organizations to determine what causes patterns of behavior to exist. Rolls (1995) supports such an assertion and adds the concept that the organization’s infrastructure must welcome and adapt to change.

Literature states the five disciplines presented by Senge are intricately connected in describing the learning organization. Although the systems paradigm is heavily relied upon, a core component of the learning organization is team learning (Kim, 1993). Like Senge (1990), Kim believes the transition from individual learning to team learning is crucial to organizational learning, and the team’s learning is dependent upon how individuals act and perceive within their mental models. Senge, Kleiner, Roberts, Ross, and Smith (1994), in *The Fifth Discipline Fieldbook*, indicate people are more intelligent together than they are individually. They posit that “if you want something really creative done, ask a team to do it – instead of sending one person off to do it on his or her own” (p.51).

Other research contributes to the learning organization paradigm, especially with regard to team learning. Garvin (1994) identifies five main activities for learning organizations which are particularly poignant when considering team learning: systematic problem solving, experimentation with new approaches, learning from their own experience and past history,

learning from the experiences and best practices of others, and transferring knowledge quickly and efficiently throughout the organization. Bennett and O'Brien (1995) report that organizations prosper when individuals and teams share their learning, when they consider mistakes as learning opportunities, when they assume responsibility for their own learning, and when they honestly discuss problems and work toward solutions. Kline and Saunders (1993) report that within team learning "synergistic sharing promotes complex patterns of interaction that strengthen the enterprise" (p. 108), and puts learning power to work by allowing "everyone of/within the organization to actually or potentially learn for the improvement of the organization" (p. 130). Additionally, the above components emphasize collaborative efforts, systems paradigms, open communication, shared responsibility, employee empowerment, and the mutual learning of the organization and the individual. Nevertheless, there exists one resounding theme which appears to have a significant and repetitive role in the learning organization – team learning.

### ***Team Learning***

Learning through cooperation and consensus is an interesting phenomenon that deals with balancing individual and shared learning. The balancing requires persuasion, negotiation, leadership abilities, a willingness to be lead, and a motivation to learn. The relationship between these factors and organizational learning forms a dynamic interchange. The relationship is of interest because "agreements that yield higher joint benefit are more likely to persist and to contribute to the relationship between the parties and the welfare of the larger collectives of which they are parts" (Ben-Yoav, 1983, p. 323). Senge's (1990) *The Fifth Discipline* has summoned attention to the importance of team learning, but limited empirical research has been conducted. Senge (1990) is quite adamant about the significance

of team learning:

Team learning is vital because teams, not individuals, are the fundamental learning unit in modern organizations. This is where ‘the rubber meets the road’; unless teams can learn, the organization cannot learn. (p.10)

Yukl (1998) describes teams as “small task groups in which members have a common purpose, interdependent roles, complementary skills, and considerable discretion about how to do their work” (p. 351). Garvin (2000) reports teams provide opportunities to pool complementary skills, explore innovative frameworks, and share knowledge. Sharing knowledge is not a simple process. Johnson and Johnson (2000) indicate learning occurs in teams when members work together to maximize individual and collective knowledge. Senge (1999) suggests that learning how to think together involves high level skills. In fact, Senge (1999) differentiates sharing information from sharing knowledge. He concludes that sharing information is the process of passing something from one place to another. Yet, knowledge is the capacity for action. “Sharing knowledge occurs when people are genuinely interested in helping one another develop new capacities for action; it is about creating learning processes” (p. 7). Matthews and Candy (1999) support Senge’s notion and add the following:

It has been customary to think about knowledge essentially in the context of the individual knower, and, as Spender (1994) points out, a useful distinction can be made between individual knowledge which is consciously held, and that which is tacit or implicit. However, of particular relevance to the study of organisations is the fact that there is also social knowledge, which likewise might be either explicit or tacit. (p. 54)

Matthews and Candy (1999) further indicate there are facets of knowledge, differentiating between declarative (knowing what) and procedural (knowing how) knowledge. Thus, Matthews and Candy (1999) confirm that “some knowledge is explicit and publicly shared whereas [other knowledge] is tacit or implicit” (p. 52). Such knowledge plays a pivotal role for team learning in hierarchical structures. Sternberg (1994) says knowledge is how a person sees and interprets the world. It is here that the importance of team learning is concretely recognized. In workplace environments, a significant amount of acquiring, delegating, and applying knowledge actually occurs in team settings.

Draaisma (2001) proposes team learning occurs when employees assemble in a group at a work site on a periodic basis to work through problems, generate new ideas and learn from one another. Yukl (1998) concludes team learning occurs as a result of conducting systematic analyses after completion of an activity to unveil the successes and failures. Senge (1990) defines “team” as a “group of people who function together in an extraordinary way – who trusted one another, who complemented each others’ strengths and compensated for each others’ limitations, who had common goals that were larger than individual goals, and who produced extraordinary results” (p.4). Further, Senge (1990) defines team learning as “the process of aligning and developing the capacity of a team to create the results its members truly desire” (p. 236). Matthews and Candy (1999) define team learning as a “group [that] creates knowledge for its members, for itself as a system, and for others, using processes of framing, reframing, experimenting, crossing boundaries and integrating perspectives” (p. 54). Their definition originates from the research of Marsick, Dechant, and Kasl (1991), Kasl, Marsick, and Dechant (1992; 1997), and Dechant and Marsick (1993) who define team learning “as a process through which a group creates knowledge for its members, for itself as a system, and for others” (p. 227).

Through initial case study research at two companies, bearing the pseudonyms Petrochemical Company and Brewster Company, Watkins and Marsick (1993) asserted that learning differs in four unique team learning stages. Since the word stage implied a one-way, sequential progression that failed to capture the complex nature of a team's development as a learning system, they later changed "stage" to "mode." Mode, instead, characterizes the nonlinear change that typifies a team's operation as a learning system. The nonlinear change occurs back and forth through four modes – fragmented, pooled, synergistic, and continuous (Kasl, Marsick, & Dechant, 1997). In the fragmented mode, individual team members may learn but do not necessarily share or exchange their insights. Since they fail to share, they could be relying on misguided or incorrect knowledge. In the pooled mode, individuals share personal perspectives with others. However, there is no sharing of information with all team members which creates a possible void of reconciling opposite viewpoints to forge a unified perspective. At the synergistic mode, the team jointly constructs shared meanings, assumptions, and language which lead to consensually developed solutions, positions, and recommendations. In the continuous mode, individuals master the team learning processes, and use them subconsciously. It is important to note that teams move in and out of the modes as circumstances change surrounding membership, new challenges, and refined learning.

In their research, Kasl, Marsick and Dechant (1993) relied upon the literature on team learning and group dynamics to provide insight into how teams manage tasks and interpersonal relationships. They summarized the research into three team learning conditions: 1) appreciation of teamwork, 2) individual expression, and 3) operating principles. The capacity for task management is fundamental to the learning conditions they refer to as operating principles, and interpersonal relationships to the conditions they call

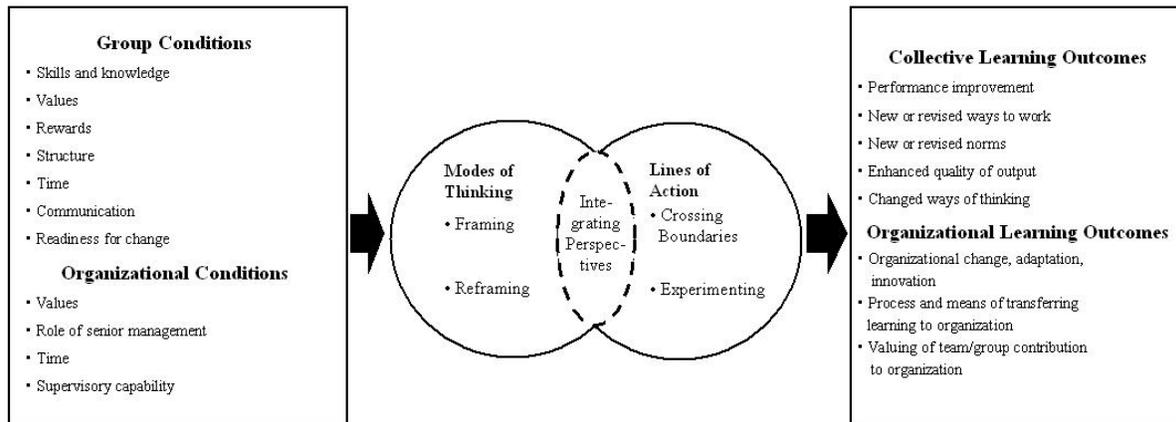
appreciation of teamwork and individual expression. From group dynamics literature, they use operating principles to reflect how well a team collectively established commonly held beliefs, values, purpose, and structure. The term appreciation of teamwork represents the need to be open to hearing and considering each other's ideas, and individual expression represents the ability of everyone to offer input within the team and organization. In addition to healthy group dynamics, the authors addressed cognitive processes (framing, reframing, integrating perspectives) and two specific, linked behaviors (crossing boundaries, experimenting) that they report were absent from the organizational literature (Kasl, Marsick, & Dechant, 1997).

Watkins and Marsick (1993) describe five processes of team learning which call for integrated thinking and action; framing, reframing, experimenting, crossing boundaries, and integrating perspectives. Watkins and Marsick (1993) define the five processes as follows (pp. 99-102):

Table 2  
Five Processes of Team Learning

Framing	Framing is an initial perception of an issue, situation, person or object based on past understanding and present input.
Reframing	Reframing is a process of transforming that perception into new understanding or frame
Experimenting	Experimenting is action undertaken to test a hypothesis or a move or to discover something new
Crossing Boundaries	When two or more individuals and/or teams communicate, they cross boundaries
Integrating Perspectives	Group members synthesize their divergent views such that apparent conflicts are resolved through dialectical thinking, not compromise or majority rule

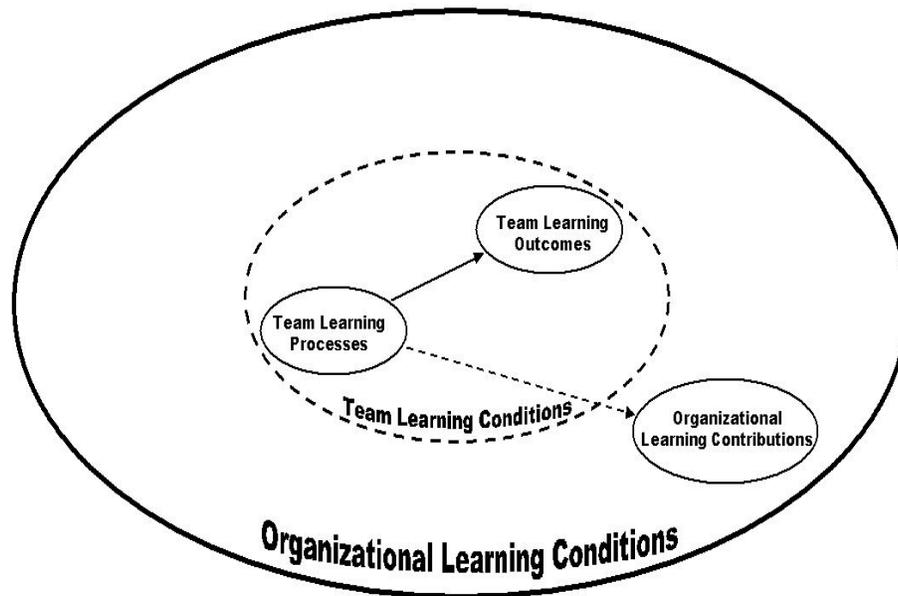
These processes are included in an empirical model of group learning (see Figure 1).



Dechant, K., & Marsick, V. (1993). *Team learning survey: Facilitator guide*. King of Prussia, PA: Organization Design and Development.

Figure 1. Empirical Model of Group Learning.

The model depicts the group and organizational conditions that merge with the five aforementioned processes of team learning. The model further illustrates how team learning becomes organizational in nature (Kasl, Marsick, & Dechant, 1993). It indicates the framing and reframing processes are cognitive and the experimenting and crossing boundaries processes are action oriented. The cognitive and action processes are interactive and lead to collective learning outcomes for the team and the organization. From the empirical model, Kasl, Marsick, and Dechant (1993) adopted a conceptual framework of team learning from which a model for team learning emerged (see Figure 2).



Dechant, K., & Marsick, V. (1993). Team learning survey: Facilitator guide. King of Prussia, PA: Organization Design and Development.

*Figure 2.* Team Learning Model.

The model consists of an analysis of a team’s learning by considering team learning outcomes and organizational learning contributions. The outcomes and contributions advise a group of how well learning is occurring and how learning is transferred to the organization. The model also entails team learning processes which provide insight into the behaviors people exhibit while learning in groups. Within the model, team and organizational learning conditions establish what must exist for a team’s learning to transfer to organizational learning. Moreover, those same conditions determine the learning processes that promote and inhibit team learning.

Team learning outcomes measure the team members’ collective assessment of how well the group is functioning as a whole. Organizational learning contributions measure the extent to which the outcome of a team’s work is shared inside and outside the team, and transfers to organizational learning. Team learning processes measure the extent to which

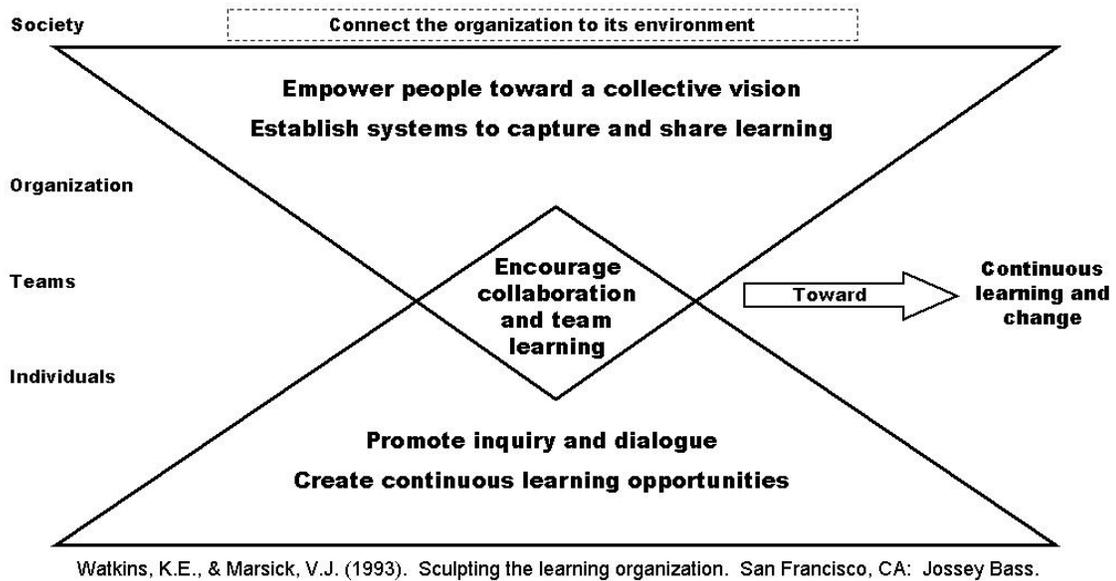
team learning processes occur as a result of team members modifying their thoughts and behaviors based on information learned from other team members. Team learning conditions measure a team's ability to learn and to generate learning outcomes, while organizational learning conditions measure the extent to which the outcome of a team's work is accepted by the organization. Dechant and Marsick (1993) subcategorize two sets of organizational learning conditions - support for the operation of teams and support for collaboration within the organization - that influence the operation of teams and determine the extent to which the team's work is accepted and embedded within the organization.

Dechant and Marsick (1993) developed the Team Learning Survey based upon their theoretical construct of team learning derived from the 1991 research of Marsick, Dechant, and Kasl. Their research focused on how people learn in teams and how their learning is incorporated throughout the organization. Specifically, the researchers conducted more than 60 interviews at two Fortune 100 companies. Their findings resulted in the aforementioned model of team learning which led to the Team Learning Survey. The present study uses the survey to examine the team learning processes, conditions, contributions, and outcomes of nurses at ABC Hospital.

Gilley and Maycunich (2000a) advise that learning is fostered or hindered based on the ways teams interact. Senge (1990) stresses that the discipline of team learning is founded upon effective dialogue and discussion. By dialogue, he means "the free and creative exploration of complex and subtle issues, a deep 'listening' to one another and suspending of one's own views" (p. 237). By discussion, Senge (1990) refers to expressing different views which are presented, defended, and evaluated to make the best decisions for the organization.

Watkins and Marsick (1993) conclude that team learning involves integrating diverse perspectives into a contingent whole. Senge (1990) calls this generative learning, indicating

a type of learning which requires reflection and inquiry skills. Watkins and Marsick (1993) developed a model which depicts the relationship of learning among individuals, teams, and the organization through the use of two triangles (see Figure 3).



*Figure 3.* Learning among individuals, teams and the organization where the encouragement of collaboration and team learning facilitate continuous learning and change.

The upper triangle represents the organization’s empowering of people and establishing systems to facilitate learning, while the lower triangle represents the individual’s promoting inquiry and dialogue, and creating continuous learning opportunities. Where the two triangles merge is the union of encouraging collaboration and team learning. The merging is the knowledge that has been acquired through collaboration and sharing. This leads to continuous learning and change.

Watkins and Marsick (1993) identify six action imperatives in determining team learning with learning organizations:

1. Create continuous learning opportunities

2. Promote inquiry and dialogue
3. Encourage collaboration and team learning
4. Establish systems to capture and share learning
5. Empower people toward a collective vision
6. Connect the organization to its environment (p. 11)

The researchers assert that the six imperatives complement one another, consistent with Senge's (1990) five disciplines working in a systems paradigm. The team learning action imperatives are consistent with adult learning theory and emphasize the sharing of knowledge. Liebowitz (2000) notes knowledge is the most critical asset of today's organization, and replaces the old adage that "knowledge is power" with "sharing knowledge is power" (p. 1). The sharing of knowledge is conducted through teams who have a critical role in the learning process.

Gilly and Maycunich (2000a) indicate team learning is critical to the framework of a learning organization because it allows "people to experience things from a myriad of vantage points, enabling them to expand their horizons, deepen their understandings, amplify their perspectives, and develop a better sense of self" (p. 18). Marquardt (1996) believes team learning is crucial to the learning organization format because learning organizations teach and equip team members with the knowledge, skills, and processes to problem solve. In order to teach and equip these members, organizations must abandon the traditional concept of hierarchy (Bennett & O'Brien, 1995; Kreutzer, 1995; Osborne & Plastrik, 2000; Peters, 1997; Pinchot, 1993; Senge, 1990). A systems paradigm offers the remedy for organizations to create a culture that embraces the learning conditions (appreciation of team work, individual expression, and operating principles) and learning processes (fragmented, pooled, synergistic, and continuous) researched by Watkins, Marsick, and Dechant (1993).

In such a culture, according to Kline and Saunders (1993), the workplace becomes safe for honest improvements. Improvements are manifested in numerous types of teams. Yukl (1998) identifies and characterizes different types of teams – work teams, project teams, cross-functional teams, self-managed teams, quality circles, committees, task forces, and executive teams. Teams acquire and generate knowledge through collective analysis of complex issues, innovative action, and problem solving (Marquardt, 1996; Pfeffer and Sutton, 2000). Further, the insight learned from teams can be shared throughout the organization which could be particularly useful for other teams as well as for organizational growth.

The implementation of team learning in organizations highlights the prospect of learning in organizations. Vogt (1995) says that “corporations must emphasize enhanced learning processes and skills of learning rather than focus solely upon traditional courses and knowledge transfer” (p. 295). Vogt’s concerns are consistent with Garger (1999) in that Vogt ascribes to the theory that organizations need to focus on the conversion of the training event to a learning process. Vogt (1995) subscribes to a learning process wherein the focus is preparing to solve complex problems as opposed to acquiring a set of certain skills. Vogt also characterizes team learning as a necessary requisite for organizational learning. In fact, he surmises that team learning is the DNA of business learning: “Team learning is the art of establishing trust, framing motivating questions, and engaging in the generation of new perspectives through the art of dialogue” (p. 296).

Vogt (1995), Senge (1990), and Watkins and Marsick (1993) highlight the significance of collaborative work efforts in team learning. Learning is aligned with generating new ideas, creating new perspectives, and then socially constructing new perspectives to ensure they become codified and shared by other team members (Vogt, 1995). Additionally, learning

must focus on the learners' experiences, styles, diverse backgrounds, and motivations, as well as other essential components of designing the acquisition of knowledge. Masten (1995) states that learning begins with the individual and multiplies with the team. "As individual team members learn to develop vision, values, and mental models which they share in common, they become better able to harness their collective wisdom. As members bring expanded understanding of themselves and the team to the organization, they become better able to actualize the organization's future" (p. 441). Marquardt (1996) adds that the mental model and image for learning must be met with excitement, enthusiasm, fun, personal responsibility, sharing, and personal and organizational growth.

