ORGANIZATIONAL LEARNING CAPACITY AS A PREDICTOR OF INDIVIDUALS’ TENDENCY TOWARDS IMPROVISATION IN NONPROFIT ORGANIZATIONS IN SAUDI ARABIA

Saleh Mohammad Alhumaid

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APPROVED:
Simon A Andrew, Major Professor
David McEntire, Committee Member
Gary Webb, Committee Member
Abraham Benavides, Chair of the Department of Public Administration
Tom Evenson, Dean, College of Public Affairs and Community Service
Costas Tsatsoulis, Dean, Toulouse Graduate School
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The study is undertaken for a more compressive understanding for organizational theory and its applicability to tendency towards improvisation during emergency times among individuals in Non Profit Organizations (NPOs) in Saudi Arabia. The analysis involved an examination of direct effect of learning on tendency towards improvisation and possible mediating effects between organizational learning and tendency towards improvisation among individuals in NPOs, while controlling for key demographic differences (e.g. individuals’ age, education level and years in service, number of full-time staff and volunteers). Self-administered questionnaires were distributed to full-time employees in 13 NPOs in three cities in the western area of Saudi Arabia, namely Jeddah, Makkah and Madinah (N= 304). The main statistical method employed to hypotheses examination was Structural Equation Modeling.

The hypothesis examination resulted in three out of five hypnotized paths are to be significant. Two direct relations were interpreted as outcomes of organizational learning, with increases in the level of organizational learning is being positively related to individuals’ self-efficacy and agility. The third significant path interpreted as individuals’ agility is positively related to their tendency to improvise during emergency times, which indicates organizational learning has indirect effect on tendency towards improvisation. Finally, the applicability of organizational learning theory to the field of emergency management and suggestions for future research in light of the findings of this research are also discussed.
ACKNOWLEDGEMENT

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CHAPTER 1

INTRODUCTION

Non-profit organizations (NPOs) have played vital roles in solving problems and issues across all societies. Following the occurrence of various disasters and crises, NPOs offer significant services to the victims of these incidents. For example, the response system (federal, state, regional and municipal agencies) to 9/11 attack was composed of 1,607 organizations. About 1200 of these organizations were philanthropic organizations (Kapucu, 2007). Moreover, the General Accounting Office (GAO) reported that 34 of the charities raised $2.4 billion. In fact, the GAO mentions that the money has been raised is more than this amount, but providing a reliable figure is not possible because the number of charities participated in collecting funds for the survivors 9/11 exceeded 300 charities (in Kapucu, 2007, p. 556).

Gibbons (2007), based on the Duke university Non-governmental Organization Research Guide, provided several advantages for the involvement of NPOs in disaster response and recovery. These features are classified in four broad categories: (1) community involvement and strong grassroots links (2) flexibility and adaptability (3) long term commitment and follow-through sustainability (4) cost effectiveness. These advantages clearly show the importance of improving organizational capacities for NPOs. Traditionally, there are three components of productions (i.e. land, labor and physical capital) where various organization continuously attempt to increase their capacities.

While earlier economists have focused on investment in physical capital, increasing instability in the 1960s, 1970s and 1980s (i.e. many economic and social changes) has shifted the attention to human resources as the main source of effective performance and adaptability.
to challenging circumstances. This shift was labeled under different names such as human resources, human capital and intellectual capital. Organizations working in the context of Emergency Management (EM) are encountered by a far more turbulent environment that exemplifies the need for great concern about the development of human resources.

A main mechanism through which organizations can enhance its intellectual capital or the capacities of their human resources assets is Organizational Learning (OL). Although a great amount of literature has examined OL, little effort has been made to explore the influence of learning process in organizational contexts on human resources capacities in disaster related organizations. This is important because professionals need to have a strong understanding of the link between everyday practices and the ongoing learning process and, consequently, the effectiveness of their organizations during times of crises.

Problem Statement and Rationale

In the aftermaths of large-scale disasters, ambiguity and confusion often present and there is a combination of established and emergent activates and unforeseen problems and conditions. To succeed in such an environment, organizations active in disaster need develop their capacities such as flexibility, agility and improvisation to adjust their responses to match the needs of situations (Webb, 2004). An important condition to develop these capacities is the ability of organizations to learn.

Research apply OL to EM are characterized by three features that may have led to overlook internal organizational behavior and practices. First, although some studies in the field focused on individual level (e.g. Webb, 2004; Vaughan, 1999; Clarke & Perrow, 1996), most
studies are dominated by concerns with macro behavior. This neglect perhaps due to the nature of disaster response system that takes most of its actions through collective plans. Disaster response often takes place through national or regional formworks. However, research consistently shows that these frameworks sometimes fail or collapse. Consequently, organizations became isolated and start to response on their own (e.g. Hurricane Andrew, Hurricane Katrina). In some parts of the world, the collective framework is essentially weak. In addition, in most time these collective frameworks do not take place in the aftermath of disasters and need time to take place. As a result, effectiveness when responding to disasters may become an organizational not a collective matter.

Moreover, even if organizations work within collective arrangements, disaster scholars have stress that disaster response influenced by preexisting social structures. Thus, the performances of organizations within collective arrangements are largely influenced by the style of their daily performance that precedes the occurrence of disasters. As a result, this macro perspective does not help organizations to fully understand how to develop their capabilities prior to disasters. Besides, this external or macro emphasis does not explain why some organizations are more successful in responding to disasters than others.

Second, learning studies in the field of EM are often conducted in a retrospective manner exemplified in the form of “lesson learned.” Despite the value of these studies, Birkland (2009, p.146) asserts “post-disaster ‘lessons learned’ documents are often ‘fantasy documents’.” According to him, these documents result rarely in ‘serious’ learning processes because they are not usually investigating real causes and solutions to disasters. Instead, post-
disaster ‘lessons learned’ are produced to show that some authoritative person has made something about a disaster.

Similarly, Donahue and Robert (2006) assert that while identifying lessons is rather straightforward, the process of learning is much harder. This is why, according to them, lessons claimed to be learned are often not really learned and they repeatedly reoccur in subsequent events. In fact, in an uncertain world, as the case in EM, history does not necessarily repeat itself. The capacity to learn may be more significant than experience (Ritchie, 2004). Yet, the relation between managerial practices at the organizational level that affect the capacities of individuals to learn in the field of EM has been rarely examined.

OL theory is one of the most valuable organizational theories that can inform how organizations influence the capacities of individuals when responding to disasters because OL theory clearly has “human dimension.” OL theory has internal mechanisms that influence the capacities and the abilities of individuals to absorb and process information and new knowledge (Cohen & Levinthal, 1990). Thus, examining the relationship between OL patterns and human resources’ capacities in the context of EM is critical for the understanding the effects of internal behavior and how to develop responses’ capacities.

Third, literature on OL in EM discloses largely descriptive research concerning the presence or absence of OL. The particular effects of OL within disaster-related organizations and its relationship to important outcomes, such as agility and improvisation, that are key factors for an effective disaster response, are rarely inspected. Additionally, studies that link themes related to OL theory such decentralization are mostly qualitative studies. Experiential studies on OL are needed to assist to clarify and consolidate the concept theoretically in order
to appropriately apply it in particular context. However, empirical studies are very rare in the field of EM.

This desertion will fill the gap by avoiding the mentioned drawbacks and conducting an empirical study that give a broad analysis at conceptual level. This will be done by focusing on the ongoing learning process and practices in organizational settings.

**Aims of the Study**

The dissertation focuses on the relationship between OL and tendency towards improvisation among individuals in NPOs in the western area of Saudi Arabia. This will be done by examining the direct effect of OL and possible mediating effects between OL and individuals’ tendency towards improvisation, while controlling for demographic differences that may affect the structural relationships among central constructs. The study aim to inform administrators at all levels in NPOs as well as other organizations working in the context of EM about the implications and significance of management style and the patterns of social communications in ongoing learning practices that preceded the occurrences of disasters. OL theory served as the theoretical foundation that guide this research. The research questions directing this dissertation are:

1. What are the relations between OL and individuals’ self-efficacy, agility and tendency to improvisation in NPOs?
2. Does self-efficacy have positive impact on the tendency of individuals to improvise in NPOs?
3. Does individuals’ agility influence their tendency to improvise during disasters in NPOs?
Relevance of the Study to Emergency Management

Kreps (1990) indicates that there has been great debate among emergency officials over the history of FEMA and its predecessors agencies about the appropriateness of the bureaucratic model compared to a more flexible and decentralized model. The bureaucratic model to EM, which is also called command-and-control model, grew out of the cold war influenced by the military doctrine. The main assumption of this model is that in the aftermath of disasters there will be chaos, which result from panic, breakdown of social order and anti-social behavior. This chaos can only be regulated through centralized, controlled and clear-cut hierarchies (Dynes, 1994).

These hierarchies are characterized by clearly defined objectives, formal structures, division of labor and policies and procedures that direct various organizational activities (Schneider, 1992). All these elements are delineated in formal documents that are called planes. Consequently, unplanned or emergent activities will be a “disruptive behavior.”

Ironically, a central feature of this style of management is that it assumes the satiability of the outer context, whereas the bureaucratic assumption of disasters is that there would be total chaos.

Tierney (2003) stresses that disasters always include elements of surprise that pose organizational improvisations (e.g. evacuation of hundreds of thousands of people from Manhattan through totally unplanned networks of watercrafts). In addition, air traffic controllers across the US improvised by grounding all aircraft within the country after the 9/11 attack (Wachtendorf, 2004). Moreover, private organizations may become actors in emergency
Furthermore, tens of voluntary and nonprofit organizations always often contribute in emergency response.

Advocates of the flexible approach emphasize that, this spectrum of established and emergent social arrangements far beyond the scope of centralized and hierarchical structure. Many decisions within these arrangements are instant and need to be impoverished. Thus, “without improvisation, EM loses flexibility in the face of changing conditions” Kreps (1991, p. 33). However, we have little empirical work on how organizations achieve agility and flexibility crucial to a successful response.

Researchers who advocate a flexible approach rarely provide a detail prescription of what managers and executives in disaster related organization must avoid before the occurrences of disasters in order not to be trapped in a rigid organizational structure. A part from general and abstract recommendations such as suggesting loss or minimal structures, encouraging creativity, coordination and cooperation, there are no sophisticated managerial accounts that provide guidance for officials in the field of emergency managers at all levels. This abstract is apparent in the lack of consensus about the name of the model. For example, the model has been termed as the flexible, problem solving and agile model (see for example Harrald, 2006; Neal & Phillips, 1995; Dynes, 1994).

OL theories exhibit similar characteristics to the recommendations given by proponents of flexible organizational structure. OL theories strongly recommend delayering organizations, cooperation and do not see the organization as a close system. Thus, applying these theories provide helpful directions that bring the gap between theoretical and practical levels and inform managers about the appropriate management practices to deal their everyday activities, and
the impact of these daily practices on the capacities of organizational response during times of emergencies.

Furthermore, Neal and Phillips, (1995) underline the importance of building emergency practices on the capacity of the social capital (e.g. individuals, nonprofit organizations) to empower the community and effectiveness of response to disasters. They stress that the pre-existing social structure is always the most effective structure to cope with disasters. The underlying assumption here is that these “social units” are always the first responders. Thus, they should be valuable resources in EM. Consequently, increasing the awareness of executives in NPOs about importance management themes is very likely to increase the capacity and the performance of these organizations.

For the sake of this study, the researcher accepts the assumption that flexible management style is the most effective and appropriate approach to respond to disasters. Another assumption accepted is that potential outcomes of flexible approach to EM can be measured at different levels, including individual, organizational and intra-organizational levels. McDonald and Warburton (2003) point out that NPOs are generally organized to be more participative, responsive and flexible. Therefore, they provide unique organizational settings to examine the themes, such as flexibility and nimbleness, which have been emphasized by advocates of flexible model. This study will examine these outcomes at individual level.

Organization of the study

The introductory chapter of the study introduces the problem statement and rationale of this study. This chapter also describes the specific aim of this study and its relevance to the field of EM. Chapter 1 concludes with an overview of the organization of the study. The
following chapter proceeds with a thorough review of the literature on OL theory and related
literature. A brief overview of what is OL and where it occurs are first presented. Then, a more
detailed exploration of development of OL theory, including various scholars’ view of the major
elements that are critical for OL and the contributions of these works to the theory of OL.

Chapter 3 provides an overview of learning in the field of EM and NPOs and highlights
the obstacles for learning in these fields. Reveling these obstacles explains why researchers in
EM need to pay attention to the ongoing learning process within organizational settings.
Chapter 4 presents a comprehensive analysis of the theoretical framework and the hypothesis
examined in this study.

Chapter 5 presents research design and methodology, including a detailed description of
the study site and the justification for the appropriateness of the study’s site for emergency
studies. Besides, the procedures employed for data collection and the study’s population is
described. The main thrust of Chapter 5 addresses the theoretical justifications of the
measurements of each latent construct used in this study. This chapter concludes by providing
an overview of the strength and weakness of the statistical method used in this study structural
equation modeling (SEM) and describing its fit indices.

Chapter 6 presents an analysis of data preparation and a brief description of descriptive
statistics of the data used in this study. It also outlines the steps undertaken to develop the
measurement model will be used in this study. Chapter 7 presents the results of path analysis
and postulated hypotheses in this study. Chapter 8 concludes this study by providing an
overview of the research, the contribution of this paper to the field of EM. In addition, the
limitations of this research and recommendations or suggestions for the directions of future research are identified.
Despite its importance, the concept of OL is quite problematic because OL literature lacks a unified definition and there is little consensus on what the concept means. In addition, there is no agreement about what level learning is better understood (Rubenson, 2011; Dodgson, 1993; Fiol & Lyles, 1985). This chapter presents relevant literature on these axes. Then, various theories that contributed to the development of OL theory will be discussed.

Conceptual Definition of Organizational Learning

Scholars have offered many conceptions of learning. For example, while some literature considers learning as improvement of outcomes, other literature understands learning as change of organizational knowledge. The latter view is also divided into two subsets: the recording of knowledge and the evolution of knowledge (Schulz, 2002). Learning as improving assumes that learning automatically benefits organizations. Learning as recording recognizes OL as recording of organizational knowledge through which organizations can maintain, distribute, and reclaim solutions found in previous experiences meaning the learning in this perspective is historical. Learning as evolution of knowledge focuses on processes that bring about modification in organizational knowledge (Schulz, 2002).

Similarly, Gupta, Sharma and Hsu (2004) indicate that there are different stresses when discussing the concept of OL. For example, the learning process may stress specific knowledge, procedures and process that apply to a specific context. This type of learning process rarely
leads to significant changes. Another emphasis of the learning process is learning new job skills that can be transferable among different contexts. This type usually occurs by bringing outside experience to trigger the change in organizational context. In fact, these two types usually present the most straightforward types of learning in organizational contexts.

A different emphasis of the learning process is learning to adapt. This type, according to Gupta et al. (2004), occurs in dynamic situations. Here, the learning process is derived from lessons of successes and failures. Indeed, most literature in the context of EM has centered on this type of learning outcomes. They examine how these organizations learned to cope with issues arising from the response (e.g. coordination and communication issues) and provide recommendations for these organizations in the form of ‘lessons learned’ from mistakes that occurred during responses to disasters. According to Madsen (2009), there is a great investment by government and private organizations to extract and analyze ‘lessons learned’ from these crises.

The last emphasis of the learning process is learning to learn. In this type, organizations challenge the basic assumptions of their knowledge and reframe them continuously. Instead of adapting to the future, the organization actively design their future. According to Senge (1990), a learning organization is continuously increasing its capability to “create its future.” The above discussion implies that OL is not an easy concept to define. As Ulrich, Von Glinow and Jick (1994, p. 57) state, “the concept of organizational learning has become a management Rorschach Test. One sees whatever one wants to see.”
This dilemma can be attributed to the fact that OL has been approached from various disciplines from different angles because disciplines vary greatly in the domains of their interests and focuses. For example, while, economists and business literature tend to examine the outcome of the learning process, psychologist and organizational theorist are concerned with the process itself (i.e. what learning is and how outcomes can be achieved) (Dodgson, 1993). Easterby-Smith (1997) provides a thorough account of the contributions, ideas and problematics of the concept of OL in various disciplines. The key points are summarized in Table 1.

Table 1: Contributions and Critiques of disciplines of organizational learning.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Ontology</th>
<th>Contributions/ideas</th>
<th>Problematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology and OD</td>
<td>Human development</td>
<td>Hierarchical organization; importance of context; cognition; underlying values; learning styles; dialogue.</td>
<td>Defensive routines; individual to collective transfer.</td>
</tr>
<tr>
<td>Management science</td>
<td>Information processing</td>
<td>Knowledge; memory; holism; error correction; informing; single and double loop.</td>
<td>Nonrational behavior; short vs. long term; information overload; unlearning.</td>
</tr>
<tr>
<td>Sociology and organization theory</td>
<td>Social structures</td>
<td>Effects of power structure and hierarchy; conflict is normal; ideology and rhetoric; interests of actors.</td>
<td>Conflict of interests; organizational politics.</td>
</tr>
<tr>
<td>Strategy</td>
<td>Competitiveness</td>
<td>Organization–environment interface; levels of learning progressively more desirable; networks; importance of direct experience; population-level learning.</td>
<td>Environmental alignment; competitive pressures; general vs. technical learning.</td>
</tr>
<tr>
<td>Production management</td>
<td>Efficiency</td>
<td>Importance of productivity; learning curves; endogenous and exogenous sources of learning; links to production design.</td>
<td>Limitations of unidimensional measurement; uncertainty about outcomes.</td>
</tr>
<tr>
<td>Cultural anthropology</td>
<td>Meaning systems</td>
<td>Culture as cause and effect of organizational learning; beliefs; potential cultural superiority.</td>
<td>Instability and relativity of culture as barrier to transfer of ideas; whose perspective dominates?</td>
</tr>
</tbody>
</table>


Although the concept is ambiguous, the definition of OL commonly embraces two broad areas: (1) the mechanisms used in organizational context to promote learning (i.e. gathering,
evaluating, assessing, and questioning, storing and using information); (2) the outcomes of the learning process (Ellis, Margalit & Segev, 2012). For example, Senge (1990, p. 253) define learning as “an inquiry that results eventually in new understanding and new behavior - that is, learning.” Edwards (1997, p.16) define learning as “a process of personal growth and discovery, not just an accumulation of knowledge”.

Levels of Analysis

There are two main opposing views in OL literature concerning the level at which learning occurs in organizational settings. While some scholars advocate the view that organizations learn, others believe that learning takes place at individual level. Supporters of the organizational level believe that individuals are important for OL. However, organizations are not merely the sum of individuals within these organizations (Fiol & Lyles, 1985). The following statement stated by Hedberg (1981) may provide the best summary of this viewpoint:

> Although organizational learning occurs through individuals, it would be a mistake to conclude that organizational learning is nothing but the...Organizations do not have brains, but they have cognitive systems and memories. As individuals develop personalities, personal habits, and beliefs over time, organizations develop worldviews and ideologies. Members come and go, and leadership changes, but organizations' memories preserve certain behaviours, mental maps, norms, and values over time. (in Fiol & Lyles, 1985, p. 803).