Kim (1993), reflecting upon Senge's (1990) mental models, insists that the nucleus of understanding organizational learning relies upon individual learning. Making mental models explicit promotes the development of new mental models and makes learning independent of any individual. Kim (1993) claims that organizations can learn independent of any specific individual but not independent of all individuals. Moreover, the transition from individual learning to team learning is crucial to organizational learning, and the team's learning is incumbent upon how individuals act and perceive within their mental models. The transition involves the process of institutionalizing individual learning in the organization's culture (Kim, 1993; Schwardt & Marquardt, 2000; Vogt, 1995).

### ***Summary and Conceptual Framework***

The literature review provides insight into learning from the perspectives of the individual, the team and the organization. Using teams as learning bodies, the foundation of this study is grounded in the theories of the learning organization and organizational learning. Organizational learning focuses on maximizing the learning potential for the individual as well as the organization. The learning organization focuses on a systems approach of

fostering intellectual capital for the individual and the organization. Team learning is the vehicle that drives the systems approach.

Team learning highlights the collaboration involved in improving organizational effectiveness. It is through the team that organizations sense change. As individuals on a team modify their personal beliefs based on information learned from others, the benefit of the individual, the team, and the organization is realized. Thus, the learning organization, organizational learning, and team learning are intricately related.

The research of Marsick and Dechant (1993) expounds upon the dynamic relationship of organizational learning, the learning organization, and team learning. Their Team Learning Model links the learning that occurs in teams to the organization for which the team is a part. The relationship of team learning processes, conditions and outcomes is consistent with the learning organization theory and the team learning model.

Team learning processes determine the extent to which team members modify their thoughts and behaviors based on information they learn from others. Team learning conditions measure a team's ability to learn and generate learning. Team learning outcomes provide insight into team members' collective assessment of how well the group is learning and functioning as a whole. Individually or in combination, these team learning variables specifically correspond with the learning of the individual and the team. The variables also provide an indication of how individual and team learning promotes organizational learning.

The organizational learning theory is united with the organizational learning conditions and contributions. The organizational learning contributions indicate whether the learning in teams is accepted by the organization. Organizational learning conditions measure whether the outputs of the team's work are perceived to be accepted by and promoted within the organization. It is here where team learning outcomes are perceived as the end results of

how well the team learns; and, the organizational learning contributions and conditions suggest whether the learning in teams is transferred to the organization.

The learning organization, team learning, and organizational learning theories are interdependent upon one another. Likewise, the team learning variables also function from a systems paradigm. Within the paradigm learning becomes a partnership for individual, team, and organizational growth. Accordingly, the research of Dechant and Marsick (1993) is applicable to the partnership as measured by their instrument, The Team Learning Survey. The Team Learning Survey examines team learning variables from a collaborative perspective. The collaboration identifies each of the five team learning variables but fails to provide insight into the interaction of the variables. This study explores the interaction of the variables from a systems approach. The interaction of the variables may contribute to understanding team learning.

The literature points out the value in studying team learning. Since today's organizations are operating within an information age environment, organizations are in a constant state of flux (Brown, 2000; O'Driscoll, 1999; Senge, 1999). They are continuously trying to develop or maintain a competitive strategic advantage (Rolls, 1995). Thus, with the persistent information and technological advancements within today's society, it is necessary for organizations to develop a capability to adapt to change (Mariotti, 1999; O'Brien and Buono, 1999; Senge, 1999). Moreover, the literature suggests that in order for organizations to compete in a global market, they must learn faster than their competitors. And, collective knowledge is far more advantageous than individual knowledge. Thus, team learning provides the capability to adapt to change as change is critical to strategic competition.

Organizational learning is a core requirement for sensing change and learning how to adapt in response to change. Learning is emphasized for the mutual benefit of the individual

and the organization. Team learning is the nucleus of organizational learning and the learning organization. Thus, there is a critical need for organizations to understand how team learning is a viable source of strategic advantage.

This study uses the Team Learning Survey to examine the extent to which learning occurs in a team. In employing the survey, this study assumes a dual purpose. The dual purpose is depicted in a conceptual framework (see Figure 4).

First, this study examines the interaction of the team learning variables to gain insight into whether the variables individually or in combination contribute to understanding team learning. The figure also illustrates the interrelatedness of team learning, organizational learning, and the learning organization. Secondly, the conceptual framework for this study takes an already established team to determine whether team learning is relevant to particular work and demographic variables (ethnicity, gender, salary, age, professional degree, work status, and nursing longevity). The team learning constructs of team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions assist in determining the extent to which a team is engaged in team learning, and whether the learning from the team is facilitated throughout the organization (Dechant and Marsick, 1993).

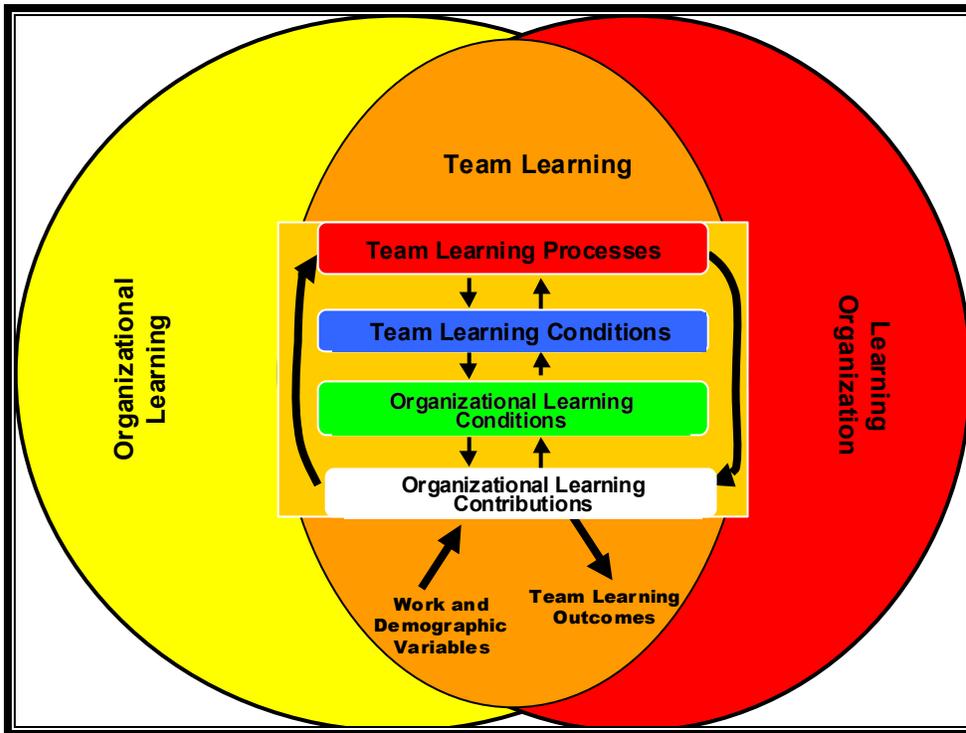


Figure 4. Conceptual framework for dissertation study with respect to organizational learning, the learning organization, and team learning.

## **Chapter Three**

### **Methodology**

The purpose of this study is twofold. First, it explores the interaction of the team learning variables as developed by Dechant and Marsick (1993). The team learning variables are team learning processes, team learning conditions, team learning outcomes, organizational learning conditions and organizational learning contributions. The interaction of the variables is being studied to provide deeper insight into whether the variables individually, or in combination, add understanding to team learning theory.

Secondly, this study uses an already established work team and analyzes whether team learning theory is related to specific work and demographic variables. The central focus of this study is the exploration of the interaction of team learning variables. This study furthers inquiry into the interaction of the variables by examining the interactions in relation to particular work and demographic variables. The work and demographic variables are age, gender, ethnicity, employment status (full or part-time), years of work, professional degree and salary. These work and demographic variables were chosen because they are supported theoretically by adult education literature.

Varied ages reflect differences in accumulated life and work experiences, and indicate possible value for relationships such as teams (Merriam & Caffarella, 1999). Likewise, value has been associated with life and work experiences with respect to gender roles and some cultural backgrounds (Merriam & Caffarella, 1999). Years of work can be considered a measure of accumulated experiences specific to a profession or an organization. Prior education, measured here by professional degree, has been suggested to be associated with an affinity for participation in further learning (Merriam & Cafferella, 1999). Employment status (full or part-time) and salary levels may suggest possible differences in degree of

commitment to work related tasks (Smolak, 1993). Studying the effects of these demographics will enhance the understanding of how team learning is applied in real world work environments.

The team selected for analysis is nurses at ABC Hospital. The nursing team at ABC Hospital was chosen because teamwork is fundamental to their work product. Also, they rely upon the knowledge of one another to provide care for patients.

### ***Overview of Research Methodology***

The research methodology for this study is described in the following six sections: 1) research design, 2) population and sample, 3) selection of study site 4) instrumentation, 5) data collection, and 6) data analysis. This study answers the following research questions:

Research Question 1) What are the gender, ethnic, professional degree, nursing longevity, salary, and age characteristics of nurses at ABC Hospital?

Research Question 2) Do team learning processes, team learning conditions, organizational learning contributions and organizational learning conditions have an impact on team learning outcomes among nurses at ABC Hospital?

Research Question 3) Do team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions differ by ethnicity, gender, degree, full- vs. part-time work status, age, and salary?

Research Question 4) Is there a relationship among team learning processes, team learning conditions, organizational learning contributions, and nursing longevity, salary and age?

Research Question 5) Is there a relationship among organizational learning conditions, team learning outcomes, and nursing longevity, salary and age?

### ***Research Design***

A cross-sectional, one-group design was used in this study. This study employs quantitative descriptive research. Quantitative descriptive research involves making careful descriptions about a population or phenomenon (Borg & Gall, 1996). In this study, subjects were surveyed at one data collection point with two reminders to return surveys.

### ***Population and Sample***

The target population for this study consisted of nurses who work in teams at ABC Hospital. The Director of Nursing's Administrative Assistant provided a list of nurses who work in teams. A simple random sampling procedure was run in SAS Institute version 8.2 to select a sample of 500 nurses from a population of 1,090 nurses who work in teams. Simple random sampling was used for several reasons. First, it is a "process of selecting from a population that provides every sample of a given size an equal probability of being selected" (Borg & Gall, 1996, p. 220). Secondly, the procedure was used to determine which nurses would receive the survey. Thirdly, it was used because it yields research data that can be generalized to a larger population within margins of error that can be determined statistically (Borg & Gall, 1996).

Survey questionnaires were distributed to the randomly selected nurses. After distribution of the surveys, the researcher became aware that six employees were either no longer employed by the hospital, or were on sick leave. Thus, the sample was reduced from 500 to 494. Of the 494 possible respondents, 179 nurses completed and returned surveys. Therefore, a response rate of 36.2 percent was achieved. Gall, Borg and Gall (1996) suggest a minimum sample size of 100 subjects in each major subgroup. Thus, the sample size for the present study is considered more than adequate (Gall, Borg & Gall, 1996, p. 229).

### ***Selection of Study Site***

The focus of this study involves learning that occurs in teams. The learning is assumed to transcend from the individual, through the group, and ultimately to the organization. To analyze team learning, nurses at ABC Hospital were selected.

Teamwork is a core requirement for nurses at ABC Hospital. The hospital has nursing teams who care for patients within a specific area, whether on a floor or in a particular unit. As such, there is a critical need for nurses to rely upon one another, and to share learned information. The need to learn collaboratively is necessitated by the consistent change and advancements in technology and improved medical practices. This study examines whether the learning that occurs in teams is perceived to be accepted by the organization.

ABC Hospital has a tradition of providing exceptional medical services. Nurses assist in the delivery of healthcare services. Since ABC Hospital is a teaching hospital and nurses there work in teams, it seemed an appropriate venue to study team learning.

### ***Instrumentation***

This study uses the Team Learning Survey developed by Dechant and Marsick (1993) which was based on the research conducted by Dechant, Marsick, and Kasl (1993). Data was collected via distribution of the Team Learning Survey (see Appendix A). The survey instrument consists of 5 categories (team learning outcomes, organizational learning contributions, team learning processes, team learning conditions, and organizational learning conditions, as defined in the selection below) totaling 60 questions. To the researcher there is reason to ask whether work and demographic characteristics impact the team learning variables. Accordingly, the researcher included eight additional questions to collect demographic information regarding age, ethnicity, gender, educational level, nursing longevity, nursing employment at ABC Hospital, salary, and employment status (full-time or

part-time). Of the 60 questions on the team learning survey, 7 reference team learning outcomes, 8 reference organizational learning contributions, and 16 reference team learning processes. There are a total of 16 items (3 subscale categories) regarding team learning conditions, 8 of which reference appreciation of teamwork, 3 reference individual expression, and 5 reference operating principles. Thirteen items address organizational learning conditions (2 subscale categories), 7 of which relate to the support for the operation of teams while 6 items reference support for collaboration within the organization.

Cronbach's Alpha validates the reliability of the Team Learning Survey. "Cronbach's Alpha is a measure of the reliability of an instrument or the extent to which an instrument produces consistent results"(Dechant & Marsick, 1993, p. 21). The measure ranges from zero (extremely poor reliability) to one (perfect reliability). Each category of the Team Learning Survey (team learning outcomes, organizational learning conditions, team learning processes, team learning conditions, and organizational learning conditions) was tested for internal consistency and yielded either high or acceptable scores. The internal consistency for each team learning variable is as follows: team learning outcomes (Alpha = .82); organizational learning contributions (Alpha = .77); team learning processes (Alpha = .89); team learning conditions (appreciation of teamwork, Alpha = .88; individual expression, Alpha = .68; operating principles, Alpha = .71); and, organizational learning conditions (support for the operation of teams, Alpha = .82; support for collaboration of teams, Alpha = .77) (Dechant & Marsick, 1993). "The internal consistency of the entire survey was very high (Alpha = .94). This reflects the strong relationship among the five components of the instrument based on the Team Learning Model. A test-retest reliability analysis was conducted using 88 part-time MBA students who were professional managers and technicians. The 60-item version of the survey was administered twice to the same sample,

two weeks apart. The test-retest reliability was high (.89).” (Dechant & Marsick, 1993, p. 25).

Each of the items on each of the scales and subscales of the Team Learning Survey uses a Likert scale with a range of scores from one to seven with the following equivalences:

1 = Firmly Disagree (FD)

2 = Moderately Disagree (MD)

3 = Slightly Disagree (SD)

4 = Neither Agree nor Disagree (N)

5 = Slightly Agree (SA)

6 = Moderately Agree (MA)

7 = Firmly Agree (FA)

Two subscale categories were negatively stated (individual expression and support for collaboration within the organization) so the positive responses were designed to reflect higher scores. Each of the five categories of the Team Learning Survey focus on a specific aspect of team learning as related in the Team Learning Model:

1) Team Learning Outcomes is a measure of the team members’ collective assessment of how well the group is functioning as a whole. The range of possible scores is from 7 to 49. Dechant and Marsick (1993) categorize scores for team learning outcomes as follows: unfavorable scores (ranging between 7 and 23), neutral scores (ranging from 24 to 31), and favorable scores (ranging from 32 to 49). Scores below 7 indicate no team learning outcomes (see Table 3).

Table 3  
Range of Scores for Team Learning Outcomes

Variable	Possible Scores	Unfavorable	Neutral	Favorable
Team Learning Outcomes	7 - 49	7 - 23	24-31	32-49

2) Organizational Learning Contributions is a measure of the extent to which the outcome of a team’s work is shared inside and outside the team, and transfers to organizational learning. The possible scores range from 8 to 56. The scores for organizational learning contributions are divided into three categories: unfavorable (scores ranging from 8 to 31), neutral (scores between 32 and 39), and favorable (scores between 40 and 56) (see Table 4).

Table 4  
Range of Scores for Organizational Learning Contributions

Variable	Possible Scores	Unfavorable	Neutral	Favorable
Organizational Learning Contributions	8-56	8-31	32-39	40-56

3) Team Learning Processes is a measure of the extent to which team learning processes are perceived to occur as a result of team members modifying their thoughts and behaviors based on information learned from other team members. Possible scores range from 16 to 112. Scores are divided into three categories: fragmented (scores ranging from 16 to 68), pooled (scores ranging from 69 to 80), and synergistic (scores ranging from 81 to 112). The three categories are synonymous with unfavorable, neutral, and favorable, respectively (see Table 5).

Table 5  
Range of Scores for Team Learning Processes

Variable	Possible Scores	Unfavorable	Neutral	Favorable
Team Learning Processes	16-112	16-68 (fragmented)	69-80 (pooled)	81-112 (synergistic)

4) Team Learning Conditions is a measure of a team’s perceived ability to learn and to generate learning outcomes. Possible scores for the team learning conditions category range from 16 to 112. However, the category consists of three subscales (appreciation of teamwork, individual expression, and operating principles) that have a separate range of scores. Possible scores for appreciation of teamwork (hearing and considering others’ ideas and viewpoints) range from 8 to 56. Unfavorable scores range from 8 to 33; neutral scores range from 34 to 39; and favorable scores range from 40 to 56. Possible scores for individual expression (extent to which team members contribute to the team’s mission and influence the team’s progression) range from 3 to 21. Unfavorable scores range from 3 to 10; neutral scores range from 11 to 14; and favorable scores range from 15 to 21. Possible scores for operating principles (extent to which the team effectively and efficiently operates) range from 5 to 35. Unfavorable scores range from 5 to 13; neutral scores range from 14 to 19; and favorable scores range from 20 to 35 (see Table 6).

Table 6  
Range of Scores for Team Learning Conditions

Variable	Possible Scores	Unfavorable	Neutral	Favorable
Team Learning Conditions:				
Appreciation of Teamwork	8-56	8-33	34-39	40-56
Individual Expression	3-21	3-10	11-14	15-21
Operating Principles	5-35	5-13	14-19	20-35

5) Organizational Learning Conditions is a measure of the extent to which the outcome of a team's work is perceived to be accepted by the organization. Possible scores in this category range from 13 to 91, but two subscales (support for operation and support for collaboration) have different ranges. Support for operation (support and tolerance of managers) scores range from 7 to 49. Unfavorable scores range from 7 to 26; neutral scores range from 27 to 34; and favorable scores range from 35 to 49. Support for collaboration (the extent to which the organization values and rewards sharing throughout the entire organization) scores range from 6 to 42. Unfavorable scores range from 6 to 17; neutral scores range from 18 to 25; and favorable scores range from 26 to 42 (see Table 7).

Table 7  
Range of Scores for Organizational Learning Conditions

Variable	Possible Scores	Unfavorable	Neutral	Favorable
Organizational Learning Conditions: Support for Operation	7-49	7-26	27-34	35-49
Support for Collaboration	6-42	6-17	18-25	26-42

***Data Collection***

To conduct this study, permission was sought from the Director of Nursing. She scheduled a meeting with the researcher and her management staff to explain and seek their consent in participating in the study. A copy of the researcher’s study proposal, plans, and a projected time frame for participation were provided by the researcher. Once permission was granted, information about the study and all subsequent correspondence packages were placed in nurses’ individual employee mailboxes.

Correspondence packages included information regarding the purpose of the study; directions for completing a survey questionnaire; a survey questionnaire; self-addressed, stamped envelope; and, a response form to indicate answers. The Team Learning Survey was placed in nurses’ mailboxes along with a letter explaining the study. Participation was voluntary. Nurses were advised that all responses would be held in strict confidence and only aggregate, not individual findings would be reported. Those who did not respond to the survey after follow up reminders were considered non-responders. The nursing administration encouraged voluntary participation.

Permission was granted by HRDQ Organization Design and Development to use the Team Learning Survey. Data collection was accomplished by randomly selecting 500 of 1,090 nurses who work in teams at ABC Hospital. The researcher coded each survey to maintain confidentiality. After initial distribution, two follow-up letters were distributed to non-responding nurses three weeks apart. A drawing for a \$50 gift certificate (choice of restaurant or electronics store) was used as an incentive to complete and return the surveys to the researcher. All respondents were eligible to receive the gift certificate.

### ***Data Analysis***

Data were analyzed using SAS Institute, Version 8.2. The applicable statistical analyses were conducted around the following research questions and hypotheses:

**Research Question 1)** What are the gender, ethnic, professional degree, nursing longevity, salary, and age characteristics of nurses at ABC Hospital?

Descriptive statistics were used to characterize the sample of nurses with regard to gender, ethnicity, professional degree, nursing longevity, salary, and age.

**Research Question 2)** Do team learning processes, team learning conditions, organizational learning contributions and organizational learning conditions have an impact on team learning outcomes among nurses at ABC Hospital?

Ho 2.1: Among nurses at ABC Hospital, team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions have no impact on team learning outcomes.

Univariate statistics were run on all five variables (team learning processes, team learning conditions, organizational learning contributions, organizational learning conditions and team learning outcomes). The team learning outcomes category was used as the dependent

variable, and team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions were considered independent variables. All five team learning variables were considered continuous variables measured on an ordinal scale. Pearson correlation tests whether two or more continuous variables are related to one another (Hatcher & Stepanski, 1994). Pearson correlation was run to determine which of the four independent variables were significantly correlated with the dependent variable. Level of significance (alpha) was set at  $p < .05$ .