For example, Cook and Yanow (1993) argue that the vehicle for OL is organizational culture not cognition because OL refers not to the capabilities of individual members of the organization to learn, but to the capacity of the organization as a whole. According to their
view, Knowledge is created and transmitted at the organizational level throughout cultural artifacts that are not developed and evolved individually, but collectively. The records in these artifacts and documents constitute organizational memory.

Cook and Yanow (1993) provided the work of a symphony orchestra as an illustration of their view. They argue that a person from a symphony orchestra cannot do a song with a new symphony orchestra without practicing with the new orchestra, even if he or she knows the song. A main criticism of these studies is that OL should be understood from a cultural rather than a cognitive perspective. Proponents of the cognitive perspective believe culture is only one component of the learning process (e.g. Zhang & Sternberg, 2011).

The individual perspective contends that learning applies only to individuals because organizations have no memory. Despite the claim that computers in organizations present a kind of organizational memory, this view stresses that organizations do not have memories or brains even in any typical sense (Fineman, Gabriel & Sims, 2009). Even when assuming that organizations do have memories, this approach maintains that memory and learning are distinctive from each other. This is because psychological research shows that learning has to do with questions whereas memory has to do with retention (Kim, 1998).

Argyris and Schön (1978) are among the earliest scholars who identified this individual learning and OL quandary. Argyris and Schön (1978, p. 9) state:

*There is something paradoxical here. Organizations are not merely collections of individuals, yet there are no organizations without such collections. Similarly, organizational learning is not merely individual learning, yet organizations learn only through the experience and actions of individuals. What, then, are we to make of organizational learning? What is an organization that it may learn?*
Argyris and Schön (1978) propose a theory of learning for this dilemma in which they contend that OL occurs through individuals whose actions are grounded in shared mental models. Mental models are assumptions that result from previous experiences and shape the perceptions of individuals in a specific organization and influence the way they act how they plan, execute and review their actions. Senge (1990, p. 185) describes them as “the internal picture of how the world works.”

Other levels for studying learning have also underlined by other others. For example, Ellström (2011) points out some studies have concentrated on studying learning in groups or team level. Yet, according to Edmondson (2002) (as cited by Ellström, 2001, p. 236), this approach is virtually similar to individual studies because the depiction of the learning cycle is the same (cognition, action, feedback and reflection). Ellström (2011) also indicates that studies of OL have focused on, which is intra-organizational learning. The assumption of these studies is that organizations increasingly work in networks. Thus, it is essential for these organizations, if they want to survive in this complex environment, to learn how to cooperate and develop competencies that are critical in such contexts. Literature that emphasizes OL in the context of EM largely falls into this category of analysis.

Development of Organizational Learning Theory

There have been many scattered accounts from early times in the 20th century on the notion of learning. For example, Dewey (1938) airs the idea of experimental learning as a continuing process of activities. Craik (1943) introduced the notion of “mental models”. Furthermore, McGregor (1960) stressed the influence of management styles on the learning
and innovation of employees in the workplace. Yet, the concept of OL gained importance in the 1950s when the economic models of the firm (Schulz, 2002).

Behaviorists such as March, Simon, and Cyert challenged the economic model, which present the dominant views at that time, as being very simplistic and conflict with empirical evidence. In contrast to the economic model, behaviorists advocate limited-rational adaptation perspective through modifications of routines. The term of OL was coined in 1963, when Cyert and March's The Behavioral Theory of the Firm was published. They perceived OL as an adaptive process that results from experience over time (Schulz, 2002).

Another important scholarly work is that developed by March and Olsen (1975). They indicate that rational adaptation that characterizes learning models at that time is naïve because goals are vague or in conflict leading to a prevalence of ambiguity. In turn, previous experience can be misleading. March and Olsen (1975) investigated four conditions showing that hat improvement may result from other factors such as beliefs, trust, and perceptions other than learning in organizational context even when learning occurs and new ideas by members of an organization developed.

A major breakthrough in the field of OL was developed by the work of Argyris and Schön (1978) who invented the concepts of single- and double-loop learning. Argyris and Schön (1978) maintain that there are two types of OL: single- and double-loop learning. In single-loop learning, members of the organization do not challenge the goals or values from which current actions are derived. Instead, they aim to detect errors from predetermined norms and correct them. Double-loop learning, in contrast, questions the underlining assumptions of the current
processes and the validity of these assumptions continually. Figure 1 shows the direction of single- and double-loop learning.

Figure 1: Single and Double-loop Learning.

Source: Argyris (2005, p. 264)

Argyris and Schön (1978) contrast two theories: espoused theories and theories-in-use. The former define the values people believe that their actions are based upon and the latter govern the action. While people are aware of the espoused theories, Argyris and Schön (1978) stress that, most people are not aware of the theories-in-use. Theories-in-use “govern our actual behavior and tend to be tacit or unspoken language” (MacKay, 2007, p. 160).

According to Easterby-Smith and Lyles (2011, p.20), a main contribution of this theory to OL is that it “laid the field as a whole very clearly” and illustrates the clash between espoused theories and theories-in-use. Furthermore, the concepts of single- and double-loop learning explicitly illustrates that human behavior does not follow economic rationality through introducing the notion of ‘defensive routines’, which lead to inhibition of learning (Easterby-Smith & Lyles, 2011). Defensive routines are “thoughts and actions used to protect individuals', groups', and organizations' usual ways of dealing with the reality” (Argyris, 1985. P, 5).
The emergence of single and double loop theories has led to developing similar notions. For example, Fiol and Lyles (1985) maintained that literature categorize learning as behavioral versus cognitive and low level versus high-level learning. While lower-level learning evolves from repetition and routine and result in incremental changes, higher-level learning challenge and alter underlying policies, values and norms rather than particular activities or behaviors. Fiol and Lyles (1985) contend single-loop learning present lower-level learning.

Likewise, March (1991) identifies two types of learning strategies: ‘Exploration’ where members approach new strategies and procedure and ‘exploitation’ where they modify existing ones. Flood and Romm (1996) developed the concept of triple loop learning. The first two loops are the similar to those developed by Argyris and Schön (1978). The third loop is reflexive and concerned about how members of the organization effectively carry out the first two loops.

Morgan (1997) in his well-known book Images of Organizations, provide eight different metaphors that can be used as lenses to understand organizational contexts. In the metaphor organization as a brain, he provides steps that are required for double loop learning, which are:

1. Sensing, scanning and monitoring the environment
2. Comparison of this information against operating norms
3. Questioning whether operating norms are appropriate
4. Initiating appropriate action course.

However, Morgan stresses that organizations must possess capabilities to do both types of learning because they need both of them.

The publication of Senge's work The Fifth Discipline has been considered by many scholars as having a profound impact on the recognition of the importance of knowledge in
organizations and popularized the notion of OL. This because this work laid out clearly the five essential features for building a learning organization:

1. Personal mastery which described as a continuous learning process that improves individual wholeness;
2. Mental models where an existing frame of reference, assumptions and values need to be examined for potential improvements;
3. Building shared vision;
4. Team learning;
5. Systems thinking, which is:

   *a conceptual framework, a body of knowledge and tools that have been developed over the past fifty years, to make the full patterns clearer, and to help us to see how to change things effectively and with the least amount of effort.* (1990, p. 7).

Senge (1990) differentiated between ‘generative’ and ‘adaptive’ learning. While, adaptive learning is the same as single-loop learning, which involves coping within the existing frame of reference in an organization, generative learning is a reflective and experimental type of learning.

Garvin, Edmondson and Gino (2008) maintain that research over the past twenty years has stressed three broad elements as critical for OL and they call them the building blocks. Table 2 depicts these blocks and their distinguishing characteristics. Another major development in the field is the work of Marsick and Watkins (1999) and Watkins and Marsick (2003, 1997, 1993). The theoretical framework developed by those scholars identified the dimensions of the learning organization which are (1) creating continuous learning
opportunities (2) promoting inquiry and dialogue (3) encouraging collaboration and team
learning (4) establishing systems to capture and share learning (5) empowering people toward a
collective vision (6) Connecting the organization to its environment (7) provide strategic
leadership for learning. According to the authors, these elements are essential to create a
learning culture and enhance organizational capacity to learn. Key results of learning are
financial and knowledge performances.

Table 2: Three Building Blocks of a Learning Organization.

<table>
<thead>
<tr>
<th>Building Block</th>
<th>Distinguishing Characteristics</th>
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<tbody>
<tr>
<td>A supportive learning</td>
<td>Employees:</td>
</tr>
<tr>
<td>Environment</td>
<td>• Feel safe disagreeing with others, asking naive questions, owning up to mistakes, and presenting minority viewpoints</td>
</tr>
<tr>
<td></td>
<td>• Recognize the value of opposing ideas</td>
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<tr>
<td></td>
<td>• Take risks and explore the unknown</td>
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<td></td>
<td>• Take time to review organizational processes</td>
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<tr>
<td>Concrete learning processes</td>
<td>A team or company has formal processes for:</td>
</tr>
<tr>
<td></td>
<td>• Generating, collecting, interpreting, and disseminating information</td>
</tr>
<tr>
<td></td>
<td>• Experimenting with new offerings</td>
</tr>
<tr>
<td></td>
<td>• Gathering intelligence on competitors, customers, and technological trends</td>
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<td></td>
<td>• Identifying and solving problems</td>
</tr>
<tr>
<td></td>
<td>• Developing employees’ skills</td>
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<tr>
<td>Leadership that reinforces</td>
<td>The organization’s leaders:</td>
</tr>
<tr>
<td>learning</td>
<td>• Demonstrate willingness to entertain alternative viewpoints</td>
</tr>
<tr>
<td></td>
<td>• Signal the importance of spending time on problem identification, knowledge transfer, and reflection</td>
</tr>
<tr>
<td></td>
<td>• Engage in active questioning and listening</td>
</tr>
</tbody>
</table>

Adopted from Garvin et al. (2008, p. 109).

A major contribution of Marsick and Watkins’ work is that it stimulated research on the
OL using the questionnaire developed based on this theoretical framework in diverse
organizational settings (Song, Chermack & Kim, 2013). Moreover, the questionnaire developed
by those scholars integrated many theories, such as adult learning, human resource
development and performance management (Song et al., 2013). Their questionnaire translated
to more than ten languages and used in a host of studies (Watkins & Marsick, 2003). Thus, one might argue that this work has improved the conceptual clarity of the concept of OL.

This chapter has presented an overview of the concept of OL. Chapter 3 denotes how OL has been viewed or how learning has been approached in the field of EM. In addition, the importance of learning for NPOs and what are the obstacles for learning in these organizations are represented.
This chapter provides an overview of learning in the field of EM and highlights the obstacles that hinder learning in the field of EM. This in turn, provides explanation why studies that examine the notion of learning need to consider another angel when approaching the concept of learning by examining the ongoing learning process within organizational contexts. Then, the notion of learning in NPOs is examined, including the reasons why NPOs need to learn and the barriers to learning in NPOs.

Organizational Learning in Emergency Management

Carley and Harrald (1997) maintain that there is the lack of understanding of the role of learning in disastrous events. Other authors noticed learning in the context of EM, in particular among practitioners, was viewed as analogous to planning. This orientation has received harsh criticisms in the last two decades (see for example. Harrald, 2006; Neal & Brenda, 1995; Dynes, 1994) and these criticisms are beyond the scope of this study. After realizing the misleading notion of planning, the majority of learning studies have attempted to draw on lessons learned from prior disasters.

The focus of this research is largely on extracting lessons at Intra-organizational level. These lessons cover various topics such as the role of information in increasing communities’ awareness to the threats that they may encounter (Kapucu, 2008); damage assessment (McEntire & Cope, 2004); interstate partnerships (Kapucu, Augustin & Garayev, 2009); the flow
of information during disasters (Militello, Patterson, Bowman & Wears, 2007); leadership capabilities (Kapucu & Van Wart, 2008); debris management (Swan, 2000); issues of race and ethnicity (Fothergill, Maestas & Darlington, 1999) and excessive unrequested donations (Neal, 1994).

Other studies that examine the concept of learning in EM concentrate on learning within what are called ‘rare events.’ An example of these studies is that conducted by Christianson, Farkas, Sutcliffe and Weick (2009) to examine the collapse of the roof of the Baltimore and Ohio Railroad Museum Roundhouse onto its collections and they found that learning that takes place through the event is important in revealing organizational weakness. These articles provide insightful analysis of OL during rare events, but their focus is limited to the learning process that takes place during the event.

Moreover, Andrew and Kendra, (2012) contend disaster responses are usually characterized by a continuous state of flux and fluidity. Thus, determining the capacity of human beings to process information is difficult at any point. Furthermore, when researchers have investigated OL in a number of crises or “rare events” as case studies, scholars have never integrated these case studies. As a result, each crisis appears idiosyncratic and managers continue to repeat the same errors when disasters occur (Lalonde, 2007).

In addition to the macro perspective that has dominated the field of EM, the prevalence of lesson learned style could be attributed to other factors. These elements can also be considered as barriers to learning in the field of EM. An important reason is that there is a difficulty in measuring learning. For example, Poole (1999) points out that knowledge creation
is difficult to measure. Even, comparing the performance of an organization between two events sometimes may not an easy task because these events vary significantly in magnitude, nature and scope. Furthermore, the vagueness of previous experience, where every disaster may present a unique incident, gives rise to imperfect lesson drawing (Moynihan, 2008).

Additionally, there is no bottom line against which organizational performance or the quality of the service can be measured for disaster related organizations. In the private sector, an increase in the profit or invention of a new product can prove an organization learned over time or has improved its performance. In short, determining whether OL has occurred or not is difficult when responding to disasters (Rudy, 2007). Emphasizing the lesson learned approach might also be a consequence of the typical emphasis of EM on response stage (Elliott & Smith, 2007).

Considering the concept of OL in EM from only one perspective (i.e. the lesson learned) can be problematic. All theories of OL have stressed feedback as an essential element for improving performance. However, Carley and Harrald (1997) examined how learning from Hurricane Hugo influenced the response of FEMA and the American Red Cross (ARC) to Hurricane Andrew. Carley and Harrald (1997) believe that disasters represent typical examples of failure to learn from feedback because of several reasons.

First, they argue that internal feedback is not given. These organizations use activity measures as substitutes for outcomes measures. For example, ARC provide effectiveness indicators in the form of how many meals were distributed and how many individuals were sheltered, but this information “does not enable learning as it does not say what needed to be
done, only what was done” (Carley & Harrald, 1997, p. 114). Second, during the initial stage when dealing with disasters, workers are often suffering from pressure, stress and sleep deprivation. Offering ‘on-the spot feedback’ in this extreme emotional state is difficult because staff are unwilling to accept feedback. Personal will see these feedbacks as negative criticisms (Carley & Harrald, 1997).

In addition, since most workforces responding to disasters are volunteers, providing a negative feedback may lead to a reduction in personnel. Third, when the initial response is over, feedback is also not welcomed because disaster related organizations are often exposed to governmental appraisal. Negative feedback is deemed to stimulate a potential risk to organizational survival (Carley & Harrald, 1997). Indeed, politics in the form of political criticisms and condemnations can inhibit the learning process (Senge, 1990; Argyris, 1985).

Benner, Mergenthaler and Rotmann (2011) identify three types of politics that arise from various sources and can influence the learning process within institutional settings. These sources include leadership, bureaucratic politics (competition among subunits) and political pressure from the external environment. Voss and Wagner (2010) examined learning process within small disasters, in particular flash floods. They found learning takes place within institutional settings that are subject to small disasters and coping with the disaster is not the central or focus of stakeholders. This finding suggests institutions may learn more when they are free from political pressures.

Carley and Harrald (1997) argue even when informative feedback is present, learning from feedback is unlikely to occur when the feedback is inconsistent with organizational
culture. For example, they indicate after the Argo Merchant oil spill in 1977, the U.S. coast guard was urged by Congress and interest groups to improve its capabilities with regard to dealing oil pollution response. However, according to Carley and Harrald (1997), the U.S. coast Guard’s senior staff recognized that this strategy required allocation of resources that would only be used for cleanup activities. In addition, the required course of action necessitates the creation of civil positions such as cleanup specialists, lawyers and accountants. This was against to the organization’s perception of itself as a military organization. Carley and Harrald (1997, p. 115) state:

*The then vice commandant of the coast guard stated to the author that he perceived that investing in lawyers, accountants, and stuff on the beach was against the long-term interests of the coast guard, even though the public support to do so was strong. In contrast, the coast guard aggressively pursued the “drug war” of the 1980s and gained a significant expansion in its base of multimission ships, boats, and aircraft. After the Exxon Valdez incident and the resulting Oil Pollution Act of 1990, the coast guard is investing in the mission-specific resources and staffs rejected in the 1970s.*

Similarly, Minear (1998) stresses the prominence of organizational culture to Learning in EM. He identifies four cultural barriers to that hinder the ability of disaster related organizations to learn. These are “their tendency to approach every crisis as unique, their action-oriented nature, their defensiveness to criticism, and their lack of accountability” (Minear, 1998, p. 1).

According to Andrew and Kendra (2012), OL that precedes disaster occurrence determines the preparedness of an organization to respond effectively to disastrous events. Therefore, examining OL in the context of EM should start with the ongoing learning process
within organizational settings. This is also in agreement with the view of social scholars who stress that the pre-existing social structures and procedures determine largely the ability of an organization to respond effectively to disasters (Schneider, 1995; Kreps, 1990).

Few EM studies have been conducted to examine the nature of the long-term learning process with regard to disaster responses. For example, Corbacioglu and Kapucu (2006) and Rudy (2007) have applied the concept of single- and double-loop learning to the response to disasters. Corbacioglu and Kapucu (2006) examined the learning process in the Turkish disaster management system through an analysis of five earthquakes (Erzincan, 1992; Dinar, 1995; Ceyhan, 1998; Marmara, 1999; Duzce, 1999). They found that only after the fourth earthquake was there a double-loop learning process that led to changes in the organizational, technical and cultural aspects of the Turkish disaster management system. An important contribution of this study is that it expands the domain of the concept of OL by applying the concepts of single-loop and double-loop to intra-organizational systems.

Rudy (2007) also examined single and double-loop learning within a single organization (Esson County Coroner's Office) and found that learning occurs in the organization formally and informally. Furthermore, single-loop learning occurred more often than double-loop learning. The contribution of this study is that it helps us to recognize that both single- and double-loop learning have the potential to improve EM. Yet, this study examined learning in only one organization.
Organizational Learning of Nonprofit Organizations

OL literature originated about 40 to 50 years from the field of business. In the last three decades, the notion of learning became highly important in the nonprofit sector because of several changes. First, there was a growth in size of some NPOs, especially non-governmental organizations that work in international humanitarian aid. These organizations relayed on methods and philosophies that originated in the field of business. Second, there was an increase in the emphasis on improving effectiveness and accountability due to shrinking budgets for many governments. Wining grants became very competitive among NPOs. Third, NPOs suffered from high staff turnover (Frerks & Hilhorst, 2002; Van Brabant, 1997).