Where significant correlation was found, multiple regression analysis was used to establish the predictive value of the independent variables (team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions) with regard to the dependent variable (team learning outcomes). Multiple regression is a statistical technique used for exploring the strength of relationship between several independent variables (individually or in combination) and one dependent variable (Borg & Gall, 1996; Hatcher & Stepanski, 1994). Multiple regression analysis was chosen because a single dependent variable and two or more independent variables were assessed on a continuous (ordinal) scale. The results of the regression analysis were used to examine data for a multiple regression model. Based on the model results, additional tests were run and another research question was generated (see Research Question 3).

**Research Question 3)** Do team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions differ by ethnicity, gender, degree, full- vs. part-time work status, age, and salary?

Ho 3:1: The mean scores for team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning

contributions do not differ by ethnicity, gender, degree, full- vs. part-time work status, age, and salary.

Analysis of variance (ANOVA) was performed to analyze if the dependent variables (team learning variables) differ by the independent variables (ethnicity, gender, degree, full- vs. part-time work status, age, and salary). ANOVA is a statistical procedure that compares the amount of between-groups variance in individuals' scores with the amount of within-groups variance (Gall, Borg & Gall, 1996). ANOVA is an appropriate statistical procedure to use when there is "one categorical variable dividing the sample into three or more groups and one continuous variable" (Sims, 2000, p. 45).

ANOVA tests only for significant differences among the means. However, if differences are found, the ANOVA is not able to ascertain where the differences exist. Following an ANOVA, a Tukey test can be performed to locate the differences. A Tukey test is a multiple comparison statistical procedure that identifies significant pairwise differences among means (Hatcher & Stepanski, 1994). Like the ANOVA, the Tukey test is appropriate for categorical and continuous data that fall into different categories (Sims, 2000). In this study, ethnicity, gender, degree, full- vs. part-time work status, age and salary were considered categorical variables. The variables ethnicity, degree, age and salary each contain three or more categories. Variables gender and work status each contain two categories. The team learning variables are considered continuous variables. Level of significance (alpha) was set at  $p < .05$  for both the ANOVA and Tukey procedures.

**Research Question 4)** Is there a relationship among team learning processes, team learning conditions, organizational learning contributions, and nursing longevity, salary and age?

Ho 4.1: There is no linear relationship between team learning processes and nursing

longevity.

Ho 4.2: There is no linear relationship between team learning processes and salary.

Ho 4.3: There is no linear relationship between team learning processes and age.

Ho 4.4: There is no linear relationship between team learning conditions and nursing longevity.

Ho 4.5: There is no linear relationship between team learning conditions and salary.

Ho 4.6: There is no linear relationship between team learning conditions and age.

Ho 4.7: There is no linear relationship between organizational learning contributions and nursing longevity.

Ho 4.8: There is no linear relationship between organizational learning contributions and salary.

Ho 4.9: There is no linear relationship between organizational learning contributions and age.

To address research question four, team learning processes, team learning conditions, and organizational learning contributions were measured on an ordinal scale. Salary and age were considered categorical variables because they were grouped ordinally, and may not form normal distributions. Spearman's correlation coefficient was used since it is designed to measure linear association between the ranks of numeric variables which may not form normal distributions (Hatcher & Stepanski, 1994).

Specifically, Spearman correlation tests whether two variables are related to one another (Hatcher and Stepanski, 1994). The test does not indicate a cause and effect relationship. However, it does determine whether the variables move in the same or opposite directions. Positively correlated variables move in the same direction while negatively correlated

variables move in the opposite direction. Correlations are between -1 and 1. The closer the correlation coefficient is to -1 or 1, the stronger the correlation (Sims, 2000). Level of significance (alpha) was set at  $p < .05$ .

**Research Question 5)** Is there a relationship among organizational learning conditions, team learning outcomes and nursing longevity, salary and age?

Ho 5.1: There is no linear relationship between organizational learning conditions and nursing longevity.

Ho 5.2: There is no linear relationship between organizational learning conditions and salary.

Ho 5.3: There is no linear relationship between organizational learning conditions and age.

Ho 5.4: There is no linear relationship between team learning outcomes and nursing longevity.

Ho 5.5: There is no linear relationship between team learning outcomes and salary.

Ho 5.6: There is no linear relationship between team learning outcomes and age.

As in research question four, the same statistical approach was pursued in research question five. Organizational learning conditions and team learning outcomes were measured on an ordinal scale. Again, salary and age were considered categorical variables because they were grouped ordinally. Spearman's correlation coefficient is an appropriate measure of association for ordinal variables (Hatcher & Stepanski, 1994). Spearman correlation procedures were applied to each component of the variables organizational learning conditions, team learning outcomes, nursing longevity, salary and age. The primary purpose for the correlation procedure was to determine whether a significant relationship existed among the variables. Level of significance was set at .05.

In Chapter Four, the findings from the application of these statistical procedures will be presented as they address each of the research questions/hypotheses independently.

Summary tables for groups of variables are also presented. The information contained in Chapter 4 will provide the results of the statistical procedures introduced in this chapter.

Statistical procedures are used to support the purpose of this research which is to take an exploratory approach into the interaction of the team learning variables. Secondly, this study takes an already established work team and analyzes whether team learning theory is relevant to work and demographic variables. The nursing team at ABC Hospital was the team chosen for analysis.

## Chapter Four

### Presentation of Findings

The purpose of this study is twofold. First, this study examines the interaction of the team learning variables researched by Dechant, Marsick and Kasl (1993). Secondly, this study takes an already established work team to analyze whether team learning theory is applicable to work and demographic variables (ethnicity, gender, salary, age, professional degree, work status, and nursing longevity). The results of the study are presented as answers to each research question addressed in Chapter Three. SAS Institute version 8.2 was used in the analysis of all data. Of the 494 possible respondents, 179 nurses completed and returned surveys. Thus, a response rate of 36.2 percent was achieved.

#### *Characteristics of the Sample*

#### **Research Question 1) What are the gender, ethnic, professional degree, nursing longevity, salary, and age characteristics of nurses at ABC Hospital?**

Data were collected on the gender, ethnic, professional degree, nursing longevity, years of nursing at ABC Hospital, salary and age characteristics of the respondents. Data on gender, ethnicity, professional degree, salary and age were reported as categorical variables. Data on nursing longevity and years of nursing at ABC Hospital were reported as continuous variables.

Gender was reported as a categorical variable. Data were reported for 172 respondents, 96.09 percent of the total sample. Data were reported missing for 7 respondents or 3.91 percent of the sample. The missing data were the result of respondents not answering the gender item on the survey questionnaire. The sample of 179 was comprised of 160 females or 93.02 percent and 12 males or 6.98 percent of the sample (see Table 8).

Table 8  
Frequency Distribution of Respondents by Gender

	Gender	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Valid	Female	160	93.02	160	93.02
	Male	12	6.98	172	100
	Total	172	100		
Missing	Unknown	7	3.91		
Total		179			

Ethnicity was reported as a categorical variable. Data were reported for 168 nurses, 93.85 percent of the sample. Data were reported missing for 11 respondents or 6.15 percent of the sample, indicating 11 respondents did not answer the item regarding ethnicity. Ethnically, 138 nurses or 82.14 percent identified as Caucasian. African-Americans represented 13 nurses or 7.74 percent of the sample, while Asians accounted for 11 nurses or 6.55 percent of the sample. A total of 6 respondents or 3.6 percent identified individually as one of the following: African, Asian-Caucasian, Euro-American, Mid-Eastern, Mixed Heritage and Other (see Table 9).

Table 9  
Frequency Distribution of Respondents by Ethnicity

Ethnicity	Frequency	Percent	Cumulative Percent
Asian	11	6.55	6.55
African-American	13	7.74	14.29
African	1	.60	14.88
Asian-Caucasian	1	.60	15.48
Caucasian	138	82.14	97.62
Euro-American	1	.60	98.21
Mid-Eastern	1	.60	98.81
Mixed Heritage	1	.60	99.40
Other	1	.60	100.00
Missing Data	11	6.55	
Total	179		

Professional degree was reported as a categorical variable. Data were reported from 170 nurses, 94.97 percent of the sample. Data were reported missing for 9 respondents or 5.03 percent of the sample, indicating 9 nurses did not answer the item regarding professional degree. Of the 170 respondents, 106 nurses or 62.35 percent reported having earned Bachelor of Science Degrees. Those earning Associate Degrees represented 42 nurses or 24.71 percent of the sample. Of the respondents, 17 nurses or 10 percent reported having Diplomas in Nursing while 5 nurses or 2.94 percent reported having earned Master of Science Degrees (see Table 10).

Table 10  
Frequency Distribution of Respondents by Professional Degree

Professional Degree	Frequency	Percent
Associate Degree	42	24.71
Bachelor of Science	106	62.35
Diploma in Nursing	17	10.00
Master of Science	5	2.94
Missing Data	9	5.03
Total	179	

Survey respondents reported nursing longevity as a continuous variable (in years). Nursing longevity, the years of working as a nurse, were reported by 171 nurses or 95.53 percent of the sample. Missing data accounted for 8 nurses or 4.47 percent of the total sample. The missing data were a result of nurses failing to answer the item regarding nursing longevity. The descriptive analysis indicated that the number of years as a nurse ranged from as little as 3 months to as much as 36 years. The mean number of years spent as a nurse was 12.02 years. The average deviation from the mean was 9.89 years. Half of the respondents worked 10 years or more and half worked 10 years or less. The most frequently reported number of years respondents worked as a nurse was 3 years (see Table 11).

Table 11  
Summary Statistics for Respondents by Nursing Longevity

Variable	N	Min	Max	Mean	Median	Mode	Standard Deviation
Nursing Longevity	171	3 months	36 years	12.02 years	10 years	3 years	9.89 years
Missing data = 8							

The graphical representation for nursing longevity showed a highly skewed distribution (see Figure 5). The distribution is skewed to the left suggesting that more data falls on the lower end of the graph than on the upper end. The median is shifted away from the middle of the axis towards the lower end at 10 years. Such a shift indicates half the nurses had 10 years experience or less.

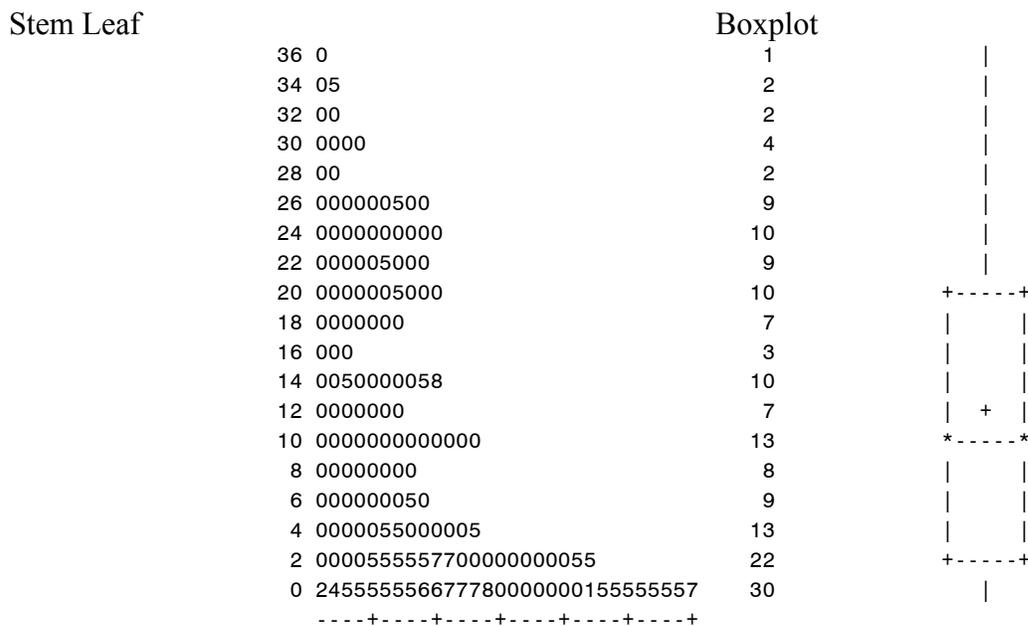


Figure 5. Stem and Leaf and Box Plots of nursing longevity.

Nursing years at ABC Hospital was reported as a continuous variable (in years). Data were reported on 170 respondents or 94.97 percent of the sample. Missing data accounted for 9 nurses or 5.03 percent of the sample. Work as a nurse at ABC Hospital ranged from as few as 3 months to as many as 40 years. The mean number of years of working as a nurse at ABC Hospital was 7.92 years. On average, the reported number of years for working as a nurse at ABC Hospital deviated from the mean by 8.13 years. In fact, half the nurses worked 4.5 years or more and half worked 4.5 years or less. The most frequently reported number of years that respondents worked as a nurse at ABC Hospital was 3 years (see Table 12).

Table 12  
Summary Statistics for Respondents by Years of Nursing at ABC Hospital

Variable	N	Min	Max	Mean	Median	Mode	Standard Deviation
Years of Nursing at ABC Hospital	170	3 months	40 years	7.92 years	4.5 years	3 years	8.13 years
Missing data = 9							

In examining the graphical representation of years of working as a nurse at ABC Hospital, data were skewed to the left. The majority of the nurses indicated they are relatively new nursing employees of ABC Hospital. A cluster of scores appeared between 3 months and 4.5 years which is consistent with the skewed distribution. The box plot shows there is much greater variation at the higher end of the graph which represents more years of nursing longevity at ABC Hospital. The box plot also depicts much lower variation for the nurses who are relatively new nursing employees at ABC Hospital (see Figure 6).



Table 13  
Frequency Distribution of Respondents by Employment Status

Employment Status	Frequency	Percent	Cumulative Percent
Full-Time	154	89.53	89.53
Part-Time	18	10.47	100.00
Missing Data	7	3.91	
Total	179		

Age was reported as a categorical variable. Age was grouped because it was made known to the researcher that nurses tend to better report age when they can select from age groups. Respondents were able to choose from 8 age ranges: 1) 20-24 years; 2) 25-29 years; 3) 30-34 years; 4) 35-39 years; 5) 40-44 years; 6) 45-49 years; 7) 50-54 years; and, 8) 55 years and above. Of the total sample, 20 respondents or 11.76 percent indicated an age of 20-24 years. The age group of 25-29 years consisted of 33 nurses or 19.41 percent of the sample. Twenty-four survey participants or 14.12 percent of the sample were within the age group of 30-34 years. The 35-39 year age range accounted for 18 nurses or 10.59 percent of the sample. Twenty-three nurses or 13.53 percent of the sample reported being between the ages of 40 and 44 years, while 27 respondents or 15.88 percent acknowledged being within the 45 to 49 age range. Twenty-five respondents or 14.71 percent indicated being 50 years or older. Missing data accounted for 9 nurses or 5.03 percent of the sample indicating respondents did not answer the item regarding age (see Table 14).

Table 14  
Frequency Distribution of Respondents by Age

Age Range	Frequency	Percent	Cumulative Percent
20-24 years	20	11.76	11.76
25-29 years	33	19.41	31.18
30-34 years	24	14.12	45.29
35-39 years	18	10.59	55.88
40-44 years	23	13.53	69.41
45-49 years	27	15.88	85.29
50-54 years	13	7.65	92.94
55 and above	12	7.06	100.00
Missing Data	9	5.03	
Total	179		

Annual salary was reported as a categorical variable. The reason for doing this was because it became known to the researcher that nurses tend not to indicate salary and age on survey questionnaires. Therefore, annual salary was presented in a categorical fashion to lessen the possibility of nurses failing to answer the item. There was a choice of eleven salary ranges from which respondents could indicate individual annual salary: 1) \$25,000 - \$29,999; 2) \$30,000 - \$34,999; 3) \$35,000 - \$39,999; 4) \$40,000 - \$44,999; 5) \$45,000 - \$49,999; 6) \$50,000 - \$54,999; 7) \$55,000 - \$59,999; 8) \$60,000 - \$64,999; 9) \$65,000 - \$69,999; 10) \$70,000 - \$74,999; and, 11) \$75,000 and above. Of the total sample, 163 respondents or 95.88 percent answered the item regarding salary. Missing data accounted for 16 nurses or 9.82 percent of the sample.

The salary range of \$25,000 - \$29,999 consisted of 4 nurses or 2.45 percent of the sample, while 15 participants or 9.20 percent indicated a salary between \$30,000 and \$34,999. Thirty-four respondents or 20.86 percent of the sample reported a salary within the range of \$35,000 to \$39,999. The \$40,000 to \$44,999 salary range had 27 nurses or 16.56 percent of the sample. Twenty-three nurses, or 14.11 percent, indicated a salary range of \$45,000 to \$49,999. Nineteen nurses or 11.66 percent reported a salary range of \$50,000 to \$54,999. The salary ranges of \$55,000 to \$59,999 and \$60,000 to \$64,999 each had 14 respondents or 8.59 percent of the nurses. The salary ranges of \$65,000 to \$69,999 and \$70,000 to \$74,999 each consisted of 5 nurses or 3.07 percent of the respondents. Three nurses or 1.84 percent of the sample accounted for respondents indicating a salary of \$75,000 and above (see Table 15).

Table 15  
Frequency Distribution of Respondents by Salary

Salary	Frequency	Percent	Cumulative Percent
\$25,000 - \$29,999	4	2.45	2.45
\$30,000 - \$34,999	15	9.20	11.66
\$35,000 - \$39,999	34	20.86	32.52
\$40,000 - \$44,999	27	16.56	49.08
\$45,000 - \$49,999	23	14.11	63.19
\$50,000 - \$54,999	19	11.66	74.85
\$55,000 - \$59,999	14	8.59	83.44
\$60,000 - \$64,999	14	8.59	92.02
\$65,000 - \$69,999	5	3.07	95.09
\$70,000 - \$74,999	5	3.07	98.16
\$75,000 and above	3	1.84	100.00
Missing Data	16		
Total	179		

***Summary of Descriptive Statistics***

The purpose for analyzing summary statistics was to describe the sample of respondents with respect to gender, ethnicity, professional degree, employment status, nursing longevity, years of nursing at ABC Hospital, salary and age. Respondents were primarily Caucasian females who are full-time nurses at ABC Hospital. Respondents have earned either Bachelor of Science or Associate Degrees. On average, respondents have been employed as a nurse for 12 years. Yet, respondents have been employed as a nurse at ABC Hospital for an average of 8 years. Most respondents earn between \$35,000 and \$39,999. With regard to

age, as age increases the number of nurses working at ABC Hospital decreases. In fact, there were fewer nurses reporting an age of 50 years and older than any other age group.

**Research Question 2: Do team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions have an impact on team learning outcomes among nurses at ABC Hospital?**

Ho 2.1: Among nurses at ABC Hospital, team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions have no impact on team learning outcomes.

### ***Overview of Multiple Regression Analysis***

Dechant, Marsick and Kasl (1993) identify five team learning variables, all of which are examined in this study. For each team learning variable (team learning processes, team learning conditions, organizational learning contributions, organizational learning conditions, and team learning outcomes), a seven-point Likert scale was used to examine the differentiation in responses. Thus, each team learning variable was considered a continuous variable measured on an ordinal scale. The rationale for measuring the variables on an ordinal scale is primarily for two reasons. First, equal differences on the seven point Likert scale do not necessarily denote equal quantitative meaning. Secondly, data for each team learning variable was distributed normally. Therefore, measuring on an ordinal scale is the appropriate scale of measurement (Hatcher & Stepanski, 1994).

It should be noted that two variables, team learning conditions and organizational learning conditions, each contain subcategories. The team learning conditions variable contains the three subcategories of 1) appreciation of teamwork, 2) individual expression and 3) operating principles. The organizational learning conditions variable contains the two subcategories of 1) support for the operation of teams, and 2) support for collaboration within

the organization. An explanation of all five team learning variables, including all five subcategories, is explained during each respective analysis.

To answer research question two using a multiple regression technique, the following process was followed. First, after examining univariate statistics, bivariate and multivariate analyses were performed. This included examining scatter plots to look for relationships between the independent and dependent variables. Secondly, a test of correlation was conducted to look for linear relationships between the independent and dependent variables as well as linear relationships between the independent variables. Linear relationships were evaluated to determine the strength of the relationship. Level of significance was established at .05.

The information derived from scatter plots and correlations was used to hypothesize an initial model. Next, multiple regression testing techniques were used to determine which variables are most useful in predicting the dependent variable. The findings of a multiple regression model generated further inquiry. That inquiry resulted in an additional research question involving analysis of variance (ANOVA) statistical procedures (see Research Question 3).

ANOVA procedures were used to examine the differences among variables based on characteristics. ANOVA was used because it compares the average responses for different groups (Sims, 2000). Following the ANOVA computation, a Tukey test was run. A Tukey test determines where the group differences are significant (Sims, 2000). Level of significance was set at .05. The multiple regression process is compartmentalized into the following sections: univariate statistics, bivariate and multivariate analysis, scatter plots, tests of correlation, and hypothesizing a model.

### ***Univariate Statistics: Team Learning Variables***

Univariate statistics were run to provide information about each team learning variable: team learning processes, team learning conditions, organizational learning contributions, and team learning outcomes (see Table 16). Since two variables (team learning conditions and organizational learning conditions) have subcategories univariate statistics were also performed on the subcategories. Specifically, for the team learning conditions variable, univariate statistics were performed on appreciation of teamwork, individual expression and operating principles. For the organizational learning conditions variable, univariate statistics were conducted on support for the operation of teams, and support for collaboration within the organization.