Van Brabant (1997) thoroughly reviewed the concept of OL in the nonprofit sector and give three reasons that explain why OL is important for NPOs.

1- Improving Performance

Van Brabant (1997) argues that there will always be crucial elements that are beyond the control of NPOs and influence the effectiveness of these organizations. Yet, the negative impacts of these elements can be reduced by improving the capacities of learning because learning improves performance across different contexts. In similar vein, Edwards (1997) points out that management literature consistently document effective learning is key to improve performance because it enables staff to anticipate and prepare for threats and opportunities. In addition, learning is critical for employees’ development and effectiveness.

Learning literature in the field of nonprofit have emphasized two areas that are critical for NPOs active during disaster responses. The first area is concerning Supply Chain
Management (SCM). According to Oloruntoba and Gray (2006), humanitarian organizations generally suffer from a poor supply chain that results in increasing costs or the incapability to transport goods and poor collaboration. Scholten, Sharkey and Fynes (2010) argue the share amount of operations in humanitarian organizations and NPOs (about 80%) are SCM activities. Nevertheless, these organizations depend on standards and techniques employed in the nonprofit sector during the 1970s and 1980s. Scholten et al. (2010) maintain that NPOs ignore emergent and more developed techniques used by business organizations to confront the challenging environment.

Holguín-Veras, Jaller, Van Wassenhove, Pérez and Wachtendorf (2012) discuss the impact of the material convergence and unneeded items on the logistics of humanitarian organizations. Holguín-Veras, Pérez, Ukkusuri, Wachtendorf and Brown (2007) assert that the absence of an effective inventory control model led to significant negative costs during response to Hurricane Katrina. The main emphasis of these scholarly works is to learn new techniques to improve the performances of NPOs.

In this stream of literature, there is growing recognition that learning from business practices is one of the driving forces of developing the ability of NPOs to deliver their services in disasters. For example, McLachlin, Larson and Khan (2009) investigate the logistics issues in the Mennonite Central Committee and found managerial tools of business logistics can be adapted to NPOs. Similarly, Heaslip (2013, p. 42) states:
Similarly to humanitarian logistics service operations management involves anticipating impending disasters, trying to prevent them from occurring, mitigating their destructiveness and facilitating the humanitarian actions that are required, and completing the cycle by applying the lessons learned to improve response to future events and to minimize impact.

The second emphasized area when discussing OL in the field of nonprofit is concerning volunteer management because there has been worldwide growing acceptance that community resilience and organizational resilience are the most effective approach to EM. For example, Wachtendorf and Kendra (2004) indicate that volunteers bring benefits that cannot be met sufficiently by the resources of existing organizations. Volunteers provide immediate assistance because they close enough to affected areas and infuse flexibility in rapidly changing environments. In short, Volunteers are the backbone or the blood life of most NPOs because they are essential for effective governance and for the provision of frontline services (Waikayi, Fearon, Morris & McLaughlin, 2012).

However, unaffiliated volunteers can create danger for NPOs as well other organizations. For example, Wachtendorf and Kendra (2001, p. 9) analyze the response of 9/11 attack and state “Many volunteers were without immediately applicable skills, training, or connection to the recognized emergency management apparatus.” Thus, there is a “tendency for established emergency organizations to view volunteers and extending organizations as problems that must be managed and controlled” (Wenger, 1991, p. 12). Although this type of ‘convergence’ has been identified in a very early stage of disaster studies (Fritz & Mathewson, 1957), it remains a pressing issue for disaster related organizations (Barsky, Trainor, Torres & Aguirre, 2007; Fernandez, Barbera & Van Drop, 2006).
Thus, there has been great emphasis on learning unconventional approaches for volunteer management to encourage engagement and tackle common obstacles to volunteering (Barnes & Sharpe, 2009). The National Action Plan for the Attraction, Support and Retention of Emergency Management Volunteers that was developed by the Australian Government is an example of the emphasis on learning is clear in the key recommendations of the plan:

- Enhancing youth participation in emergency management volunteering
- Improving collection, analysis and dissemination of research information on emergency management volunteer issues; and
- Enhancing leadership training to support emergency management volunteers. (Third National Emergency Management Volunteers Summit, 2011, p. 23).

2- More Specific Purposes of Learning

Edwards (1997) who identified a number of learning goals that are important for NPOs. Most important is that policy or advocacy related learning. According to Edwards (1997), NPOs must learn from external sources for advocacy and campaigning activities that are vital for the survival of NPOs.

3- Learning and Accountability

According to Van Brabant (1997), NPOs have been blessed for a long time with loyal but rather uninformed donors. In addition, NPOs enjoyed a relatively unquestioned support from government funding agencies. As a result, NPOs were shielded from the cost of not learning. However, increasing competition among NPOs, demands from donors for transparency and results have led to strict scrutiny and more volatile relationship with donors. All in all, accountability has become a pressing issue in the nonprofit sector. As a result, NPOs that fail to
learn will hardly survive in this era because donors may leave these organizations and donate to NPOs that demonstrate continuous learning ability (Van Brabant, 1997).

4- Increasing Confidence of Governmental Agency in Nonprofit Organizations

Gibbons (2007) indicates NPOs can accomplish more when they get support from governments. However, Waugh (2000) indicates that officials are reluctant to work with NPOs during disasters because public managers lack confidence in their skills and fear legal liability for the actions they take. In addition, officials distrust the intentions and skills of the volunteers who compromise large portions of the workforces of NPOs. By learning and improving their capabilities, NPOs can tremendously increase the trust in their abilities, which in turn will help these organizations to collaborate and cooperate with other organizations and fulfil their mission more successfully.

Barriers to Organizational Learning in Nonprofit Organizations

Despite some similarities in the results between studies of OL across various sectors, some scholars believe learning in NPOs is unique and more problematic than other types of originations. For example, Edwards (1997) pointes out four characteristics that influence the nature of OL in NPOS. First, the nature of the developments undertaken by NPOs are unstable, contingent and divers because the issue they treat are caused by interrelated factors (e.g. poverty, violence and conflict issues). Beside, communities and institutions with which these organizations deal are fractured by different perceptions. In other words, there is no single ‘reality’ that when achieved NPOs can be sure that they have reached satisfactory outcomes.
NPOs have a web of stakeholders to whom they are often accountable (e.g. interest groups, donors and partners). Van Brabant (1997) asserts development work of NPOs takes place not in the material economy, but in the political economy. The political economy is feathered by power relationships which is more complex and difficult to deal with than selling merely products or services. NPOs work in a highly political environment and need to pay attentions to funders, politicians, clients and rules and regulations.

Thus, NPOs have an extremely fragile image compared with private or even public organizations (Frumkin, 2005). As a result, learning or reflection that challenge basic norms and values or the way NPOS undertake their businesses may not be possible or may sometimes lead to crisis. For example, the ARC planned to devote some of the donations received after the 9/11 attack for the families of the victims (i.e. Liberty Fund) for other relief purposes (e.g. blood reserve program). This plan was severely criticized by the donors and led to the resignations of the president and the CEO of ARC.

However, not all scholars agree about the negative effects of politics. For instance, Dekker and Hansén (2004) contend that politics may have a positive or negative impact on the learning process. When poor operations of an organization become a matter of public and political discussion leading to criticisms and objections, the organization can no longer ignore these deficiencies. Thus, politicization can result in a deep revision of chief philosophies and values. This revision often generates a double-loop learning process (Dekker & Hansén, 2004).

Second, Edwards (1997) believes, as all OL theorists, that real learning need to accommodate for error and failure. However, NPOs prefer not to do so because they tend to
provide continuously success stories in order to compete for donors and governments’ grants. This in turn, challenge the depth of self-assessment. Third, Edwards (1997) maintains that there is a conflict in NPOs between belief versus knowledge. According to him, individuals who have strong beliefs, values, loyalties and dedications to the work they perform frequently populate NPOs. Consequently, they may be driven or guided by what they believe more than what they learn.

Edwards (1997) also believes there are other factors that commonly hinder learning in these organizations including: weak reward and incentive systems, hierarchical and centralized structures, job insecurity or short term contracts make learning not a priority for staff. In addition, he insists that NPOs confuse information (raw material), knowledge (systematizing information) and wisdom (the ability to use knowledge and experience). There is too much information, but insufficient systemized knowledge. Besides, the structure by which information is disseminated to people to get what they need to do in the right time is commonly inadequate.

Similarly, Van Brabant (1997) identifies these elements as obstacles for learning, but he divides them as generic obstacles (centralization and poor information management) and structural obstacles (image, competition, financial insecurity and job insecurity). McHargue (2003) points out other factors that may influence OL in the nonprofit sector. First, spontaneous volunteers comprise a significant portion of the personnel of NPOs. However, those volunteers are often not trained and lack the necessary skills.
Furthermore, volunteers are full of emotion and their main concern is to meet the needs of the victims of the disaster. They may also have other motives such as socialization or personal benefit. Once the disaster is over, these volunteers rarely keep strong ties with NPOs and NPOs have limited control over the length of their stays. In short, volunteers’ approach to management and improvements is very different from employees’ perspective. In the initial stages of the response to disasters, an importance asset of the NPOs is spontaneous volunteers. As a result, OL may not be a concern of most ‘NPOs staff during disasters since they are not considering long-term organizational development.