Table 16  
Univariate Statistics for Team Learning Variables

Variable	N	Min	Max	Mean	Median	Mode	Standard Deviation
<b>Team Learning Processes</b>	179	35	110	82.58	84	83	14.40
<b>Team Learning Conditions:</b>	179	44	109	77.44	80	80	12.03
Appreciation of Teamwork	179	11	56	42.65	44	52	8.13
Individual Expression	179	3	21	10.58	10	7	4.64
Operating Principles	179	4	35	24.22	25	24	5.66
<b>Organizational Learning Contributions</b>	179	12	55	37.96	39	44	7.55
<b>Organizational Learning Conditions:</b>	179	28	81	57.50	59	62	9.82
Support for Teams	179	8	49	32.88	34	35	9.05
Support for Collaboration	179	14	38	24.62	24	24	4.47
<b>Team Learning Outcomes</b>	179	10	49	35.64	37	39	7.31

### ***Team Learning Processes***

The team learning processes variable measures the extent to which team members modify their thoughts and behaviors based on information learned from other team members. Data were reported on 179 respondents or 100 percent of the sample. The mean score for team learning processes was 82.58, scoring within the synergistic category (81 to 112) (see Table 17). The synergistic category indicates the nursing team jointly constructs shared meanings, assumptions, and language which lead to consensually developed solutions, positions, and recommendations. Scores deviated from the mean by 14.40 points. This is a rather large standard deviation in comparison to some of the other variables. This suggests that the data was much more spread out for team learning processes, especially in comparison to the other team learning variables such as organizational learning contributions ( $s = 7.55$ ). The median was 84, indicating half the respondents scored above 84 and half below. The mode, the score reported most frequently, was 83. All three measures of central tendency, the mean, median, and mode, fell within the synergistic domain. This supports the conclusion that nurses modify their thoughts and behaviors based on information they learn from others.

Table 17  
Scores for Team Learning Processes Variable

Variable	Possible Scores	Unfavorable	Neutral	Favorable	ABC Nurse Score
Team Learning Processes	16-112	16-68 (fragmented)	69-80 (pooled)	81-112 (synergistic)	82.58

N=179

### ***Team Learning Conditions***

The team learning conditions variable measures a team's ability to learn and to generate learning outcomes. The team learning conditions variable is divided into three categories: 1) Appreciation of Teamwork, 2) Individual Expression, and 3) Operating Principles. For each category, data were reported by 179 respondents or 100 percent of the sample.

*Appreciation of Teamwork.* The appreciation of teamwork variable measures the extent to which nurses hear, consider, and appreciate other nurses' ideas and viewpoints. The mean score was 42.65 falling within the favorable range (40 to 56) (see Table 18). The favorable range indicates nurses are open to learning from, considering and appreciating differing views from both inside and outside the team. On average, scores deviated from the mean by 8.13 points, indicating a moderate spread of the data. The median score was 44 while the most frequently observed score was 52. Both the median and the mode fall within the favorable range. This suggests that nurses are open to considering opposing or differing views from inside and outside the team.

*Individual Expression.* The individual expression category measures the extent to which individual members have the opportunity to contribute to the team's mission and influence the team's progression. The mean score was 10.58 which falls on the borderline of the unfavorable/neutral range (see Table 18). Scores for the unfavorable category range from 3 to 10, and scores for the neutral category range from 11 to 14. Unfavorable category scores indicate comments and contributions are not taken seriously, and the direction the group pursues is not based on team consensus. With a team score slightly above unfavorable but not close to the favorable category, it appears for the most part that nurses' individual contributions and comments are limited. That is, nurses do not perceive themselves as having the opportunity to openly contribute to the team's mission and influence the team's

progression. On average, scores deviated from the mean by 4.64 points. The deviation is relatively small, indicating there was not a lot of variation among responses from the nursing staff at ABC Hospital. With the median score of 10 and the mode of 7 both falling within the unfavorable range, the overall typical response for this category is unfavorable. These scores suggest nurses could benefit from having more opportunities to openly offer comments regarding the direction they desire to pursue as a team.

*Operating Principles.* The operating principles category reflects the extent to which the team effectively and efficiently operates. The mean score was 24.22, scoring within the favorable range (20 to 35) (see Table 19). Teams with scores within the favorable range are able to balance task accomplishment with relationship building. They are also able to collectively establish commonly held beliefs, values, purpose and structure. A small to moderate amount of spread is observed within the data as the scores deviated from the mean by 5.66 points. The median of 25 is reasonably close to the mean. These scores support the conclusion that overall, the typical response fell within the favorable range. These scores indicate the nursing team at ABC Hospital is able to function from a shared set of guidelines, principles, and norms, despite whether they are provided opportunities to openly offer their positive and/or critical comments.

Table 18  
Scores for Team Learning Conditions Subcategories: Appreciation of Teamwork, Individual Expression, and Operating Principles

Variable	Possible Scores	Unfavorable	Neutral	Favorable	ABC Nurse Score
Appreciation of Teamwork	8-56	8-33	34-39	40-56	42.65
Individual Expression	3-21	3-10	11-14	15-21	10.58
Operating Principles	5-35	5-13	14-19	20-35	24.22

n=179

***Organizational Learning Contributions***

Organizational learning contributions measure the extent to which the outcome of a team’s work is shared inside and outside the team, and transfers to organizational learning. For the organizational learning contributions variable, data were reported on 179 respondents or 100 percent of the sample. The mean score of 37.96 falls within the neutral range (32-39) (see Table 19). Scores within the neutral range indicate a somewhat limited degree of passing information from the teams to the organization. On average, scores deviated from the mean by 7.55 points which is a moderate spread. The median score was 39 and falls on the outer edge of the neutral category, close to the favorable range. The mode of 44 falls within the favorable category. These scores tended to cluster toward the upper end of the neutral category and into the favorable category. These results suggest the nursing administration or ABC Hospital could consider being more open to the collective learning

which occurs in teams and is accepted by the larger organization. The scores signify the team is learning but the team has difficulty passing its learning to the organization.

Table 19  
Scores for Organizational Learning Contributions

Variable	Possible Scores	Unfavorable	Neutral	Favorable	ABC Nurse Score
Organizational Learning Contributions	8-56	8-31	32-39	40-56	37.96
n=179					

***Organizational Learning Conditions***

The organizational learning conditions variable measures the extent to which the outcome of a team’s work is accepted by the organization. For the organizational learning conditions variable, data were reported on 179 respondents or 100 percent of the sample. The organizational learning conditions variable is subcategorized into two categories: 1) support for operation of teams and 2) support for collaboration within the organization.

*Support for Operation of Teams.* The support for operation of teams variable measures the degree to which managers are supportive and tolerant of teamwork. The mean score for the variable was 32.88, falling within the neutral range (27 to 34) (see Table 20). Neutral range scores indicate the conditions that impede learning are generally absent. However, neutral range scores also indicate that learning could be more progressive if support for teams improved. As evidenced by the organizational learning contributions variable, although the mean fell in the neutral range, the median of 34 fell at the upper limit of the neutral category. The mode of 35 fell in the favorable category. This suggests overall neutrality although

leaning more toward the favorable than the unfavorable category. These scores indicate managers could be more open to the team output even if the output challenges existing norms or practices.

*Support for Collaboration within the Organization.* The support for collaboration within the organization variable measures the extent to which the organization values and rewards sharing throughout the entire organization. The mean score for support for collaboration within teams was 24.62, falling within the neutral zone (18 to 25). Neutral scores suggest the conditions to learn are not impeded but learning could be taking place more rapidly and at deeper levels if the organization better embraced collaborative work efforts. The median score for this variable, 24, also fell within the neutral area, providing further evidence that nurses at ABC Hospital could be learning more if the hospital more openly endorsed learning among nurses (see Table 20).

Table 20  
Scores for Organizational Learning Conditions

Variable	Possible Scores	Unfavorable	Neutral	Favorable	ABC Nurse Score
Support for Operation	7-49	7-26	27-34	35-49	32.88
Support for Collaboration	6-42	6-17	18-25	26-42	24.62

n=179

### ***Team Learning Outcomes***

The team learning outcomes variable measures team members' collective assessment of how well the group is learning and functioning as a whole. Data were received from 179 respondents or 100 percent of the sample. The mean was 35.64 indicating a score within the favorable range (32 to 49) (see Table 21). Scores deviated from the norm by 7.31 points, which is a moderate spread of data. The median of 37 and the mode of 39 support scores within the favorable category. The favorable range indicates nurses have achieved a high degree of collective learning as a result of their working together.

Table 21  
Team Learning Outcomes

Variable	Possible Scores	Unfavorable	Neutral	Favorable	ABC Nurse Score
Team Learning Outcomes	7 - 49	7 - 23	24-31	32-49	35.64

N=179

### ***Bivariate and Multivariate Analyses***

Following analysis of the univariate statistics, scatter plots were constructed to observe whether linear relationships exist between the dependent variable (team learning outcomes), and the independent variables (team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions). After the removal of two outliers, the scatter plots revealed a linear relationship between team learning outcomes and team learning processes, team learning conditions, organizational learning

contributions, and organizational learning conditions (see Figures 7, 8, 9, and 10.) An explanation of the pictorial representations of Figures 7, 8, 9 and 10 is in the Scatter Plots Section following the figures.

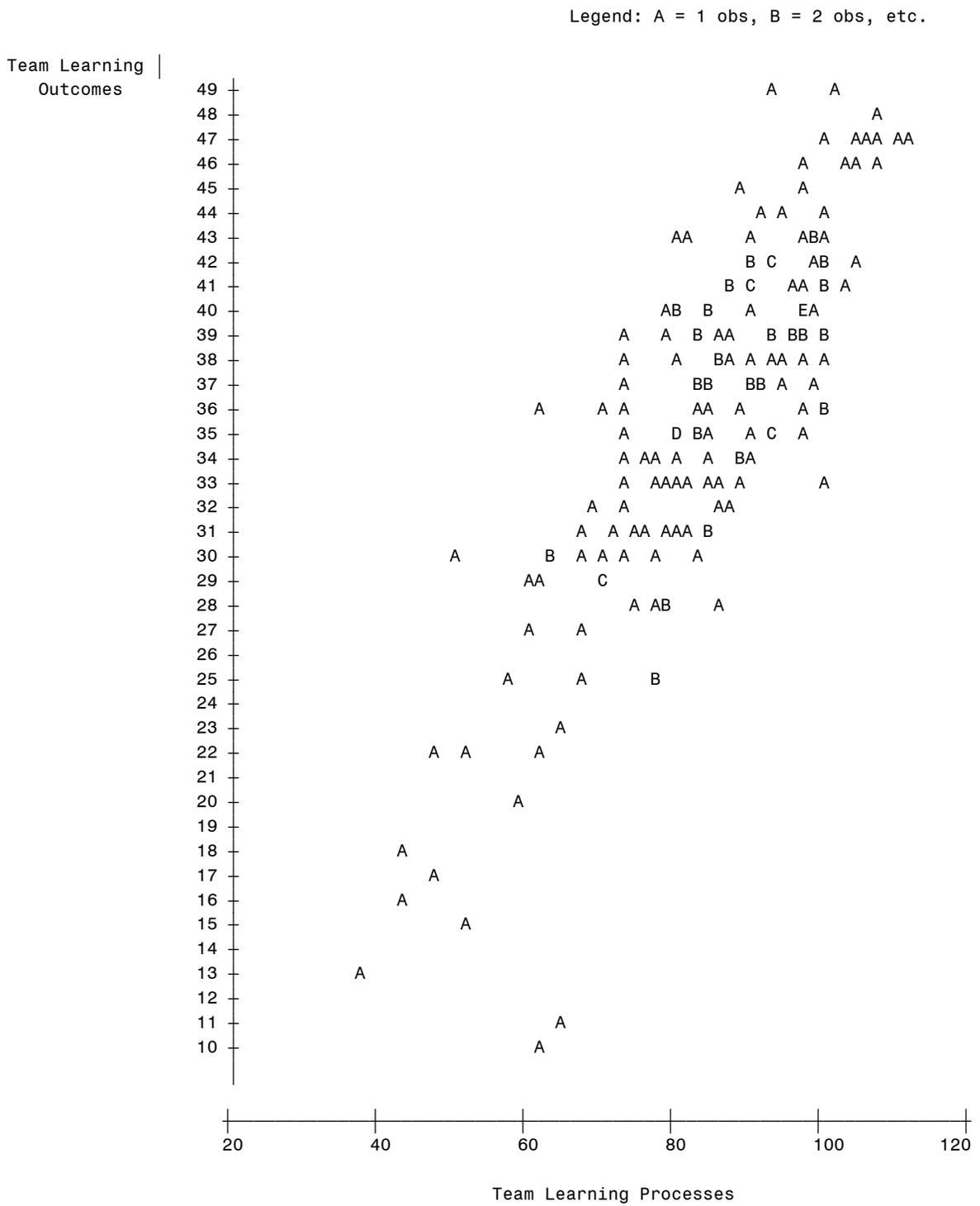


Figure 7. Linear relationship between Team Learning Outcomes and Team Learning Processes.

Legend: A = 1 obs, B = 2 obs, etc.

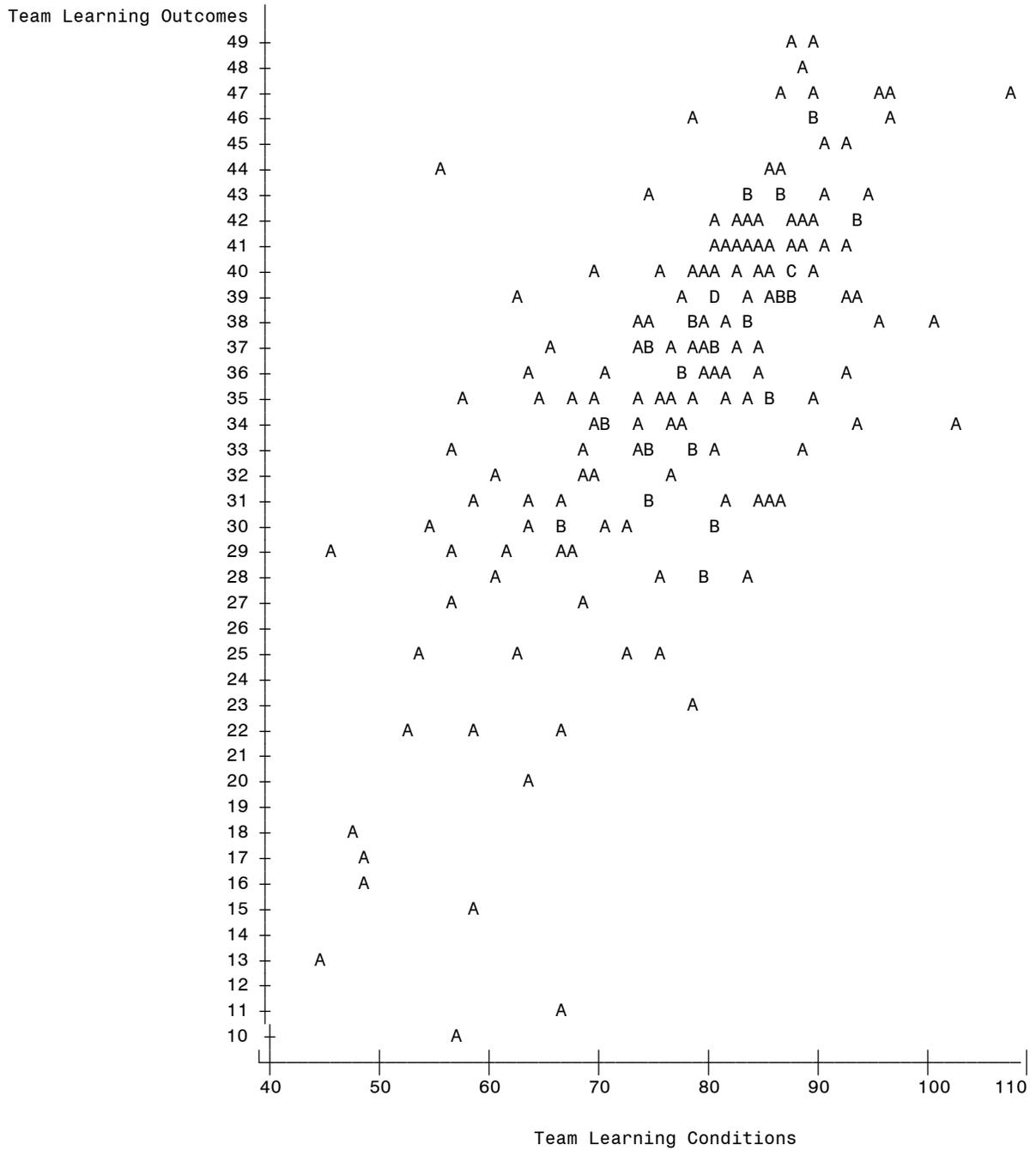


Figure 8. Linear relationship between Team Learning Outcomes and Team Learning Conditions.

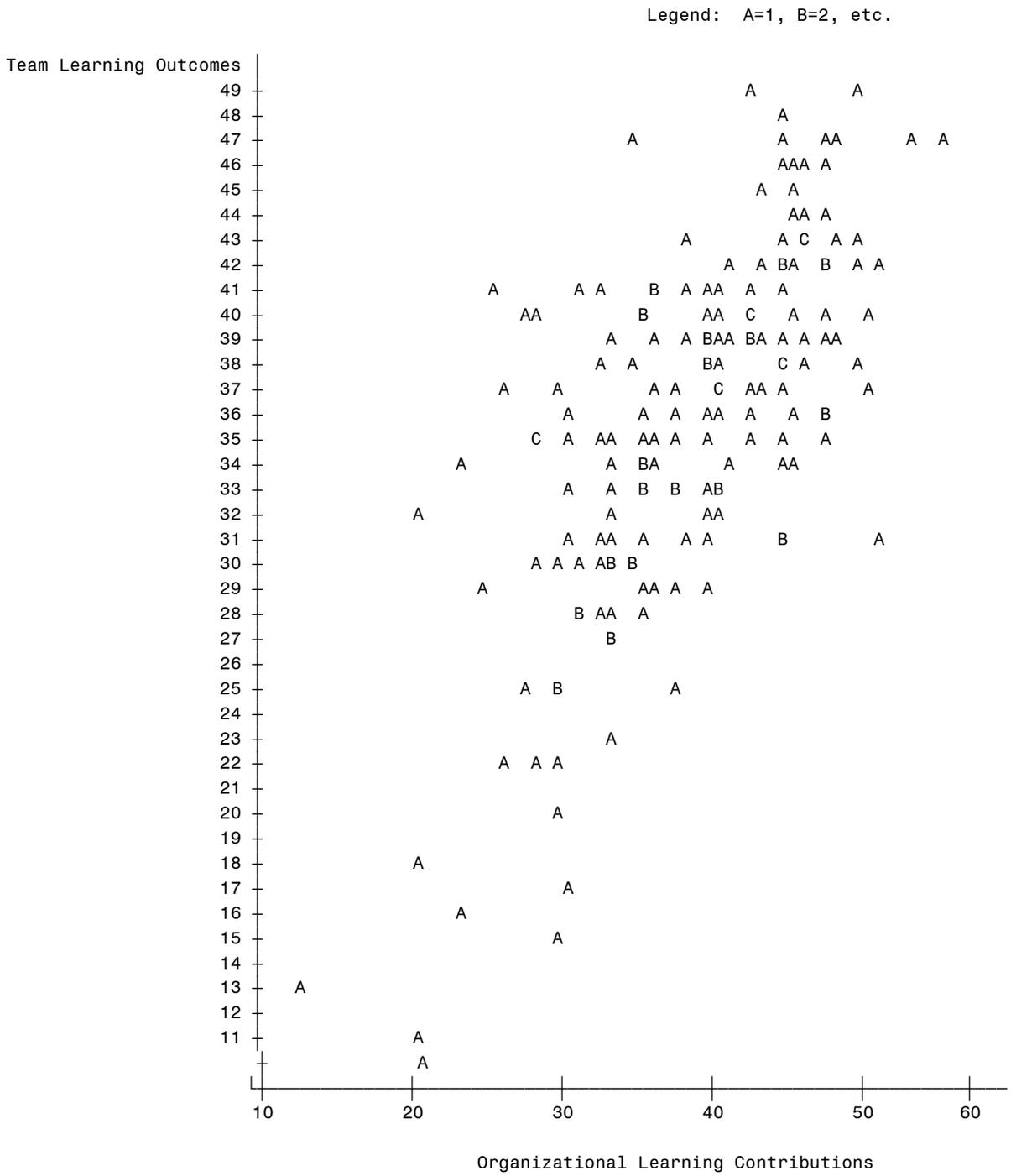


Figure 9. Linear relationship between Team Learning Outcomes and Organizational Learning Contributions.

Legend: A = 1 obs, B = 2 obs, etc.

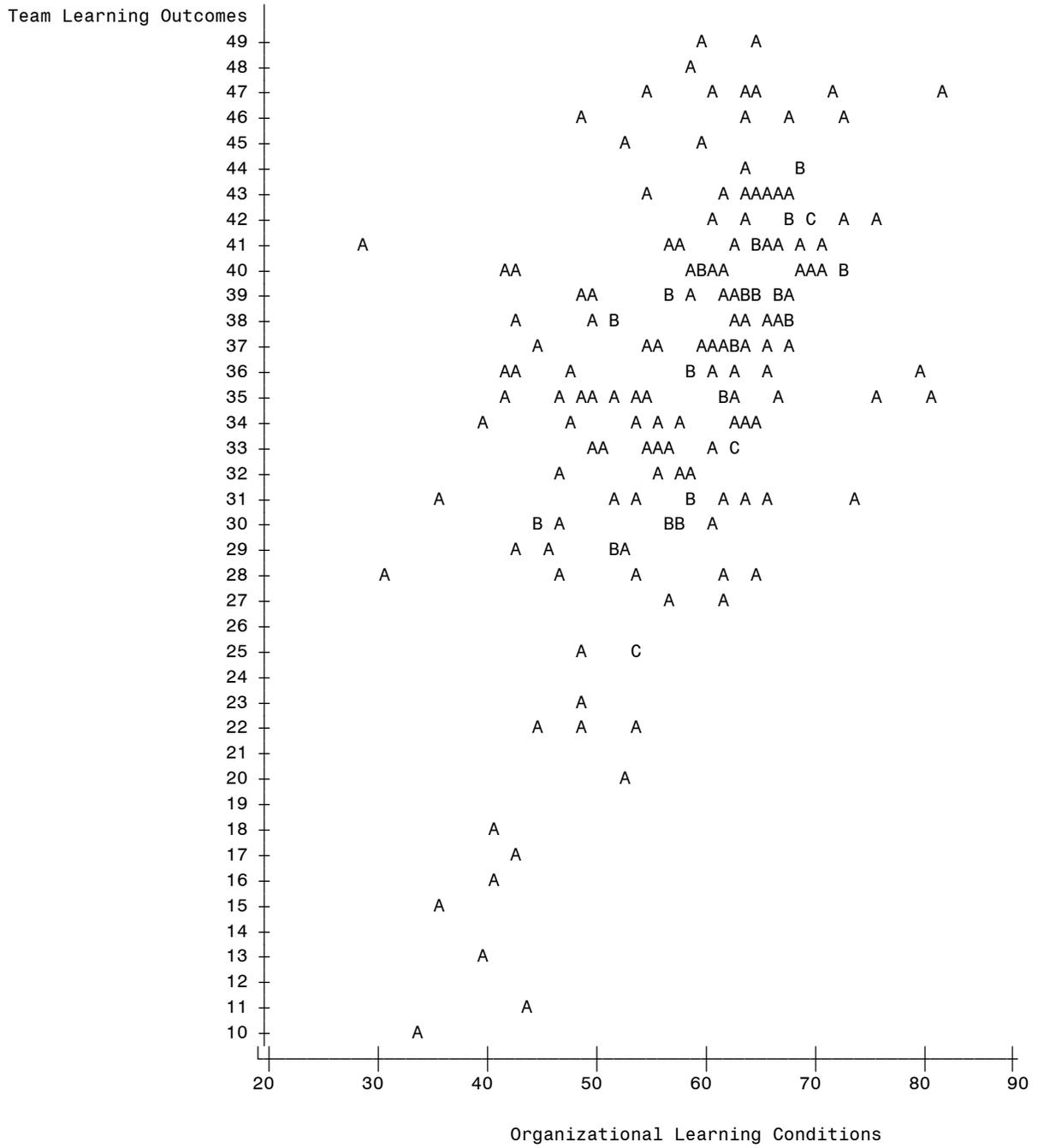


Figure 10. Linear relationship between Team Learning Outcomes and Organizational Learning Conditions.

### ***Scatter Plots***

The graphs helped in hypothesizing a starting model for multiple regression. All four graphs show a strong linear relationship between the independent variables (team learning processes, team learning conditions, organizational learning conditions, and organizational learning contributions) and the dependent variable (team learning outcomes) (see Figures 7, 8, 9, and 10). The weakest of the four variables appears to be organizational learning conditions. Although strongly linear, organizational learning conditions and organizational learning contributions had a hint of curvature, suggesting that the initial regression model should allow for some curvature. Hence, organizational learning conditions and organizational learning contributions were included as quadratic variables in the first hypothesized model.

### ***Test of Correlation***

To explore the initial indication of the scatter plots, a test of correlation was computed for the four independent variables (team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions) and the dependent variable (team learning outcomes) (see Table 22). The primary purpose of the correlation procedure was to determine whether significant correlation existed between the variables. Pearson correlation was used because the continuous data was near normal distribution (Hatcher & Stepanski, 1994).

Pearson correlation tests whether two variables are related to one another. The test does not indicate a cause and effect relationship. However, it does determine whether the variables move in the same or opposite directions. Positively correlated variables move in the same direction while negatively correlated variables move in the opposite direction.

Correlations are between -1 and 1. The closer the correlation coefficient is to -1 or 1, the stronger the correlation (Sims, 2000). Level of significance was established at .05.

Table 22  
Pearson Correlation for Team Learning Variables

	<b>Team Learning Outcomes</b>	<b>Team Learning Processes</b>	<b>Team Learning Conditions</b>	<b>Organizational Learning Contributions</b>	<b>Organizational Learning Conditions</b>
<b>Team Learning Outcomes</b>	1.00000	r = 0.83683 p<.0001	r =0.71517 p<.0001	r = 0.66272 p<.0001	r = 0.51061 p<.0001
<b>Team Learning Processes</b>	r = 0.83683 p<.0001	1.00000	<b>r =0.78584</b> P<.0001	<b>r =0.66868</b> p<.0001	<b>r = 0.54726</b> p<.0001
<b>Team Learning Conditions</b>	r = 0.71517 p<.0001	r = 0.78584 p<.0001	1.00000	<b>r =0.56738</b> p<.0001	<b>r = 0.44915</b> p<.0001
<b>Organizational Learning Contributions</b>	r = 0.66272 p<.0001	r = 0.66868 p<.0001	r =0.56738 p<.0001	1.00000	<b>r = 0.66132</b> p<.0001
<b>Organizational Learning Conditions</b>	r = 0.51061 p<.0001	r = 0.54726 p<.0001	r =0.44915 p<.0001	r = 0.66132 p<.0001	1.00000

N= 177. Bold items reflect multicollinearity.  
 p = probability value. r = correlation coefficient.

The results showed that all four independent variables (team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions) were significantly correlated with the dependent variable (team learning outcomes) (p< .0001). Additionally, each of the independent variables were correlated with each other, suggesting a multicollinearity issue for multiple regression.

Multicollinearity advises that variables are providing similar and some overlapping information to the dependent variable (Mendenhall & Sincich, 1996). The correlation coefficients are used to determine the strength of the overlap. In this data, a moderate to strong overlap is viewed. The overlap is not too great in the correlation of organizational

learning conditions versus team learning conditions, as  $r = .45$ . Since the overlap is not too strong, both variables (organizational learning conditions and team learning conditions) can be considered for inclusion in a model which best explains the dependent variable (team learning outcomes). At other times, the correlation between independent variables is so strong that they essentially provide similar or overlapping information to the dependent variable. For example, in the correlation of team learning conditions and team learning processes,  $r = .79$  suggests a moderate/strong overlap of information being provided to the dependent variable. The strong overlap indicates both variables may not be needed in a model. Other variables have correlation coefficient values between .45 and .67, suggesting a moderate overlap. To determine which variables should be included in a model, the researcher hypothesized a regression model.

### ***Hypothesizing the Initial Model***

To hypothesize a starting model, each independent variable was graphed against the dependent variable. As stated previously, team learning processes and team learning conditions showed a linear relationship with team learning outcomes. Organizational learning conditions and organizational learning contributions both suggested a possible quadratic relationship with team learning outcomes.

The first hypothesized model included team learning outcomes being regressed by team learning processes, team learning conditions, organizational learning contributions, organizational learning conditions, organizational learning contributions (squared), and organizational learning conditions (squared). Statistically, the model was comprised as follows: Team Learning Outcomes =  $-5.46647 + 0.29096$  (team learning processes) +  $0.08496$  (team learning conditions) +  $-0.03854$  (organizational learning contributions) +  $0.30264$  (organizational learning conditions) +  $0.00280$  (Organizational Learning

Contributions<sup>2</sup>) + -0.00278 (Organizational Learning Conditions<sup>2</sup>). Organizational learning contributions and organizational learning conditions were squared because the scatter plots suggested a potential curve. Hence, the squaring of the variables allowed for curvature in the regression model. After hypothesizing a starting model, a test of model utility was performed (Mendenhall & Sincich, 1996). A test of model utility examines if at least one variable was significant and that the model was useful  $F(6, 170)=75.93, p<.0001, R^2 = .7283$  (see Table 23). With a significant p-value ( $p<.0001$ ) it has been established that at least one variable is useful in predicting team learning outcomes.

Table 23  
Analysis of Variance for Team Learning Outcomes

<b>Model: Model 1</b>					
<b>Dependent Variable: Team Learning Outcomes</b>					
<b>Analysis of Variance</b>					
<b>Source</b>	<b>DF</b>	<b>Sum of Squares</b>	<b>Mean Square</b>	<b>F Value</b>	<b>Pr &gt; F</b>
<b>Model</b>	6	5992.76044	998.79341	75.93	<.0001
<b>Error</b>	170	2236.13221	13.15372		
<b>Corrected Total</b>	176	8228.89266			
<b>Root MSE</b>		3.62681	<b>R-Square</b>		0.7283
<b>Dependent Mean</b>		35.92090	<b>Adjusted R-Square</b>		0.7187
<b>Coefficient Var</b>		10.09664			

Once it was determined that the model is useful, variables were tested in small groups.

The reason for the testing is to reduce the overall number of hypothesis tests performed since the more tests performed the greater the chance of making a Type I error (rejecting the null

hypothesis when it was really true). The nested F test permits testing curvature of two or more variables at a time (Mendenhall & Sincich, 1996). In this case, the purpose of the nested F was to determine if the quadratic variables (organizational learning contributions squared and organizational learning conditions squared) should be included in the model. In other words, to determine if a second order model (a model that contained the two squared terms) was preferred over a first order model (a model that did not contain the two squared terms).

The results of the nested F yielded an  $F(2, 170) = .69$  with a p-value = .50 indicating the reduced model or first order model was better. Since the p-value of .50 exceeds the significance level of .05, the conclusion is made to reject the complete model and accept the reduced model. The reduced model contains the following four variables: team learning processes, team learning conditions, organizational learning conditions and organizational learning contributions. Once the quadratic variables were removed, an improvement was seen in the overall F,  $F(4, 172) = 113.97$ ,  $p < .0001$ .

Next, individual team learning variables were tested via t-tests. T-tests are performed to analyze a single variable (Mendenhall & Sincich, 1996). A t-test tests to see if there is enough support to indicate a parameter differs from a pre-determined value. The variable with the highest p-value was tested first (Mendenhall & Sincich, 1996). In this case, a t-test was performed on organizational learning conditions. The test statistic of  $-0.07$  and a p-value = .9451 required the removal of the organizational learning conditions variable from the model because the p-value exceeded the cut-off of a .05 level of significance (see Table 24).

Table 24  
Multiple Regression for Independent Variables - Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t-value	p-value
Intercept	1	-0.48526	2.02317	-0.24	0.8107
Team Learning Processes	1	0.29462	0.03468	8.50	<.0001
Team Learning Conditions	1	0.07496	0.03705	2.02	0.0446
Organizational Learning Contributions	1	0.16620	0.05694	2.92	0.0040
Organizational Learning Conditions	1	-0.00265	0.03843	-0.07	0.9451

The remaining variables (team learning processes, team learning conditions, and organizational learning contributions) were all significant at the .05 level (See Table 25).

Table 25  
Multiple Regression – T-test of Significance for Organizational Learning Conditions

Independent Variable	T	p-value	Result	Partial R-square
Team Learning Processes	8.50	p<.0001***	Kept	.7003
Team Learning Conditions	2.02	p=.0446**	Kept	.0192
Organizational Learning Contributions	2.92	p=.0040***	Kept	.0065
Organizational Learning Conditions	-.07	p=.9451	Removed	

\*\*\*significant at .01 level.

\*\* significant at .05 level.

The final model of  $-0.53967 + 0.29427$  (team learning processes)  $+ 0.07498$  (team learning conditions)  $+ 0.16434$  (organizational learning conditions) was retained. The model containing these three independent variables is able to explain 73 percent of the sample variation in team learning outcomes.

Stepwise analysis examines a regression model at each step and determines how each variable is contributing to the process (Mendenhall & Sincich, 1996). By examining partial r-square values obtained from stepwise analysis, it should be noted that the team learning processes variable alone explains 70 percent of the 73 percent sample variation (see Table 26). The other two variables are only able to add an additional 3 percent to a model that already contains team learning processes. This can be contributed to the fact that all four of the independent variables were highly correlated with each other and are providing similar information. The standard deviation for the model is 3.61 indicating that it is expected that most of the observed team learning outcomes scores fall within 7.22 points of their least squares predicted values (Mendenhall & Sincich, 1996).

Table 26  
Partial R Squares and Percentages for Regression Model

Independent Variable	Partial R-Square	Percentage added to the Model
Team Learning Processes	.7003	.7003 = 70%
Organizational Learning Contributions	.7195	.0192 = 1.92%
Team Learning Conditions	.7261	.0066 = .66%

A residual analysis was performed to confirm whether any additional outliers exist, and to check the fit of the model and model assumptions. There are three model assumptions: 1) errors form a normal distribution with a mean of zero; 2) variance of errors is constant; and 3) errors are independent. A model was run and the plot of the residuals versus the predicted values yielded two outliers. The model confirmed the initial removal of the two outliers that were on the plots of the dependent variable versus each of the independent variables. The removal of the two outlying values provided a better fit to the model. Additionally, the plot indicated that the assumption of constant variance was reasonably met. A histogram of the residuals indicated that the residuals were normally distributed with a mean of zero. Finally, a lack of fit test was run and did not indicate any lack of fit problems with the model.

This analysis was used to answer the research question, “Do team learning processes, team learning conditions, organizational learning contributions and organizational learning conditions have an impact on team learning outcomes among nurses at ABC Hospital?” The results of the multiple regression revealed a significant effect,  $F(3, 173) = 152.83$ ;  $p < .0001$ ,  $R^2 = .73$ . Therefore, the null hypothesis is rejected. Three of the four independent variables (team learning processes, team learning conditions, and organizational learning contributions) were retained in the model to help predict team learning outcomes. The model containing these variables is able to explain 73 percent of the sample variation in team learning outcomes. However, it is noted that the team learning processes variable alone explains 70 percent of the 73 percent sample variation.

One purpose of this research study is to examine team learning within an established team. The team chosen for investigation was nurses at ABC Hospital. The results of a multiple regression analysis showed the three variables (team learning processes, team learning conditions, and organizational learning contributions) which remained in the model

were highly significant ( $p < .0001$ ). To further analyze these results, an examination of characteristics ethnicity, gender, professional degree, age, salary, and work status was conducted on the highly significant team learning variables (see Research Question 3). The reason for the examination was threefold. First, the examination was to determine whether either of these groups differed in responding to the team learning variables. Secondly, the examination was to determine the extent of the difference, if any, between the groups with respect to the variables. Third, the results can add to the empirical base of understanding theory about team learning.

**Research Question 3) Do team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions differ by ethnicity, gender, degree, full- vs. part-time work status, age, and salary?**

Ho 3:1: The mean scores for team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions do not differ by ethnicity, gender, degree, full- vs. part-time work status, age, and salary.

#### **ANOVA and Tukey**

As a reminder, team learning processes measure the extent to which team members modify their thoughts and behaviors based on information learned from other team members. Team learning conditions measure a team's ability to learn and to generate learning outcomes. Team learning outcomes measure team members' collective assessment of how well the group is learning and functioning as a whole. Organizational learning conditions measure the factors that influence the operation of teams, and determine the extent to which the outcome of a team's work is accepted by the organization. Organizational learning

contributions measure the extent to which the outcome of a team's work is shared inside and outside the team, and transfers to organizational learning.

Analysis of variance (ANOVA) was performed to analyze if the dependent variables (team learning variables) differ by the independent variables (ethnicity, gender, degree, full- vs. part-time work status, age, and salary) (see Table 27). ANOVA was used because it compares the average responses for different groups (Sims, 2000). Level of significance was set at  $p < .05$ .

Overall, the only characteristic that showed significance was ethnicity: Team learning conditions and ethnicity,  $p = .0236$ ; organizational learning contributions and ethnicity,  $p = .0053$ ; organizational learning conditions and ethnicity,  $p = .0088$ ; and, team learning outcomes and ethnicity,  $p = .0304$ . This indicates that there were significant differences in the mean scores for team learning conditions, organizational learning contributions, organizational learning conditions, and team learning outcomes for different ethnicities. The mean scores for team learning processes did not differ by the independent variables. Also, there were no significant differences found for any of the team learning variables based on age, degree, gender, employment status (part-time or full-time), or salary.

Table 27

Analysis of Variance for Team Learning Variables by Ethnicity, Gender, Degree, Employment, Age and Salary

	Ethnicity	Gender	Degree	Part-time vs. Full-time	Age	Salary
Team Learning Processes	F = .69 P = .5589	F =.77 P =.3820	F =.32 P =.8077	F =.23 P =.6350	F =.72 P =.6584	F =1.09 P =.3738
Team Learning Conditions	F = 3.24 P=.0236**	F =.95 P =.3320	F =.64 P =.5926	F =.15 P =.6972	F =.62 P =.7409	F =1.03 P =.4231
Organizational Learning Contributions	F =4.39 P =.0053**	F =3.08 P =.0813*	F =.29 P =.8319	F =.57 P =.4532	F =.52 P =.8153	F =1.26 P =.2563
Organizational Learning Conditions	F =4.01 P =.0088**	F =3.66 P =.0574*	F =.30 P =.8242	F =.04 P =.8389	F =1.40 P =.2091	F =1.20 P =.2948
Team Learning Outcomes	F =3.05 P =.0304**	F =2.47 P =.1176	F =.29 P =.8319	F =.57 P =.4532	F =.52 P =.8153	F =1.26 P =.2563

\*\* significant at .05 level. \* significant at .10 level.  
p = probability value. F = F-ratio

The ANOVA only showed that at least one difference exists but does not tell which ethnicities show the difference in scores (Sims, 2000). A follow-up test, called a Tukey test, was performed to determine where the significant differences exist (Sims, 2000). The Tukey test was run to look for individual differences for ethnicity against team learning conditions, organizational learning contributions, organizational learning conditions, and team learning outcomes. The Tukey results indicated there were significant differences at the .05 level of significance for team learning conditions and organizational learning contributions against

ethnicity. There were also significant differences at the .10 level of significance for gender versus organizational learning contributions and organizational learning conditions. Since the cut-off level of significance was established at .05, no further analysis was conducted regarding the variables that were significant at the .10 level of significance.

ANOVA and Tukey analyses were conducted to answer the research question, “Do team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions differ by ethnicity, gender, degree, full- vs. part-time work status, age, and salary?” It is appropriate to reject the null hypothesis. The average scores for team learning conditions (team’s ability to learn and to generate learning outcomes) were significantly different for Asians and Caucasians. The difference in means was 10.29 points. At a 95 percent confidence level, the average scores for team learning conditions of Asians fall between .697 and 19.884 points higher than those of Caucasians. The average scores for organizational learning contributions (the extent to which the outcome of a team’s work is shared inside and outside the team, and transfers to organizational learning) were significantly different for African-Americans and Caucasians. The difference in means was 6.15 points. At a 95 percent confidence level, the average African-American score falls between .5111 and 11.7857 points higher than those of Caucasians.

The average scores of Asians were higher than the average scores for Caucasians on team learning conditions. These scores suggest Asians, more so than Caucasians, believe the learning which occurs is conducive to generating outcomes. For organizational learning contributions, the average scores of African-Americans were higher than the average scores for Caucasians. These results suggest African-Americans, more so than Caucasians, believe the learning in teams is shared inside and outside the team. At a .05 level of significance, the

Tukey test revealed no differences in ethnicity against organizational learning conditions and team learning outcomes.

**Research Question 4: Is there a relationship among team learning processes, team learning conditions, organizational learning contributions, and nursing longevity, salary and age?**

This research question was divided into nine null hypotheses, each of which represented nursing longevity, salary, and age with respect to team learning processes, team learning conditions, and organizational learning contributions. Interestingly, team learning processes, team learning conditions, and organizational learning contributions were the team learning variables which best predicted team learning outcomes in the regression model (Research Question 2). Each null hypothesis is described in the order as listed.

Ho 4.1: There is no relationship between team learning processes and nursing longevity.

Ho 4.2: There is no relationship between team learning processes and salary.

Ho 4.3: There is no relationship between team learning processes and age.

Ho 4.4: There is no relationship between team learning conditions and nursing longevity.

Ho 4.5: There is no relationship between team learning conditions and salary.

Ho 4.6: There is no relationship between team learning conditions and age.