Finally, McHargue (2003) stresses measurement of NPOs’ performance is inherently problematic in the nonprofit sector, which may affect the chance of becoming a learning organization because the link between learning and performance is not clear. Thus, the emphasis of NPOs is directed to securing funds rather than focusing on OL. These factors together may force OL into a background interest in NPOs.

Chapter 3 highlighted how the notion of learning has been approached in the field of EM. A major approach has been stressed in the field is “lesson learned” approach. Despite the contributions of this approach, this chapter draw attention to the risk of relaying on experiences as the sole methods for OL. In addition, this chapter identified why NPOs need to learn continually and what are the unique obstacles for learning in these types of organizations. The following chapter elaborates on the theoretical framework of this study.
CHAPTER 4
THEORETICAL FRAMEWORK

This chapter presents a comprehensive and detailed analysis of the theoretical framework used in this study to explain the postulated relationships among latent constructs investigated in this paper. Figure 2 depicts the entire concepts tested in this study.

Figure 2: Theoretical Framework

![Diagram of theoretical framework with constructs and hypotheses]

- H1 (+) from Self-Efficacy to Organizational Learning
- H2 (+) from Organizational Learning to Tendency towards Improvisation
- H3 (+) from Tendency towards Improvisation to Agility
- H4 (+) from Agility to Organizational Learning
- H5 (+) from Self-Efficacy to Agility
Organizational Learning and Self-Efficacy

Bandura (1995, p. 2) defines self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations". Bandura (1977) identified four main sources of self-efficacy: performance accomplishments, vicarious experiences, verbal persuasion and emotional arousal. A close examination of these sources will illustrate the strong relation between OL and the concept of self-efficacy. For example, performance accomplishments, which are based on personal mystery experiences, defined as past successes or failures.

In his discussion of performance accomplishments, Bandura (1977) stress that coping skills influence one’s sense of personal self-efficacy. OL can enhance individual knowledge and insights as well as changes in habits through providing individuals with knowledge and skills essential for positive change as well as addressing depression of organizational members (Gilley & Bierema, 2001). Scholars have indicated two potential outcomes of OL practices: cognitive and behavioral (Rahim, 2011; Heidmann, 2008; Lichtenstein & Lumpkin, 2005; Weatherup, 2001). An example of this impact is that found by Torkzadeh and Koufteros (1994). The authors observed that computer training course increased computer self-efficacy of 224 undergraduate students significantly.

Vicarious experiences are based on the assumption that observing peers’ performance at different tasks and the results they produce will derive the expectations of a one about himself regarding what he can do. In Europe, learning organizations tend to be active in developing innovations in-house (Organization for Economic Co-Operation and Development [OECD], 2011). Moreover, the capacity of individuals to make better decisions is improved as
the learning process is developed, because learning practices that take place in organizational context influence the frameworks (i.e. structures, policies and relationships) with which decisions are taken (Brown & Starkey, 2000). Thus, vicarious experiences are very likely to be positive on those who are working in organizations characterized by high levels of learning.

Verbal persuasion is the feedback individuals obtain from by people they respect in work settings regarding their capacity to perform effectively. In the first two sources, success increases self-efficacy and vies versa. In the third resource, encouragement or criticism may affect the level of self-efficacy. As will be recalled from the earlier discussions, dialogue and communication, openness and knowledge sharing to make informed decisions thrives in learning organizations.

Beside the emphasis on the co-operative approaches, learning organizations are characterized by a culture of high tolerance of mistakes and “accepts the positive spin-offs from errors, rather than seeks to blame and scapegoat” (Mintzberg, Ahlstrand & Lampel, 1998 in Davies & Nutley, 2000, p. 1001). As a result, individuals in learning organizations will very likely receive positive feedback, support and encouragement even when they fail to perform tasks successfully. Sources of self-efficacy clearly indicate a profound impact of OL on individuals’ self-efficacy.

Garvin (1993) maintains that learning organizations do five activities that make them are very likely to be productive, effective and to outperform unlearning organizations. These activities include systematic problem solving, experimentation with new approaches, learning from past experience, learning from the best practices of others and transferring knowledge quickly and efficiently throughout the organization. The influence of these activities on
organizational performance is well documented in literature. Therefore, workers in learning
organizations are expected to have higher levels of self-efficacy compared to those in
organizations characterized by a low level of learning.

Another viewpoint that might explain why OL is very likely to increase self-efficacy is
that related to the dominance of bureaucracies in modern life. Bandura (as cited in Kester,
2001), expresses the concern that growing bureaucracies are progressively shaped by
technologies undermine individuals’ sense of collective efficacy. This is because many people
believe that these technologies are beyond their control or even their understanding. As a
result, technologies that were, in essence, created to control our environment have come to
restrict how we think and act.

This argument is consistent with the immaturity –maturity theory developed in Argyris’s
theory postulates that formal organizations have incorrect suppositions about human nature
that hinder the proper development of individuals’ personality. For example, as humans grow
from immaturity (childhood) to maturity (adulthood), they develop from an absolute status of
passivity to be active, dependence to independence, shallow interests to deep interest, lack of
awareness to greater awareness, subordination to equality. Yet, the formal bureaucratic
organizations too often maintain workers immature by keeping them passive, dependent,
controlled and subordinated. This incongruence leads to apathetic and negative attitudes from
workers.

The belief about how much control one believes can exercise over daily tasks, influences
people’s belief about their capabilities (Bandura, 1988). Individuals with a strong feeling of
control over things they deal with are more likely to think they are capable of shaping their environments because they feel empowered, autonomous and have impacts and less constrained by the rules (Spreitzer, 1995; Amabile, 1988). Bell and Staw (1989) provide another explanation why increasing the locus of control enhance self-efficacy by building on the concept of “illusion of control” that developed by Langer (as cited in Bell & Staw, 1989). They maintain that people who have some degrees of control may come to think that they have control over the outcome.

Although formalization of organizations has become an unavoidable fact in modern life, there is clearly varying degrees in this direction. There is almost a consensus among scholars that learning organizations are far less in formalization and bureaucratization. For example, Bhatia and Mittal (2009) indicate that learning organizations are less likely to have a highly formalized and command and control structure, to perceive workers in a passive manner and to view technology as the solution for organizational problems. Moreover, there is an agreement among scholars that risk taking and acceptance of error and failures are major norms of learning organizations. Thus, many scholars consider bureaucratic and learning organization as a two ends of a continuum (see for example, Singh, 2009).

H1: Organizational learning is positively related to individuals’ self-efficacy.

Self-Efficacy and Tendency towards Improvisation

At the heart of social cognitive theory, individual are not totally the products of their environments, but they are the ‘shapers of events.’ Nonetheless, “unless people believe that they can produce desired effects and forestall undesired ones by their actions, they have little
incentive to act” (Bandura, 2000, p. 75). Furthermore, self-efficacy plays a central role in human functioning not only by influencing behavior directly, but it also has indirect impacts (Bandura, 2000; Wood & Bandura, 1989).

According to Bandura (2000), self-efficacy has impacts on other determinants such as objectives and aspirations, outcome expectations and perception of obstacles and opportunities in the environment. Moreover, it influences whether individuals think erratically or strategically, optimistically or pessimistically. Therefore, self-efficacy partially motivates and guide people’s action. Studies have found a positive relation between self-efficacy and performance at individual and group levels.

For example, White (1982) illustrates strong evidence that a main characteristic of the personality of those who achieve great success in their life is self-efficacy. Lent, Brown and Larkin (1987) examined the power of three variables that are based on different theoretical justifications (self-efficacy, interest congruence, and consequence thinking) in elucidating career-relevant behavior in students taking into consideration science and engineering fields. They found self-efficacy was the most helpful of the three in forecasting grades and persistence in technical/scientific majors. Stumpf, Brief and Hartman (1987) report self-efficacy as an important factor to cope with a difficult task.

Moreover, McDonald and Siegall (1992) examined the influence of self-efficacy on the performance and attitudes of telecommunications field service technicians whose jobs passed through main technological changes and they found that self-efficacy was positively correlated with satisfaction, commitment, and work quality and quantity. Furthermore, Gully, Incalcaterra,
Joshi, and Beaubien (2002) found the relation between team efficacy and team performance is positively significant.

Orpen (1995) examined the relation between self-efficacy among black supervisors working for white superiors in South Africa and managerial performance and found significant positive correlation with three indicators (self-rating, salary growth and average ratings of performance from three superiors). Stajkovic and Luthans (1998) conducted a meta-analysis (114 studies) to test the relation between self-efficacy and work-related performance and found they are positively associated. They claim 28% increase in performance due to self-efficacy.

However, some scholars believe the results on the links between self-efficacy and performance are mixed and not unquestionable. For example, Bell and Kozlowski (2002) argue that prior studies yielded mix findings. Besides, when a significant relationship between self-efficacy and performance was confirmed in previous studies, the relationships were relatively weak. Moreover, Chen, Casper and Cortina (2001) found positive evidences only on simple tasks, but not on complex ones. Vancouver, Thompson and Williams (2001) questioned the validity of the positive relationship indicating that even Stajkovic and Luthans (1998), who conducted the meta-analysis and aforementioned above, acknowledge that their results should be interpreted as representing the magnitude of the relationship between self-efficacy and performance and not as indicators of causal effects because the majority of studies tested in their analysis used “correlational design and the meta-analysis procedures applied were respectively concordant” (p. 245).
Vancouver et al. (2001) conducted two studies to verify the positive relationship between self-efficacy and performance. The first study involved 56 undergraduate students and used a within person, across time analysis. The findings suggested that the cross-sectional relationship was a function of past performance’s influence on self-efficacy, but self-efficacy influenced subsequent performance negatively. The second study involved 185 undergraduate students and found self-efficacy positively predicted performance. The authors conclude that the common positive relationship found typically in statistical studies might be a function of performance influence on self-efficacy not the opposite.

In another article, Vancouver and his colleagues also continued examining the relation and conducted two more studies. The first involved 87 undergraduates and self-efficacy was manipulated (by inducing high self-efficacy) for 43 of students on an analytic game. The findings indicate that the manipulation was adversely correlated to performance on the following trial. In the second study, participants (104 undergraduates) played the analytic game and reported self-efficacy between games. It was found that self-efficacy resulted in overconfidence and consequently increased the likelihood of doing errors during the games (Vancouver et al., 2002). Likewise, Stone (1994) found high levels of self-efficacy led to contribute less to tasks because overconfidence in one’s capabilities. In contrast, mild negative feedback increased the performance.

Bandura and Locke (2003) have leveled many criticisms against the studies conducted by Vancouver et al. (2001) and Vancouver et al. (2002) and emphasized these findings are misleading. First, Bandura and Locke (2003) stress that the task used (i.e. trials in the Mastermind game) created a static environment that prevented dynamic variations in self-
efficacy and performance. Second, measurements used to estimate self-efficacy were flawed because they estimated chance not beliefs of personal ability. The participants were asked in the decoding game how likely to find a solution from the first to the tenth row. Thus, these studies need to be replicated (Bandura & Locke, 2003).

Yeo and Neal (2006) examined the relation at within and between-person levels. Their key finding was that the impact of self-efficacy may change over time, but it depends on at which level of analysis (individual or group) self-efficacy is conceptualized. Similarly, Shea and Howell (2000) tested the relationship between self-efficacy and performance and found strong evidence among 148 students for a positive relationship. However, the pattern of changes in this relationship suggests that the relation “does not necessarily proceed in a monotonic, deviation-amplifying spiral” (p. 791). Mitchell, Hopper, Daniels, George-Falvy and James (1994) found evidence that self-efficacy is a good predictor of performance during early learning and skill-acquisition than later stages because the impact of self-efficacy weaken over time.

Despite these contradicting findings, it is generally accepted that self-efficacy improves organizational effectiveness because extensive empirical studies have demonstrated that self-efficacy is related to different measures of performance (Randhawa, 2007). Even scholars who questioned the validity of the positive impact that has been found in hundreds of studies, they do not discredit the value of the concept. Hawkins (1992), for example, who does not believe self-efficacy is a cause of the behavior, contends that self-efficacy is a useful concept to predict the behavior. Yet, it is worth mentioning that Bandura (1995) replied to this view and debunked the base of this assertion.
More important to this study is that self-efficacy influences how long people persevere when they encountered with obstacles; their resilience in hard times; how much anxiety and depression they feel when coping with stringent environmental conditions and how people choose among several courses of action (Bandura, 1988). People with strong self-efficacy deal with difficult tasks as a challenge to be learned and overcame not as a threat to be avoided. As Bandura (1988, p. 285) puts “people who have a strong belief in their capabilities think, feel and behave differently from those who have doubts about their capabilities. People who doubt their capabilities shy away from difficult tasks.” This negative feeling, according to Bandura, will divert the attention of individuals who have weak self-efficacy from how best to perform tasks to worry about personal deficiencies.

As a result, they surrender rapidly and are slow to recover when they are faced with struggles and adversities (Bandura, 1988). Griffin and Hesketh (2003) and Ashford and Taylor (1990) also believe individuals with high self-efficacy will be more adaptable because adaptable action will not occur if one doesn’t have the belief to perform such an act. These views are supported by empirical evidence that found low self-efficacy people experienced notably more anxiety and frustration (e.g. Bandura, 1995; Martocchio, 1994).

Similarly, Locke and Latham (1990), who developed the well-known goal setting theory, assert that self-efficacy is a key factor that influences goal-setting process by taking exactly the same view of Bandura. People with high self-efficacy tend to set higher (harder) goals. Indeed, numerous researches have indicated that self-efficacy belief strongly influence decision-making process because it significantly accelerates integration and effectual utilization of complex and ambiguous information (e.g. Curseu, 2008; Tsai & Tsai, 2003).
Brown, Ganesan and Challagalla (2001) offer excellent discussions over the influence of self-efficacy on information processing and some of these views and observations are excerpted here. Brown et al. (2001) cited many scholarly efforts that found self-efficacious individuals perform considerably better than those with low self-efficacy in “management simulations demanding complex information integration and learning of non-linear probabilities and contingencies” (p.1046). In fact, disastrous events have been stressed to exemplify the nonlinearity because the relationships between relevant variables in the system are dynamic, churning and disproportionate (Ritchie, 2004; Kiel, 1995).

Individuals with low belief in their ability interpret information in an inaccurate manner because they tend to seek information that is consistent with their sights and views. Thus, when they are confronted with ambiguous information, they will interpret it in a way consistent with their preexisting viewpoints and perceptions (Swann, 1985, 1987 as cited in Brown et al., 2001). Because their ability to tolerate uncertainty and ambiguity, many scholars indicate that individuals with high self-efficacy will be more adaptable than those with low efficacy (e.g. Gilley, 2001; Jerusalem & Schwarzer, 1992).

In organizational context, plans, structure and rules shape maps of the internal and external environments for employees. Thus, when individuals with low self-efficacy are faced with ambiguous and dynamic information, they will tend to go back to plans, structures and policies that shaped their views. In contrast, self–efficacious will give less emphasis to these elements and act upon the needs of the situation. This, in turn, may require improvising new actions to meet the demand of the environment they are faced with.
The above discussion provides explanations of the deep roots of the positive relationship that has been found between self-efficacy and risk-taking behavior by many researchers. Slanger and Rudestam (1997), for example, reported self-efficacy as a key determinant of behavior of athletes in high-risk sports. Llewellyn, Sanchez, Asghar and Jones (2008) observe risky indoor and outdoor climbing are linked to high self-efficacy. Moreover, Hill, Smith and Mann (1987) conducted a study 27 years ago when computers were seen a new invention. They found computer self-efficacy beliefs influenced whether undergraduate students chose to use computers regardless of their beliefs regarding the value of using computers. One of the inherent features of improvisation is that it goes hand in hand with risk taking aptitude. Thus, self-efficacious individuals are very likely will have tendencies toward high levels of improvisation.

The ability to improvise has been linked also to creativity by almost all emergency officials. For example, Kendra and Wachtendorf (2002) examined creativity in emergency response after the World Trade Center attack and argued that “planning and creativity work in concert to produce effective improvisation” (p. 5). This because planning establish the foundation for the decision-making process by anticipating challenging in the surrounding environment, but these plans cannot anticipated all the needed actions and organizations must improvise because of the very nature of disastrous events. As a result, creativity in preparedness efforts will improve improvisational actions during disasters.

Many scholars assert that individuals feel self-efficacious are likely to be innovative. For example, Özaralli (2003) and Spreitzer (1995) maintain that self-efficacious are likely to be innovative because they feel empowered. Bandura (1997) emphasizes that self-efficacy is an
important prerequisite for discovering new knowledge and creative productivity because it shapes the motivation, individual’s behavior as well as his choice of tasks. Bandura (1997) states:

“Innovativeness requires an unshakable sense of efficacy to persist in creative endeavors when they demand prolonged investment of time and effort, progress is discouragingly slow, the outcome is highly uncertain, and creations are socially devalued when they are too incongruent with pre-existing ways.” (Bandura, 1997, p. 239).

Studies also have found a positive relation between self-efficacy and creativity. For example, Redmond, Mumford and Teach (1993) examined empirically leaders’ behavior on subordinate creativity and found behavior contributing to feelings of self-efficacy resulted in higher levels of subordinate creativity. Tierney and Farmer (2004; 2002) found that “creative self-efficacy” notably predicted supervisors’ scores of employees’ creativity in manufacturing and operation departments. In the second study, they found the efficacy level affects the extent to which 140 R&D workers entertain, initiate and sustain creative actions and behavior in their work. Improvisation is seen by many scholars as a form of innovation (see for example, Eisenhardt & Tabrizi, 1995). Together, these views suggest self-efficacious individuals will tend to improvise more than those with low self-efficacy.

The link between self –efficacy and the ability of one’s ability to improvise is well articulated in the statement of Bandura (1982, p. 122):

_Efficacy in dealing with one’s environment is not a fixed act or simply a matter of knowing what to do. Rather, it involves a generative capability in which_
component cognitive, social, and behavioral skills must be organized into integrated courses of action to serve innumerable purposes. A capability is only as good as its execution. Operative competence requires orchestration and continuous improvisation of multiple subskills to manage ever-changing circumstances. Initiation and regulation of transactions with the environment are therefore partly governed by judgments of operative capabilities.

Finally, Bandura (1977) stresses that when improved self-efficacy is created, it tends to generalize to other circumstances that can be substantially different. There is an important implication of this assertion when studying the concept in the context of EM. Enhanced self-efficacy that established during non-emergency situations will be transferred to emergency times and across various types of disasters. Thus, managers in NPOs can use it as a key indicator of how individuals are cognitively prepared to respond to disasters.

H2: individuals’ self-efficacy is positively related with their tendency to improvise.

Organizational Learning and Tendency towards Improvisation

Senge (2006, p. 2) states that productive OL occurs in

organizations 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.

In addition, this “can only be achieved by breaking with the traditional authoritarian, command and control hierarchy.” (Senge, 1992, p. 31). This environment is ideal for improvisation, which “involves exploring, continual experimenting, tinkering with possibilities without knowing where one’s queries will lead or how action will unfold” (Barrett, 1998, p.606).