Ho 4.7: There is no relationship between organizational learning contributions and nursing longevity.

Ho 4.8: There is no relationship between organizational learning contributions and salary.

Ho 4.9: There is no relationship between organizational learning contributions and age.

### ***Overview of Spearman Correlation: Nursing Longevity, Salary, Age, Team Learning Processes, Team Learning Conditions, and Organizational Learning Contributions***

To answer this research question, the following process was followed. First, descriptive statistics were used to provide information about nursing longevity, salary and age. Then, univariate statistics were run to analyze team learning processes, team learning conditions, and organizational learning contributions. Scatter plots were conducted to observe the presence of possible linear relationships. Next, the results of statistical analyses using Spearman correlation coefficient were computed to explore whether relationships exist among team learning processes, team learning conditions, organizational learning contributions, nursing longevity, salary, and age.

Spearman correlation coefficient was used since it is designed to measure linear association between the ranks of numeric variables which may not form normal distributions (Hatcher and Stepanski, 1994). It tests whether two variables are related to one another. The test does not indicate a cause and effect relationship. However, it does determine whether the variables move in the same or opposite directions. Positively correlated variables move in the same direction while negatively correlated variables move in the opposite direction. Correlations are between -1 and 1. The closer the correlation coefficient is to -1 or 1, the stronger the correlation (Sims, 2000). Level of significance was established at .05.

#### ***Nursing Longevity***

Nursing longevity was reported as a continuous variable. Nursing longevity, the years of working as a nurse, were reported on 169 nurses or 95.48 percent of the sample. Missing data accounted for 8 nurses or 4.52 percent of the sample (see Figure 11). The missing data were a result of nurses failing to answer the item regarding nursing longevity. The descriptive analysis indicated that the number of years employed as a nurse ranged from as little as 3

months to as much as 36 years. The mean number of years spent as a nurse was 12.02 years and the median of 10 years was in close proximity. The average deviation from the mean was 9.89 years which was a moderate spread of years working as a nurse. The most frequently reported number of years respondents worked as a nurse was 3 years. The graph in Figure 11 depicts the overall distribution of this variable. The graph is skewed to the right supporting that there were more nurses with fewer years experience than nurses who had been in the nursing field for a longer period of time. The data tends to cluster between 3 months and 10 years with 53.11 percent of the nurses with 10 years or less experience.



### *Annual Salary*

Nursing salary, a continuous variable, was reported in a categorical fashion. The reason for doing this is because the nurses were more likely to respond to data when the data is presented in a categorical fashion rather than if they had to list individual salary. Data were reported on 161 nurses or 90.96 percent of the sample. Missing data accounted for 16 nurses or 9.04 percent of the sample. Missing data were the result of nurses failing to answer the item regarding nursing longevity. In general, nurses at ABC Hospital earn between \$35,000 and \$49,999, representing 52.18 percent of the sample (see Table 28). Those earning less than \$35,000 accounted for 11.80 percent of the sample. The respondents earning between \$50,000 and \$59,999 represented 19.26 percent of the sample. As nursing salary increases, the number of nurses earning higher salaries decreases. In fact, only 3 nurses or 1.86 percent of respondents earn \$75,000 and above. Among nurses, these individuals might be nurse managers, assume additional responsibilities for more pay, or be the more senior nurses.

Table 28  
Frequency Distribution of Respondents by Salary

Annual Salary	Frequency	Percent
\$25,000 - \$29,999	4	2.48
\$30,000 - \$34,999	15	9.32
\$35,000 - \$39,999	34	21.12
\$40,000 - \$44,999	27	16.77
\$45,000 - \$49,999	23	14.29
\$50,000 - \$54,999	17	10.56
\$55,000 - \$59,999	14	8.70
\$60,000 - \$64,999	14	8.70
\$65,000 - \$69,999	5	3.11
\$70,000 - \$74,999	5	3.11
\$75,000 and above	3	1.86

Missing data = 16

***Age***

Age, a continuous variable, was reported in a categorical fashion. Age was grouped because it was made known to the researcher that nurses tend to better report age when they can select from age groups. Respondents were able to choose from 8 age ranges: 1) 20-24 years; 2) 25-29 years; 3) 30-34 years; 4) 35-39 years; 5) 40-44 years; 6) 45-49 years; 7) 50-54 years; and, 8) 55 years and above. Data were reported on 168 nurses or 94.92 percent of the sample. Missing data accounted for 9 nurses or 5.08 percent. Data shows a relatively uniform distribution among the age groups with the exception of a slight drop among older

respondents and a slight peak among nurses who are 25-29 years old (see Figure 12).

Overall, the graph shows that one can expect the majority of nurses to be between 20 and 49 years old, with a fairly even percentage representing each of the age groups. As age increases, the number of nurses decreases.

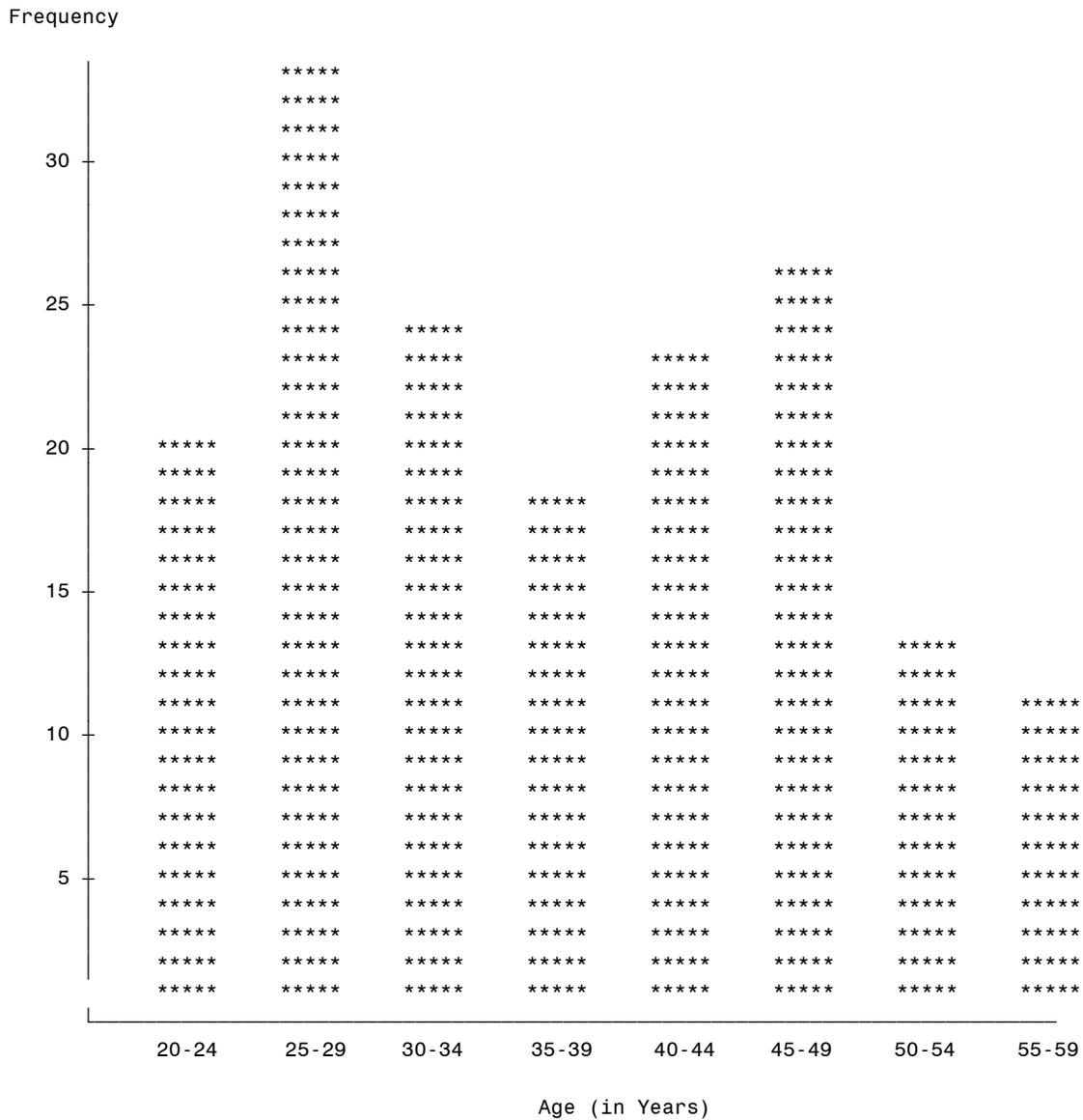


Figure 12. Bar graph of age of nurses with respect to frequency and age levels.

### ***Overview of Team Learning Processes, Team Learning Conditions, and Organizational Learning Contributions***

Team learning processes measure the extent to which team members modify their thoughts and behaviors based on information learned from other team members. Team learning conditions measure a team's ability to learn, and to generate learning outcomes. The team learning conditions variable is divided into three categories: 1) Appreciation of Teamwork, 2) Individual Expression, and 3) Operating Principles.

The appreciation of teamwork variable measures the extent to which nurses hear, consider, and appreciate other nurses' ideas and viewpoints. The individual expression category measures the extent to which individual members have the opportunity to contribute to the team's mission and influence the team's progression. The operating principles category reflects the extent to which the team effectively and efficiently operates. The organizational learning contributions measure the extent to which the outcome of a team's work is shared inside and outside the team, and transfers to organizational learning.

All three team learning variables (team learning processes, team learning conditions, and organizational learning contributions) were considered continuous variables measured on an ordinal scale. Both the salary and age variables were grouped and therefore considered categorical variables. Therefore, Spearman correlation coefficients were used to analyze the data. Spearman correlation coefficient was used since it is designed to measure linear association between the ranks of numeric variables which may not form normal distributions (Hatcher and Stepanski, 1994). It tests whether two variables are related to one another. The test does not indicate a cause and effect relationship. However, it does determine whether the variables move in the same or opposite directions. Positively correlated variables move in the same direction while negatively correlated variables move in the opposite direction.

Correlations are between -1 and 1. The closer the correlation coefficient is to -1 or 1, the stronger the correlation (Sims, 2000).

### ***Team Learning Processes***

Data reported on team learning processes were from a sample of 177. Team learning processes measure the extent to which team members modify their thoughts and behaviors based on information learned from other team members. There were no missing data for the team learning processes item. The mean score was 82.81, indicating a score within the synergistic mode (81-112) of team learning processes (see Table 5). The synergistic category indicates the nursing team jointly constructs shared meanings, assumptions, and language which lead to consensually developed solutions, positions, and recommendations.

The scores deviated from the norm by 14.31 points which is a rather large spread, especially in comparison to the other variables. The other measures of central tendency, the median of 84 and the mode of 83 were in close proximity to the mean score of 82.81. In fact, the three measures of central tendency fall within the synergistic mode of team learning processes. A stem and leaf graph indicates data were slightly skewed to the right toward the higher scores. However, data were basically mound-shaped, almost forming a normal distribution. A cluster of scores appeared between 76 and 99, with 69 percent of the scores falling within the cluster. Scores ranged from 35 to 110. The modal interval fell between 95 and 99 with 18 percent of the scores falling within the modal interval (see Figure 13). These scores and the graphical representation indicate the majority of the nurses value the learning which occurs in teams. The learning leads to collaborative work efforts and consensus when developing solutions and recommendations.



deviated from the mean by 8.13 points. Half the nurses scored 44 or more and half the nurses scored 44 or less on appreciation of teamwork. The most frequently reported score was 46. Data were heavily skewed to the right toward the higher end of scores. The box plot illustrates there was much more variation in the lower end of scores than there were at the higher end which is consistent with the distribution of scores. In fact, the lower 25 percent of the graph had the most variation. As compared to the first quartile, there was decreased variation in the second quartile. The variation in the third quartile decreased slightly and the variation in the fourth quartile increased (see Figure 14). Thus, mean scores for appreciation of teamwork were relatively close to the median and the mode, indicating nurses are open to hearing and considering others' ideas and viewpoints.

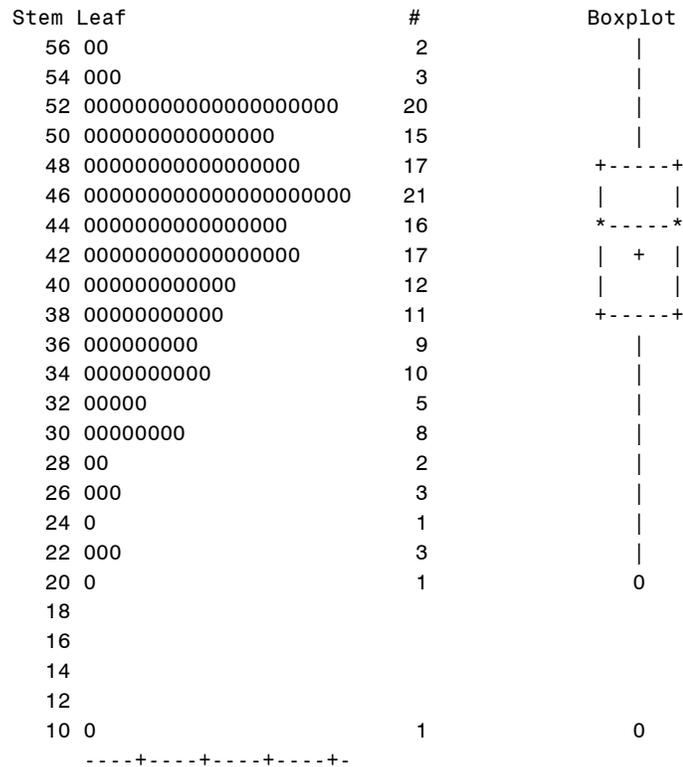


Figure 14. Stem and Leaf and Box Plots for Appreciation of Teamwork.

*Individual Expression.* The individual expression variable measures the extent to which individual members have the opportunity to contribute to the team’s mission and influence the team’s progression. The mean score for individual expression was 10.53 which fell on the borderline of unfavorable (3-10) and neutral (11-14) scores. Unfavorable category scores indicate comments and contributions are not taken seriously, and the direction the group pursues is not based on team consensus. On average, scores deviated from the norm by 4.64 points, showing a small deviation in responses. The median score was 10 and the modal interval was 7, with 13.56 percent of scores falling within the interval. Data were heavily skewed to the left, toward the lower scores. The skewing indicates there is a limited extent to which nurses are comfortable expressing their objections. And, they perceive themselves as having limited input in forming missions and goals which influence the team’s operation on an on-going basis (see Figure 15).

Stem	Leaf	#
21	000	3
20	0	1
19	000000000	9
18	0000	4
17	0000000000	10
16	00000000	8
15	000000000	9
14	0	1
13	00000000	8
12	0000000000	11
11	000000000000000000	18
10	000000000	9
9	000000000000	12
8	000000000000	13
7	0000000000000000000000	24
6	0000000000000000	16
5	0000000000	11
4	00000	5
3	00000	5

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Figure 15. Stem and Leaf Plot for Individual Expression.

*Operating Principles.* Operating principles measure the extent to which the team effectively and efficiently operates. The mean score for operating principles was 24.37, indicating a score within the favorable range (20-35). Teams with scores within the favorable range are able to balance task accomplishment with relationship building. They are also able to collectively establish commonly held beliefs, values, purpose and structure. On average, scores deviated from the mean by 5.46 points which is a small to moderate deviation. The median of 25 is close to the mean (24.37) and also falls within the favorable range. A cluster of scores appeared between 20 and 32 with 77.40 percent of the scores falling within the cluster. The mode of 24 fell within the cluster of scores, and is also within the favorable range. Data were skewed to the right, toward the higher scores but the distribution was near normally distributed (see Figure 16). Scores falling within the favorable range indicate the nurses at ABC Hospital collectively establish commonly held beliefs, values, purpose and structure.

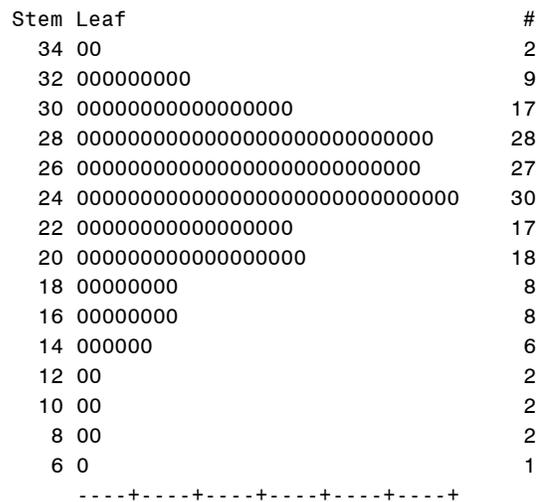


Figure 16. Stem and Leaf Plot for Operating Principles.

**Organizational Learning Contributions**

Data for organizational learning contributions were analyzed from a sample of 177. There were no missing data for the organizational learning contributions item. Organizational learning contributions measure the extent to which the outcome of a team’s work is shared inside and outside the team, and transfers to organizational learning. The mean score was 38.16, falling within the neutral range (32-39) of scores. Scores within the neutral range indicate a somewhat limited degree of passing information from the teams to the organization. On average, scores deviated from the mean by 7.35 points which indicates a moderate spread of scores. A cluster of scores appeared between 28 and 46 with 86.44 percent falling within that range. The median of 39 fell within the cluster. The most frequently reported score was 44, with 13 percent of nurses reporting that score. The box plot shows slightly increased variation in scores within both the lower and top quartiles. The middle two quartiles appear similar in variation (see Figure 17).

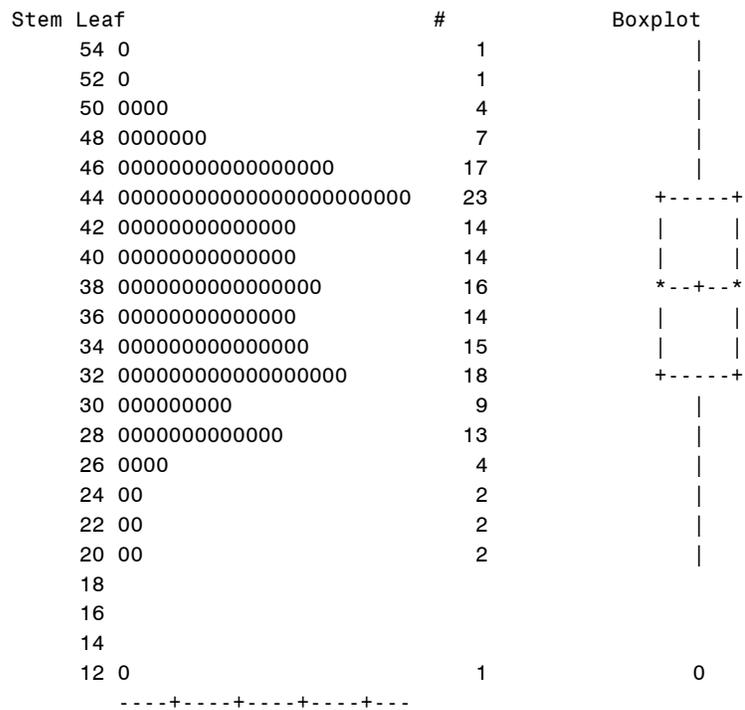


Figure 17. Stem and Leaf and Box Plots for Organizational Learning Contributions.

### ***Spearman Correlation***

Team learning processes, team learning conditions and organizational learning contributions were correlated with nursing longevity, salary and age. Scatter plots were used to determine if there was a linear relationship between team learning processes, team learning conditions, organizational learning contributions, and nursing longevity, salary and age. The scatter plots did not indicate linear relationships between team learning processes, team learning conditions, organizational learning contributions and nursing longevity, salary and age. Spearman correlation coefficient was used to further examine the results of the scatter plots.

Spearman correlation coefficient is designed to measure linear association between the ranks of numeric variables which may not form normal distributions (Hatcher and Stepanski, 1994). The salary and age variables were grouped ordinally, and may not form normal distributions. The Spearman correlation coefficient supported the initial indication of the scatter plots (see Table 29). As shown in Table 29, all the tests showed insignificant results ( $p > .05$ ).

Table 29  
Spearman Correlation for Team Learning Processes, Team Learning Conditions, Organizational Learning Contributions and Nursing Longevity, Salary, and Age

Variable	Nursing Longevity	Annual Salary	Age
Team Learning Processes	r = 0.00487 p = 0.9499	r = 0.04021 p = 0.6126	r = -0.02520 p = 0.7458
Team Learning Conditions	r = -0.06798 p = 0.3798	r = -0.05170 p = 0.5148	r = -0.06723 p = 0.3865
Organizational Learning Contributions	r = 0.07485 p = 0.3335	r = 0.06015 p = 0.4485	r = -0.02041 p = 0.7929

p = probability value  
r = correlation coefficient

This analysis was conducted to answer the research question, “Is there a relationship among team learning processes, team learning conditions, organizational learning contributions, and nursing longevity, salary and age?” To determine the relationship, Spearman Correlation coefficient was used. Spearman correlation coefficient was used since it is designed to measure linear association between the ranks of numeric variables which may not form normal distributions (Hatcher and Stepanski, 1994). It tests whether two variables are related to one another. The test does not indicate a cause and effect relationship. However, it does determine whether the variables move in the same or opposite directions. Positively correlated variables move in the same direction while negatively correlated variables move in the opposite direction. Correlations are between -1 and 1. The closer the correlation coefficient is to -1 or 1, the stronger the correlation (Sims, 2000).

The Spearman correlation revealed no linear association among team learning processes, team learning conditions, organizational learning contributions and nursing longevity, salary and age. Thus, it is appropriate to fail to reject each of the nine null hypotheses. At a .05 level of significance, nursing longevity, salary, and age have no relationship with team learning processes, team learning conditions, and organizational learning contributions. Each of the p-values exceeded the .05 level of significance and the correlation coefficients are neither close to 1 or -1 (Table 29).

**Research question 5: Is there a relationship among organizational learning conditions and team learning outcomes, and nursing longevity, salary and age?**

This research question was divided into six null hypotheses, each of which represented nursing longevity, salary, and age with respect to organizational learning conditions and team learning outcomes. Each null hypothesis is described in the order as listed.

Ho 5.1: There is no relationship between organizational learning conditions and nursing longevity.

Ho 5.2: There is no relationship between organizational learning conditions and salary.

Ho 5.3: There is no relationship between organizational learning conditions and age.

Ho 5.4: There is no relationship between team learning outcomes and nursing longevity.

Ho 5.5: There is no relationship between team learning outcomes and salary.

Ho 5.6: There is no relationship between team learning outcomes and age.

***Overview of Spearman Correlation: Nursing Longevity, Salary, Age, Organizational Learning Conditions, and Team Learning Outcomes***

To answer this research question, the following process was followed. First, descriptive statistics were used to provide information about nursing longevity, salary, and age. Next, univariate statistics were run to analyze organizational learning conditions and team learning

outcomes. Then, the results of statistical analyses using Spearman correlation coefficient were utilized to explore whether relationships exist among organizational learning conditions, team learning outcomes, nursing longevity, salary, and age.

Spearman correlation coefficient is designed to measure linear association between the ranks of numeric variables which may not form normal distributions (Hatcher and Stepanski, 1994). It tests whether two variables are related to one another. The test does not indicate a cause and effect relationship. However, it does determine whether the variables move in the same or opposite directions. Positively correlated variables move in the same direction while negatively correlated variables move in the opposite direction. Correlations are between -1 and 1. The closer the correlation coefficient is to -1 or 1, the stronger the correlation (Sims, 2000). Level of significance was established at .05.

### ***Nursing Longevity***

Nursing longevity was reported as a continuous variable. Nursing longevity, the years of working as a nurse, were reported on 169 nurses or 95.48 percent of the sample. Missing data accounted for 8 nurses or 4.52 percent of the sample. The missing data were a result of nurses failing to answer the item regarding nursing longevity. The descriptive analysis indicated that the number of years employed as a nurse ranged from as little as 3 months to as much as 36 years. The mean number of years spent as a nurse was 12.02 years. The average deviation from the mean was 9.89 years which was a moderate spread of years working as a nurse. The median of 10 is in close proximity to the mean. The most frequently reported number of years respondents worked as a nurse was 3 years.

The graph shown in Figure 18 shows a distribution skewed to the right. This suggests that the sample contains nurses who are more likely to be less experienced than more experienced. In fact, a cluster from 3 months to 10 years makes up 55.62 percent of the nursing sample. Only 14.80 percent of the sample consists of nurses with 25 to 36 years of nursing experience.



### ***Annual Salary***

Nursing salary, a continuous variable, was reported in a categorical fashion. The reason for doing this was because it became known to the researcher that nurses tend not to indicate salary and age on survey questionnaires. Therefore, annual salary was presented in a categorical fashion to lessen the possibility of nurses failing to answer the item. Data were reported on 161 nurses or 90.96 percent of the sample. Missing data accounted for 16 nurses or 9.04 percent of the sample. Missing data were the result of nurses failing to answer the item regarding nursing longevity. In general, nurses at ABC Hospital earn between \$35,000 and \$49,999, representing 52.18 percent of the sample (see Table 30). Nineteen nurses, 11.8 percent of the sample earned less than \$35,000. Thirty-one nurses earned between \$50,000 and \$59,999, accounting for 19.26 percent of the sample. As nursing salary increases, the number of nurses earning higher salaries decreases. In fact, only 3 nurses or 1.86 percent of respondents earn \$75,000 and above. Among nurses, these individuals might be nurse managers, assume additional responsibilities for more pay, or be the more senior nurses.

Table 30  
Frequency Distribution of Respondents by Nursing Salary

Annual Salary	Frequency	Percent
\$25,000 - \$29,999	4	2.48
\$30,000 - \$34,999	15	9.32
\$35,000 - \$39,999	34	21.12
\$40,000 - \$44,999	27	16.77
\$45,000 - \$49,999	23	14.29
\$50,000 - \$54,999	17	10.56
\$55,000 - \$59,999	14	8.70
\$60,000 - \$64,999	14	8.70
\$65,000 - \$69,999	5	3.11
\$70,000 - \$74,999	5	3.11
\$75,000 and above	3	1.86
Total	161	

Missing data = 16

### *Age*

Age, a continuous variable, was reported in a categorical fashion. Age was grouped because it was made known to the researcher that nurses tend to better report age when they can select from age groups. Respondents were able to choose from 8 age ranges: 1) 20-24 years; 2) 25-29 years; 3) 30-34 years; 4) 35-39 years; 5) 40-44 years; 6) 45-49 years; 7) 50-54 years; and, 8) 55 years and above. Data were reported on 168 nurses or 94.92 percent of

the sample. Missing data accounted for 9 nurses or 5.08 percent (see Figure 19). Data shows a relatively uniform distribution among the age groups with the exception of a slight drop among older respondents. Overall, the graph shows that you can expect the nurses to be between 20 years old and above 55 years old with a fairly even percentage representing each age group.

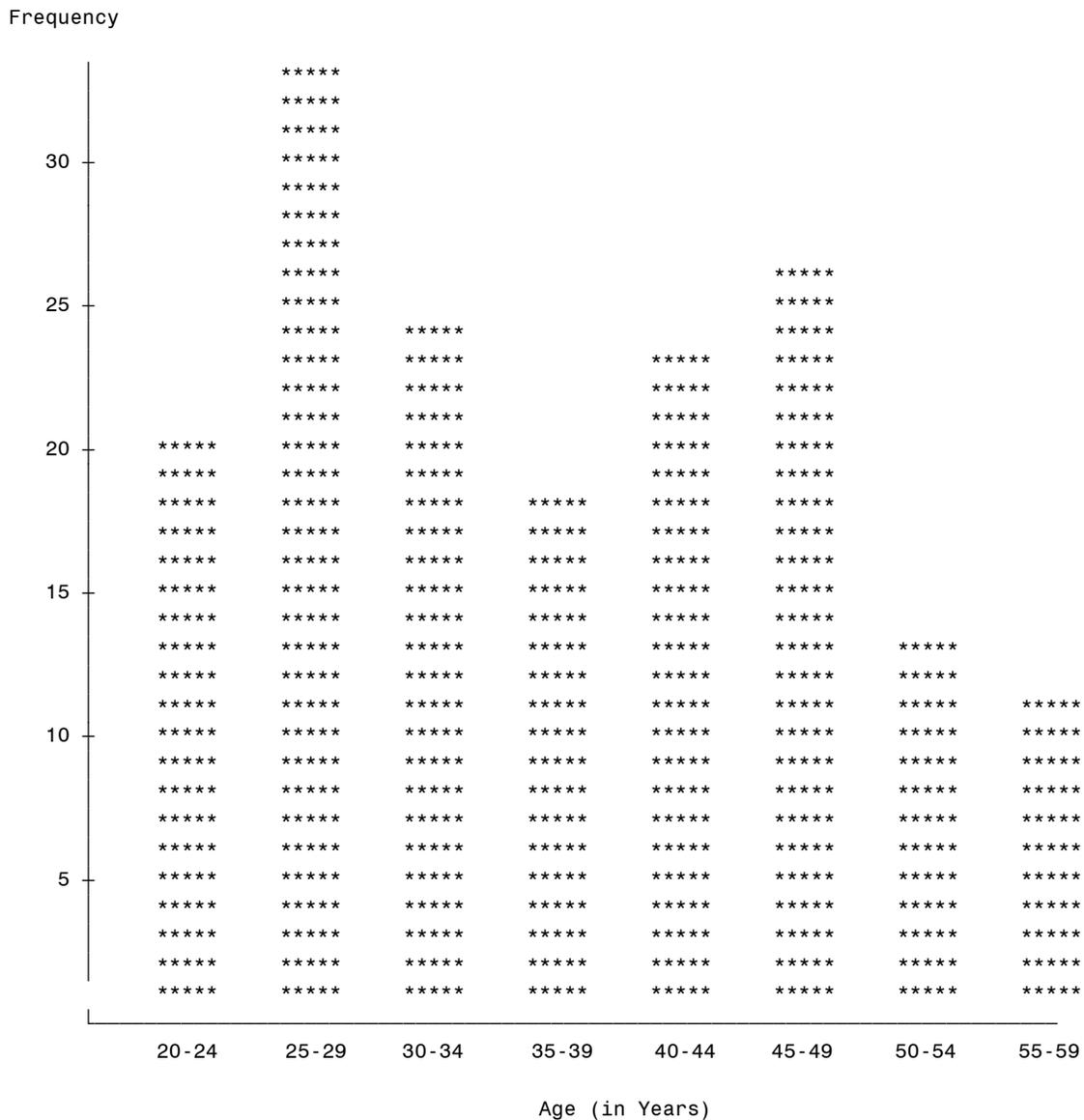


Figure 19. Bar Graph for Age Ranges of Nurses with respect to the frequency, denoting the number of nurses representing each age group.

### ***Organizational Learning Conditions***

Organizational learning conditions measure the extent to which the outcome of a team's work is accepted by the organization. The organizational learning conditions variable is subcategorized into two categories: 1) support for operation of teams and 2) support for collaboration within the organization. Data reported on organizational learning conditions were from a sample of 177. There were no missing data for the variable.

*Support for Operation of Teams.* The support for operation of teams variable measures the degree to which managers are supportive and tolerant of teamwork. The mean score for support for operation of teams was 33.12, indicating a score within the neutral range (27-34). Neutral range scores indicate the conditions that impede learning are generally absent. However, neutral range scores also indicate that learning could be more progressive if support for teams improved. As evidenced by the organizational learning contributions variable, although the mean fell in the neutral range, the median of 34 fell at the upper limit of the neutral category. The mode of 35 fell in the favorable category. This suggests overall neutrality although leaning more toward the favorable than the unfavorable category. These scores indicate managers could be more open to the team output even if the output challenges existing norms or practices. Data were skewed to the right indicating a trend toward higher scores (see Figure 20).

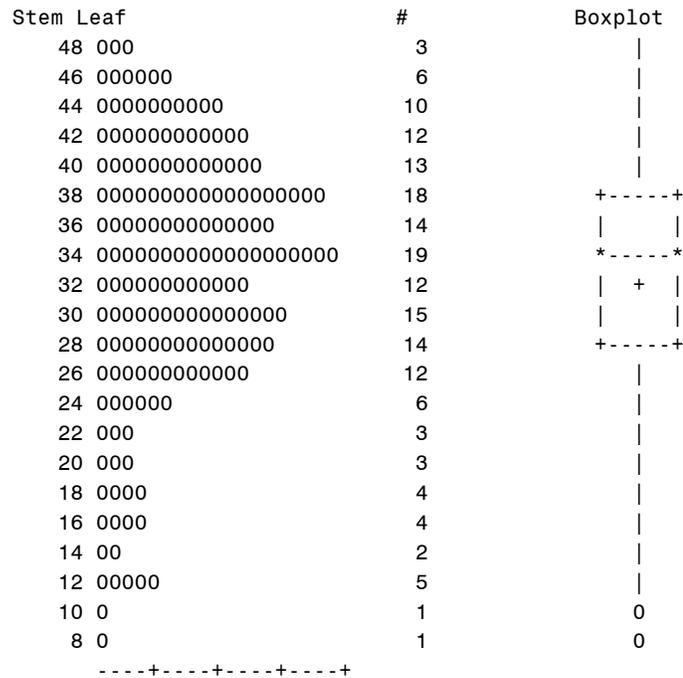


Figure 20. Stem and Leaf and Box Plots for Support for Operation of Teams.

*Support for Collaboration.* The mean score for support for collaboration within organization was 24.60, indicating a higher score within the neutral range (18-25). Neutral scores suggest the conditions to learn are not impeded but learning could be taking place more rapidly and at deeper levels if the organization better embraced collaborative work efforts. The median score for this variable, 24, also fell within the neutral area, providing further evidence that nurses at ABC Hospital could be learning more if the hospital more openly endorsed learning among nurses. The support for collaboration within the organization variable measures the extent to which the organization values and rewards sharing throughout the entire organization. On average, scores deviated from the norm by 4.49 points. A cluster of scores appeared between 20 and 29 with 74.58 percent of the scores falling within the cluster. Scores ranged from 14 to 38 with the most frequently reported



### ***Team Learning Outcomes***

Data for team learning outcomes were collected from the entire sample of 177. The mean score was 35.92, indicating a score within the favorable range (32 to 49). The favorable range indicates nurses have achieved a high degree of collective learning as a result of their working together. The measures of central tendency all fell within the favorable range, as the median was 37 and the mode was 39. Data were skewed slightly to the right, indicating the majority of nurses scored team learning outcomes high.

### ***Spearman Correlation***

Scatter plots were used to determine if there was a relationship between organizational learning conditions, team learning outcomes, and nursing longevity, salary and age. Each scatter plot did not indicate any relationship between organizational learning conditions, team learning outcomes, and nursing longevity, salary and age. The Spearman correlation coefficient supported the initial indication of the scatter plots. The results indicate that none of the tests showed a relationship at the .05 level of significance (see Table 31).

Table 31  
Spearman Correlation for Organizational Learning Conditions, Team Learning Outcomes and Nursing Longevity, Salary, and Age

Variable	Nursing Longevity	Annual Salary	Age
Organizational Learning Conditions	r = 0.02165 p = 0.7800	r = -0.00844 p = 0.9154	r = -0.02183 p = 0.7789
Team Learning Outcomes	r = 0.00926 p = 0.9049	r = 0.05421 p = 0.4946	r = -0.02508 p = 0.7469

r = correlation coefficient  
p = probability value

This analysis was conducted to answer the research question, “Is there a relationship among organizational learning conditions and team learning outcomes, and nursing longevity, salary and age?” At the .05 level of significance, the results of the Spearman correlation revealed no linear association among organizational learning conditions, team learning outcomes and nursing longevity, salary and age.

Spearman correlation coefficient is designed to measure linear association between the ranks of numeric variables which may not form normal distributions (Hatcher and Stepanski, 1994). It tests whether two variables are related to one another. The test does not indicate a cause and effect relationship. However, it does determine whether the variables move in the same or opposite directions. Positively correlated variables move in the same direction while negatively correlated variables move in the opposite direction. Correlations are between -1 and 1. The closer the correlation coefficient is to -1 or 1, the stronger the correlation (Sims, 2000). Therefore, it is appropriate to fail to reject each of the six null hypotheses. Each of the p-values exceeded the .05 level of significance and the correlation coefficients are neither close to 1 or -1 (see Table 31).

### ***Summary***

The Chapter Four research findings are as follows:

- The majority of the sample consisted of Caucasian females who are full-time employees at ABC Hospital. The majority of the respondents have Bachelor of Science Degrees and have been nurses for an average of 12 years.
- Team learning processes, team learning conditions and organizational learning contributions are the predictors of team learning outcomes.

- Of the three predictors, team learning processes alone explain 70 percent of the 73 percent sample variation. The other two variables in combination are only able to add an additional 3 percent to a model that already contains team learning processes.
- The team learning variables are highly significant with one another, suggesting they are offering similar information.
- No significant differences were found for any of the predictors of team learning outcomes (team learning processes, team learning conditions, and organizational learning contributions) based on age, degree, employment status (part-time or full-time), or salary.
- There is an indication that Asians, more so than Caucasians, may believe the learning which occurs in teams is conducive to generating outcomes. There is also an indication that African-Americans, more so than Caucasians, may believe the learning in teams is shared inside and outside the team.
- No relationships were found among team learning processes, team learning conditions and organizational learning contributions, and nursing longevity, salary, and age.
- No relationships were found among organizational learning conditions, team learning outcomes, nursing longevity, salary, and age

Chapter Four presented the findings of this research. Chapter Five explores the implications of the findings, and provides recommendations for further research.

## **Chapter Five**

### **Discussion and Implications**

The purpose of this study was twofold. First, this study took an exploratory approach into examining the interaction of the team learning variables. The team learning variables developed by Dechant, Marsick, & Kasl (1993) are team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions. It is important to study the interaction of the variables to provide further insight into whether the variables individually, or in combination, add to the empirical base of understanding team learning theory.

Secondly, this study took an already established work team and analyzed whether team learning theory is applicable to work and demographic variables (ethnicity, gender, salary, age, professional degree, work status, and nursing longevity). The team selected for analysis was nurses at ABC Hospital. This team was chosen because teamwork is fundamental to their work product, and they rely upon the knowledge of one another to provide care for patients. From the aforementioned twofold purpose, this study addressed the following research questions:

1. What are the gender, ethnic, professional degree, nursing longevity, salary, and age characteristics of nurses at ABC Hospital?
2. Do team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions have an impact on team learning outcomes among nurses at ABC Hospital?
3. Do team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions differ by

ethnicity, gender, degree, full- vs. part-time work status, age, and salary?

4. Is there a relationship among team learning processes, team learning conditions, organizational learning contributions, and nursing longevity, salary and age?

5. Is there a relationship among organizational learning conditions, team learning outcomes, and nursing longevity, salary and age?

The population for this study consisted of 1,090 nurses who work in teams at ABC Hospital. The sample was selected using a simple random sampling procedure. Data were gathered through the Team Learning Survey, an instrument developed by Dechant and Marsick (1993) from the research of Dechant and Marsick (1993), and Dechant, Marsick, and Kasl (1993). Respondents completed and returned the instrument's response sheet. Responses were computed for each of the five team learning variables (team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions) to determine the extent to which the nursing team was engaged in each team learning construct. SAS Institute version 8.2 was used to compute data.

### ***Summary of Results***

#### **Research Question One: What are the gender, ethnic, professional degree, nursing longevity, salary, and age characteristics of nurses at ABC Hospital?**

For research question one, descriptive statistics were analyzed to lend insight into the sample. It was discovered that the majority of nurses are Caucasian females who work full-time and most likely have Bachelor of Science degrees. The age of nurses varies but most are above the age of 20 and below the age of 55. Most nurses earn an annual salary between \$35,000 and \$39,999. On average, nurses have worked for ABC Hospital for 8 years, with

the number of years working for the hospital ranging from 3 months to 40 years. On average, nurses have been employed in the nursing field for 12 years with as little experience as 3 months and as much experience as 36 years.

**Research Question Two: Do team learning processes, team learning conditions, organizational learning contributions, and organizational learning conditions have an impact on team learning outcomes among nurses at ABC Hospital?**

For research question two, a multiple regression process (Hatcher & Stepanski, 1994) was used to examine the data. The independent variables were team learning processes, team learning conditions, organizational learning contributions and organizational learning conditions. The dependent variable was team learning outcomes. Three of the four independent variables (team learning processes, team learning conditions, and organizational learning contributions) were retained in a model to help predict team learning outcomes. The model containing these variables was able to explain 73 percent of the sample variation in team learning outcomes. However, it is noted that the team learning processes variable alone explains 70 percent of the 73 percent sample variation. During the multiple regression process it was also discovered that the team learning variables are highly significant with one another ( $p < .0001$ ).

**Research Question Three: Do team learning processes, team learning conditions, team learning outcomes, organizational learning conditions, and organizational learning contributions differ by ethnicity, gender, degree, full- vs. part-time work status, age, and salary?**

For research question three, analysis was conducted with respect to the team learning variables, and work and demographic variables. To determine whether differences exist in

the average scores, the team learning variables were analyzed against ethnicity, gender, degree, employment status, age and salary. Ethnicity was the only variable that showed differences in mean scores. Asians scored higher than Caucasians on team learning conditions (the extent to which a team is able to learn and generate learning outcomes). African-Americans scored higher than Caucasians on organizational learning contributions (the extent to which the outcome of a team's work is shared inside and outside the team, and transfers to organizational learning).

**Research Question Four: Is there a relationship among team learning processes, team learning conditions, organizational learning contributions, and nursing longevity, salary and age?**

For research question four, the results of Spearman correlation (Hatcher & Stepanski, 1994) indicated there is no relationship at a .05 level of significance among team learning processes, team learning conditions, organizational learning contributions, and nursing longevity, salary and age.

**Research Question Five: Is there a relationship among organizational learning conditions, team learning outcomes, and nursing longevity, salary and age?**

For research question five, the results of Spearman correlation (Hatcher & Stepanski, 1994) indicated there is no relationship at a .05 level of significance among organizational learning conditions and team learning outcomes, and nursing longevity, salary and age.

In conclusion, this study indicated that team learning outcomes (extent to which a team functions and learns collectively) are predicted primarily by team learning processes (the extent to which members modify their thoughts and behaviors based on information learned from other team members). The interaction of two additional variables provided more depth

to understanding team learning outcomes. Those two variables were team learning conditions (ability of a team to learn and generate learning outcomes) and organizational learning contributions (outcome of a team's work that is shared inside and outside the team and transfers to organizational learning). Analysis of the ethnic characteristic gave more insight. African-Americans and Asians, on average had higher scores than Caucasians for organizational learning contributions and team learning conditions, respectively.

### ***Conceptual Framework***

The interpretation and application of the results of this study are predicated on three distinct paradigms – organizational learning, the learning organization and team learning. Each paradigm has its distinct theoretical foundation. However, team learning manages to weave all three theories into a systems paradigm. Such a paradigm focuses on the dynamic relationship of all three theories, and the concept of working and learning together for the mutual benefit of the individual, the team of which the individual is a member, and the organization of which the team is a part.

In analyzing the relationships of organizational learning, team learning, and the learning organization, the literature included academic writings and scholarly research on individual, team, and organizational learning (Watkins and Marsick, 1993). However, the literature failed to explore the relationship of the team learning variables developed by Dechant, Marsick, and Kasl (1993). This study was unique in that it provided understanding about the interaction of the team learning variables. Conclusions and interpretations regarding the findings follow.

### ***Conclusion and Interpretation One***

On the basis of this study alone, it is difficult to unequivocally conclude that the

combined interaction of the team learning variables provide more insight into the extent a team is collectively engaged in learning. The findings of this study indicate the team learning processes variable is a strong predictor of team learning outcomes. Yet, the team learning conditions and organizational learning contributions variables were also predictors of team learning outcomes. However, those variables (team learning conditions and organizational learning contributions) in combination only added a relatively small amount of influence to team learning processes when predicting team learning outcomes.

These findings are supported in organizational learning literature. The team learning processes variable measures the extent to which members modify their individual beliefs, assumptions, opinions, and knowledge based on what they learn from other team members (Marsick and Dechant, 1993). Research advises that although organizational learning assumes focus on the organization, individuals comprise the organization (Argyris & Schön, 1978). Therefore, individual learning is a conduit for organizational learning. Inasmuch as individuals learn, adapt, and update their knowledge and competencies, their learning is mutually beneficial to the organization (Nayak et al., 1995). “Just as individuals are the agents of organizational action, so they are the agents for organizational learning” (Argyris & Schön, 1978, p. 19).

### ***Conclusion and Interpretation Two***

A team can function in a synergistic mode but not be effective in all three areas of team learning conditions (appreciation of teamwork, individual expression and operating principles) (Dechant & Marsick, 1993). The literature discusses a team’s nonlinear change which occurs back and forth through three modes - fragmented, pooled, and synergistic (Kasl, Marsick, & Dechant, 1997). In the fragmented mode, individual team members may

learn but do not necessarily share or exchange their insights. Since they fail to share, they could be relying on misguided or incorrect knowledge. In the pooled mode, individuals share personal perspectives with others. However, there is no sharing of information with all team members. As such, the team fails to reconcile opposite viewpoints into a unified perspective. In the synergistic mode, the team jointly constructs shared meanings, assumptions, and language which lead to consensually developed solutions, positions, and recommendations (Kasl, Marsick, & Dechant, 1997).

For the team learning processes variable, the findings of the present study indicate the nursing team at ABC Hospital functions in the synergistic mode. The team score of 82.58 barely meets the minimum score within the range of 81 to 112 for the synergistic mode. Nevertheless, the team does fall in the range and therefore is characterized as learning and working well together.

The team learning conditions variable measures the extent to which the conditions of an organization permit a team to learn and generate learning outcomes. The variable is composed of three subcategories: 1) Appreciation of Teamwork, 2) Individual Expression, and 3) Operating Principles. Appreciation of teamwork represents the need to be open to hearing and considering each other's ideas. Individual expression represents the ability of everyone to offer input within the team and organization. Operating principles reflect how well a team collectively established commonly held beliefs, values, purpose and structure (Dechant and Marsick, 1993).

The appreciation of teamwork, individual expression, and operating principles variables are evaluated by three rankings: favorable, unfavorable and neutral. The nursing team at ABC Hospital scored within the favorable range for appreciation of teamwork and operating

principles. Favorable scores for appreciation of teamwork indicate nurses are open to learning from, considering and appreciating differing views from both inside and outside the team. Favorable scores for operating principles indicate the nursing team at ABC Hospital is able to balance task accomplishment with relationship building. They are also able to collectively establish commonly held beliefs, values, purpose and structure.

The literature provides insight into these findings. Argyris and Schön (1978) differentiate between two types of learning – single-loop and double-loop. Single-loop learning occurs “when members of the organization respond to changes in the internal and external environments of the organization by detecting errors which they then correct so as to maintain the central features of organizational theory-in-use” (p. 18). Members function from operating within the rules and policies of an organization. They progress from error detection to error correction (Argyris & Schön, 1978). Single-loop learning is effective when errors are detected and changed within the framework of the organization’s normative infrastructure. However, it is important to note that Argyris and Schön (1978) acknowledge that, on occasion, a change in the organizational norms may be necessary. Sometimes error correction means modifying the existing practices and policies.

Argyris (1991) describes double-loop learning as the ability to critically reflect upon personal behaviors, and acknowledge and identify ways those behaviors contribute to the organization’s problems; then, modify the behaviors. Harshman and Phillips (1994) report organizational learning involves an organization’s capacity to modify the way it functions based on experience. The definition rests heavily on individuals’ learning, and “trial and error” experiences to foster change in an organization. However, the nursing team scored within the unfavorable range for individual expression. Important to note is the fact that the

unfavorable scores were close to the borderline of the unfavorable/neutral range. Scores within the unfavorable range indicate nurses' comments and contributions are perceived as not being taken seriously, and the direction the group pursues is not based on team consensus. These scores suggest nurses could benefit from having more opportunities to openly offer comments regarding the direction they desire to pursue as a team. In fact, the scores for organizational learning contributions and organizational learning conditions suggest similar information. The scores suggest nurses perceive their issues, ideas, suggestions, and/or concerns could be more readily accepted and implemented by the nursing administration.

### ***Conclusion and Interpretation Three***

The team learning scores indicate learning is occurring within the nursing team at ABC Hospital. Interestingly, the scores also indicate that team learning can occur even when the team perceives its learning is not being accepted by the organization. The score for organizational learning contributions was 38.16 which falls within the neutral range of 32 to 39. Scores within the neutral range indicate a somewhat limited degree of passing information from the teams to the organization. The score for organizational learning conditions (support for operation of teams) was 33.12 which falls within the neutral range of 27 to 34. Neutral range scores indicate the conditions that impede learning are generally absent. However, neutral range scores also indicate that learning could be more progressive if support for teams improved. The score for organizational learning conditions (support for collaboration) was 24.60. The score fell within the neutral range of 18 to 25. Neutral scores suggest the conditions to learn are not impeded but learning could be taking place more rapidly and at deeper levels if the organization better embraced collaborative work efforts. It

is noted that all the neutral scores were toward the high end of their ranges. Therefore, these scores indicate learning is occurring within the nursing team. However, the scores also indicate nurses perceive their learning as not being accepted by management.

The literature provides insight into understanding the neutral range scores within teams and the organization. Shelton (1999) believes “teams can become the vehicle that drives organizations toward truly becoming learning organizations” (p. 2). Senge (1990) states that by imagining possibilities and breaking through traditional boundaries, team learning can lead to prosperous results for both teams and the organization for which they are a part (Senge, 1990). Senge (1990) along with Karash (as cited in Sugarman, 1997) implies the abandonment of the traditional leader-follower syndrome which presently exists in organizations. Kasl, Marsick, and Dechant (1997) support the abandonment of hierarchy, and like Karash (as cited in Sugarman, 1997), suggest a more flattened organization where the work and vision of employees are shared with that of the organization. The flattened organizational structure highlights communicating knowledge and information for the purpose of producing results.

#### ***Conclusion and Interpretation Four***

Cultural differences may account for differing perspectives about team learning. It is interesting to note that the specific work and demographic variables appeared to have no significant impact on team learning. However, it is also interesting to note that team learning scores differed by ethnicity. In general, minority ethnicities perceived team learning differently than their majority colleagues. Specifically, the perception exists among Asians, more so than Caucasians, that workplace conditions facilitate team learning. Likewise, the perceptions of African-Americans differed from Caucasians with respect to perceptions

regarding the work created in teams. African-Americans, more so than Caucasians, perceive the work generated by teams is more readily accepted by the organization. These findings may be related to cultural differences and should be studied further.

### ***Interpretation and Application of Team Learning Model***

The Team Learning Model depicts the group and organizational conditions that merge with learning processes to reveal collective learning and organizational outcomes (Dechant and Marsick, 1993). This study specifically examined the variables which predict team learning outcomes. The research findings of this study supported the model. For example, the model lists group conditions of skills and knowledge, values, rewards, structure, time, communication, and readiness for change. Those conditions were applicable to the team learning processes variable especially with respect to team members modifying their thoughts and behaviors based on what is learned from other team members.

The outcomes are consistent with the model's collective learning outcomes. The collective learning outcomes indicate a team is generating new or revised ways to learn and work. Also, the collective learning outcomes advise that the team functions from revised norms, enhanced quality of the work output, and changed ways of thinking (Dechant and Marsick, 1993). These factors are evidenced by the nursing team at ABC Hospital scoring 35.92, which falls within the favorable range of 32 to 49. These findings also suggest that the nursing team is effectively functioning as a learning team.

This quantitative study has shown that 70 percent of team learning outcomes is explained by team learning processes. Subsequent studies that apply a similar quantitative approach, and find a similar explanation of variance might suggest a revision to the team learning model.

### ***Recommendations for the Team Learning Survey***

The *Team Learning Survey Facilitator Guide* was developed around 1993. Although the team learning conditions variable and the organizational learning conditions variable have subcategories, there appears to be no information about interpreting the scores for the variables. Scores can only be analyzed from the subcategories of each of the variables. Also, there is only limited information about interpreting the scores for each of the subcategories.

The phases or modes of team learning processes progress from fragmented to pooled, to synergistic. However, the literature indicates an additional mode of continuous. The continuous mode is not a possibility or even mentioned in the *Team Learning Facilitator Guide*. Also within the *Team Learning Facilitator Guide* is one chart depicting organizational learning outcomes. Organizational learning outcomes is not described in the *Team Learning Facilitator Guide*, however, the Team Learning Model addresses the organizational learning outcomes. It is assumed that the chart in *Team Learning Facilitator Guide* which references organizational learning outcomes is actually referring to organizational learning contributions, since organizational learning contributions is previously identified and described in the guide, and the literature.

The team learning variables seem to ask similar or overlapping information. This may contribute to the variables being so highly significant ( $p < .0001$ ) with one another. The purpose of this research was to examine the interaction of the variables. This was difficult to discern due to the multicollinearity issue.

### ***Recommendations for Practice***

The nursing profession typically works in teams. The findings of the study indicate the nurses at ABC Hospital learn and work collectively in providing care for patients. However, the findings also suggest that both ABC Hospital and the hospital's nursing administration could consider ways of making the nursing team feel more a part of the hospital team. It is not surprising to become aware of such a finding in organizations with hierarchical structures (Peters, 1997; Pinchot, 1993). Kreutzer (1995) suggests a systems approach in lieu of the traditional hierarchical structure is the key to effective team learning and enhanced organizational effectiveness. In fact, Kreutzer (1995) concludes that without breaking down hierarchies and empowering people with the tools and resources needed to create a shared vision, team learning will fail. "People will just get stuck in their individual mental models, identify with their 'positions,' and fixate on their personal assumptions about 'how things really work around here'"(p. 240).

It is especially important to note that the effective team learning which occurs at ABC Hospital is in no way indicative of the need to reduce the number of team nurses to accommodate more patients. In fact, to insure the nurses continue to provide quality health care to patients and represent the hospital in a professional manner, the nursing administration should investigate ways to improve the team learning which already exists. The rules, procedures and policies of the nursing administration and the hospital must focus on the systems approach of strategically planning increased organizational intelligence.

The nursing administration could benefit from the wealth of knowledge acquired as teams collectively learn and work. However, to maximize organizational effectiveness, the administration must welcome, employ, and institutionalize a managerial style that is

perceived by the nurses as beneficial to their daily work responsibilities. Pinchot (1993) believes organizations need to implement a flatter, collaborative standard of managing for the knowledge era. Fulmer (2000), Kasl, Dechant and Marsick (1997), Marquardt (1996), Rolls (1995), and Senge (1990) believe the flattened organizational structure functions better from a systems approach. The systems approach subscribes to a more integrative approach to problem solving which is indicative of team learning (Rolls, 1995; Silverman & Casazza, 2000; Watkins & Warsick, 1993; Wright, 1989).

### ***Recommendations for Further Research***

The present study is the only study known to the researcher that examines the interaction of the team learning variables. Further research should be conducted into the interaction of the variables. Such research may add to the understanding of promoting learning within teams.

Evaluating the factors which predict organizational learning contributions could further the knowledge of the extent to which team learning is accepted within the organization. Future research could replicate this study and further validate understanding of team learning with respect to management versus subordinates. It would be important to note whether team outputs are perceived differently by managers and subordinates. Such knowledge could assist in transitioning knowledge from the team to the organization. The knowledge could also be instrumental in fostering a systems approach.

Additional research needs to be conducted regarding the work and demographic variables with respect to team learning variables. Inquiry should be made into which work and demographic variables impact the team learning concepts more than others. The findings of this study indicate that ethnicities differ on perceptions regarding the team learning variables.

The potential impact of culture on orientation toward team learning can be most interesting for screening, hiring, and training implications, and provide more in depth insight into team learning. Such insight could expand this study and assist organizations in promoting knowledge and improving work effectiveness. Further research can also provide organizations with information that can be used to identify weaknesses and work towards improving them. It can also identify strengths which could be used in mentoring or on-the-job training programs.

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## **Appendices**

**Appendix A**  
**Cover Letter to Sample**

## Appendix A - Cover Letter to Sample

Dear Nurse:

My name is James L. Corpening, Jr., and I am a doctoral candidate at North Carolina State University studying a concept known as team learning. Marsick and Dechant (1993) developed a team learning survey which measures the processes, conditions and contributions of team learning. I am particularly interested in using their survey to examine how nursing teams learn as a process and output of team work.

It comes as no surprise to you that ABC Hospital has been repeatedly ranked and rated as one of the top 50 hospitals in America. I believe the hospital's nursing teams play an integral role in the hospital's success. Therefore, my interest is in the nurses at ABC Hospital, and the extent to which they learn in teams. You have been selected from a random sampling process to participate in this study. I ask that you please complete the enclosed survey that will take you approximately 35 minutes, and return it in the self-addressed envelope. Please know your responses will be held in the strictest confidence. As you will note, I coded each survey for record keeping purposes only. Please know completion of the survey is voluntary, but also know that I really need your participation. Your decision whether or not to participate will not affect your relationship, employment or status with ABC Hospital. Your returning the survey indicates your consent to participate.

Learning to learn together is critical for nurses in collectively providing care for patients. With a shortage of nurses in North Carolina the need to work efficiently is essential. The survey findings should be helpful in understanding nursing teams at ABC Hospital. The survey findings should also assist the nursing administration in identifying strategies to support the nursing teams in working more efficiently and effectively.

**Please return the Response Form and Part 3 of the survey to me prior to Friday, March 22, 2003.** Should you have any questions or concerns, I invite you to contact me at (919) 550-8445 or by email at [jcorpening@aol.com](mailto:jcorpening@aol.com). Or, you may choose to contact my university advisor, Dr. John Pettitt, at (919) 515-6291.

Sincerely,

James L. Corpening, Jr.

## **APPENDIX B**

### **Team Learning Survey**

## APPENDIX B – Team Learning Survey

### Part 1

**Directions:** Using the scale below, determine the extent to which you agree with each statement. Think about each statement in terms of your present experience with your nursing team. Record all your responses by circling your answers on the Response Form.

#### Rating Scale

FA	=	Firmly Agree
MA	=	Moderately Agree
SA	=	Slightly Agree
N	=	Neither Agree nor Disagree
SD	=	Slightly Disagree
MD	=	Moderately Disagree
FD	=	Firmly Disagree

*In our work team...*

1. the end products of our work include performance improvements.
2. members share the results of their personal insights or learning with one another.
3. we often learn through trying out new behaviors.
4. we build upon one another's ideas.
5. members do *not* have the opportunity to define and develop the team's objectives.
6. we find that we need to balance getting the task accomplished with building relationships among members.
7. the end products of our work include new approaches to work.
8. we learned to drop our departmental perspectives and think from an organization-wide perspective.
9. we change our perspectives about ourselves and others.

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10. we try to understand one another's viewpoints.
11. speaking one's mind is *not* valued.
12. members take sufficient time to get to know each other before working on the task.
13. the end products of our work include new ways of thinking.
14. we often revise our viewpoints based on input or new information from others outside the team.
15. members try out new approaches to their jobs as a result of the team's work.
16. most members are open to new ideas or ways of thinking.
17. people do *not* feel free to express their negative feelings about changes.
18. we are developing beliefs, values, and guiding principles.
19. the end products of our work include new social norms.
20. the act of working collaboratively results in greater learning for each of us than if we had worked alone.
21. we generally incorporate the perspectives of most members in analyzing problems and making decisions.
22. we look at issues from multiple perspectives.
23. we spend much time gaining clarity around our purpose and structure.
24. the end products of our work include new ways of managing.
25. we often find that our views of the problem change as a result of our team discussion.
26. we invite people from outside the team to present information or have discussion with us.
27. team effort is valued over individual achievement.
28. we discuss our feelings as well as our thoughts.

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29. the end products of our work are of much higher quality than any one of us could have produced alone.
30. we listen to the perspectives of every member in the team.
31. we generally revise our viewpoints based on input or new information from others outside our team.
32. most members are able to express their thoughts clearly.
33. the end products of our work include new work processes or procedures.
34. members change their behavior as a result of seeing other team members change.
35. we share what we learn from our team with others outside the team.
36. we try to capitalize on each other's strengths and compensate for one another's weaknesses.
37. we challenge our basic beliefs or assumptions about the issues under discussion.
38. we increase our knowledge base by going outside of our team for information.
39. members feel valued and appreciated by one another.

## **Part 2**

### *In this organization...*

40. we have made significant progress over the past year toward becoming a "learning organization."
41. managers are adept at motivating and directing the energies of their work teams.
42. people who help others learn how they can be more effective in their jobs are *not* rewarded by the organization for their efforts.
43. the establishment of work teams, networks, and other collaborative arrangements has helped the organization adapt and change.

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44. individuals have sufficient freedom to make decisions critical to success.
45. senior management does *not* serve as a model for new ways of working together with people from other parts of the organization.
46. there are systems in place for conveying the findings from work teams to the right people throughout the organization.
47. supervisors generally support the ideas and recommendations of their work teams.
48. people are *not* encouraged to help one another across divisions or functions.
49. work teams and networks are used successfully as mechanisms for transferring ideas up the line and across the organization.
50. continuous learning for performance improvement is valued.
51. senior management “practices what it preaches” when encouraging new ways of working or managing.
52. there are many obstacles to working together with people from other parts of the organization.
53. team efforts are supported along with the ideas and recommendations of work teams.
54. involvement in work teams, task forces, or similar groups is *not* rewarded.
55. work teams, task forces, and the like have been responsible for many organization-wide changes.
56. senior management generally supports the ideas and recommendations of work teams, committees, task forces, etc.
57. people who help others learn are highly valued.
58. we have become much more innovative in our products and services over the past year.
59. employees can challenge higher level managers without being punished.
60. we are becoming more effective at anticipating and adapting as an organization to environmental change.

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### Part 3

61. What is your ethnicity?

- African-American
- Asian
- Caucasian
- Latino (Hispanic)
- Native American
- Other \_\_\_\_\_

62. What is your gender?

- Female
- Male

63. Indicate the highest nursing degree you have obtained: (Check only one)

- Associate Degree in Nursing
- Diploma in Nursing
- Bachelor of Science in Nursing
- Master of Science in Nursing
- Doctorate in Nursing

64. How many years have you worked as a nurse? \_\_\_\_\_

65. How long have you worked as a nurse at ABC Hospital? \_\_\_\_\_

66. You are considered which of the following: (Check only one)

- Full-time employee (work 72 or more hours bi-weekly)
- Part-time employee (work less than 72 hours bi-weekly)

67. What is your age?

- 20-24 years
- 25-29 years
- 30-34 years
- 35-39 years
- 40-44 years
- 45-49 years
- 50-54 years
- 55 and above

68. What is your current annual salary?

- \$25,000 - \$29,999
- \$30,000 - \$34,999
- \$35,000 - \$39,999
- \$40,000 - \$44,999
- \$45,000 - \$49,999
- \$50,000 - \$54,999
- \$55,000 - \$59,999
- \$60,000 - \$64,999
- \$65,000 - \$69,999
- \$70,000 - \$74,999
- \$75,000 and above