Empirical studies have also found links between OL and improvisation. For example, Miner et al. (2001) examined improvisation in product development activities in two
organizations and found links between improvisation and long-term OL. Improvisation is influenced by shared norms and practices and organizational memory as “learned ways of thinking and behaving” (Moorman & Miner, 1998). Scholars perceive improvisation as to be closely linked to the domain of OL because of many reasons.

First, Crossan and Sorrenti (2002), contend that improvisation is a facet of OL along other aspects, such as planning and visioning. This because OL is compromised, according to them, of intuitive and spontaneous aspects that are essential for the establishment of new insights and the institutionalization of these insights into the system, structure and procedures. Improvisation is the necessary spontaneous element of knowledge creation. As Weick (1998, p. 551) states it, “improvisation is a mixture of the pre composed and the spontaneous.”

Second, improvisation requires taking risk, which, in turn, necessitates tolerance for mistakes. This may involve experimenting or devoting resources for uncertain return (Schimmel & Muntslag, 2009). While organizations characterized by low levels of learning make individual risk-averse, OL introduces uncertainty by embracing new patterns of developments. Supportive and collaborative environment, experimenting and trying new approaches and tolerance for mistake and openness are prominent norms of learning organizations. Therefore, individuals in learning organizations are more likely to approach improvisational actions than those in unlearning ones.

Third, OL enhances creativity, innovation and imagination (Kim & Wilemon, 2007). Feeney (2001) argues that brilliance in behavior performance indicates innovation and improvisation. Furthermore, Zheng, Venters and Cornford (2011) contend that improvisation can be linked to innovation because it fills the gap between reality and possibility by inducing
actions that are partially planned yet extensively emergent and spontaneous. Similarly, Denhardt and Denhardt (2006) stresses that organizational innovation has an obviously improvisational aspect.

The underlying assumptions behind these claims is that theory rarely allows forecasting accurately about the consequences of alternatives and the innovator must improvise to create his novel solution. For example, a manufacturer often has to improvise for many years in order to install a new production process (Norman, 1992). Scott, Leritz and Mumford (2004) conducted a quantitative meta-analysis based on 70 studies and found that presence of OL aspects is linked to the increase in creativity in organizational settings.

However, many scholars are conservative about the existence of any link between improvisation and innovation (Samli, 2007). Creativity may not be a present feature in all improvisational acts indicating that there may be no link between creativity and improvisation (Moorman & Miner, 1998). Moreover, some believe improvisation can be achieved by controlling and planning (Høyrup, 2012).

H3: Organizational learning is positively related to individuals’ tendency to improvise

Organizational Learning and Agility

The concept of “agility” was created essentially in the business sector because this sector is continually facing a turbulent environment. As Hugo states “most profitable opportunities in the global economy are, by definition, short-term opportunities. Companies need to respond and act quickie on opportunities that arise” (as cited in Davis, Boswell & Frechette (2010, p. 43). Recently, the concept gained momentum in various disciplines and
agility became a prominent principle of EM and one of the hallmarks of successive organizations that experience turbulent and stressful environments (Fagel, 2011).

Agility has been defined in various ways. For example, it has been defined as “the ability of an organization to thrive in a continuously changing, unpredictable business environment” (Agility-Forum, 1994 as cited in Prater, Biehl & Smith, 2001). Jamrog et al. (2006, p. 5) define agility as “moving quickly, decisively, and effectively in anticipating, initiating and taking advantage of change.” But in general, agility denotes how productive capabilities can be integrated through knowledge and skill development and promoting innovative thinking (Aitken, Christopher & Towill, 2002).

Agility literature in EM has stressed reoccurring themes, including: flexibility, control and bureaucratization (see for example, Webb & Chevreau, 2006). The role of flexibility in emergency response has been well stressed by almost all scholars of the field (see for example McEntire, 2014; Waugh & Streib, 2006; Kendra & Wachtendorf, 2003; Quarantelli, 1999; Neal & Phillips, 1995; Dynes, 1990). These scholars to increase organizational flexibility have provided many recommendations.

First, scholars have urged officials not to emphasize the command and control style of management. The majority of scholars in the field believe that it is often impossible to respond to disasters effectively through hierarchical and top-down relationships. Second, research warned of bureaucratization and emphasizing routines. For example, centralization and bureaucratization were thought to be the major reason for the extreme failure of emergency response in the aftermath of Hurricane Katrina (see for example Bier, 2006; Schneider, 2005).
Volberda (1999) pointed out flexibility is occasionally related to changes in routines. Consequently, organizations that emphasize routines will be less flexible compared to organizations that place less emphasis on routines. Organizations in which learning practices prosper place far less emphasis on control, routines and bureaucratization. Learning organizations, as discussed above, are characterized by the openness, cooperation and participation and sharing of power. Instead of bureaucratization, a key norm of these organizations is risk taking. Confrontation, conflict and the challenging of ideas is accepted and appreciated. Therefore, learning organizations will be more agile than organizations with lower learning capacities.

Many authors who believe OL can be a primary source of organizational agility in turbulent environments (e.g. Wilton, 2013; Cunningham et al. 2000) have stressed the theoretical relationship between OL and agility. Yusuf, Sarhadi and Gunasekaran (1999) identify education and team building as key attributes and practices of agile organizations. Practices related to education include learning organization, multi-skilled and flexible people, workforce skill upgrade and continuous training and development. Elements related to team building include empowered individuals working in teams, cross-functional teams and across company borders, teams and decentralized decision-making.

In addition, Dyer and Shafer (2003) contend that learning behavior is an essential feature of workforce’s behavior to achieve an agile organization because the two concepts are similar to each other. Both concepts pursue new organizational paradigm where adaptation is not a one-time or even periodic event, but a continuous process. Dyer and Shafer (2003) review lessons from research on organizational agility and asserts that reading the market, embedding OL and mobilizing rapid response are the recipe for agile organizations.
Moreover, Jackson and Johansson (2003) maintain that agility capabilities can be classified into four key dimensions: (1) product-related change competences; (2) change competency within processes; (3) internal and external cooperation; (4) people, knowledge, and creativity. Additionally, Sumukadas and Sawhney (2004) believe that power sharing has a great impact on workforce agility. Matching these characteristics, capabilities and factors mentioned in discussion on OL clearly shows that agility is very likely to be high in organizations more oriented toward learning. Hays (2004) indicates Wal-Mart as an example of an agile business during a hurricane season in Florida because its knowledge management competencies.

Furthermore, indicators of the workforce agility defined by scholars reflect the significant impact of OL on the agility of organizational members. For example, Plonka (1997) (as cited in Sherehiy, Karwowski & Layer, 2007) contends that attitude toward learning and self-development; problem-solving ability; being comfortable with change, new ideas and technologies; the ability to generate innovative ideas and accepting new responsibilities are the indicators of workforce agility. Sherehiy et al. (2007) believe that agile employees have a high tolerance for ambiguity and need only a short time to recover from adversity or disappointment.

The Economist Intelligence Unit (EIU) conducted a survey of 349 CEOs around the world to investigate the critical traits of agile businesses and the findings of this study clearly indicate strong relation between organizational agility and learning practices. For example, one of the four major findings in this report is that internal barriers, such as risk-averse cultures, silo-based information and low decision-making and stall organizational agility. Flexible management of
teams and human resource and decentralized flat structure were seen as critical traits of agile organizations (EIU, 2009). The findings of this study are shown in Figure 3.

Figure 3: Critical Traits of Agile Businesses.

<table>
<thead>
<tr>
<th>What are the critical traits of an agile business? Select up to three. (% respondents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid decision-making and execution</td>
</tr>
<tr>
<td>A high-performance culture</td>
</tr>
<tr>
<td>The ability to access the right information at the right time</td>
</tr>
<tr>
<td>Accountability and credibility</td>
</tr>
<tr>
<td>Flexible management of teams and human resources</td>
</tr>
<tr>
<td>Decentralised or “flat” management reporting structure</td>
</tr>
<tr>
<td>Lean operations</td>
</tr>
<tr>
<td>Continual process improvements/Six Sigma</td>
</tr>
<tr>
<td>Unified/flexible application infrastructure</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

Sources: Adopted from (EIU, 2009, p. 9).

Based on these viewpoints, individuals in learning organizations are expected to be more agile than those in organizations with low learning capacities.

H4: Organizational learning is positively related to individuals’ agility in NPOs.

Agility and Tendency towards Improvisation

The concept of agility has a close meaning to improvisation. Indeed, some scholars treat both concepts as the same because they consider them as the opposite of another concept, i.e. discipline. However, agility is broader than improvisation. While improvisations are one shot actions and the concept is mainly concerned with responding to unforeseeable situations, agility is concerned with the way the organization lives over the long run whether for seeable or unforeseeable businesses. For example, Clark (2010) interviewed more than 300 managers at all levels of organizations and asked them to define agility. The answers of these managers fell
into three categories intellectual, emotional and physical agility and these features give clear
differences between agility and improvisation.

Scholars have different inputs on why agility is important for EM. Rao, Eisenberg and
Schmitt (2007) emphasizes the crucial role of agility in disasters because there is no an ideal
form of organization or group of organizations is always well-matched for the variety of issues
that arise. Moreover, Kloeber (2009) argues that current research on management under
extreme circumstances confirms that learning agility is the most vital element of success
because it enables people to perform effectively and rapidly decide and act under such
conditions. In other words, organization’s agility implies the ability of an organization to identify
its relative position in a specific setting (Singh, Sharma, Hill & Schnackenberg, 2013).

Recently, agility has been identified as one of critical success factors in the context of
humanitarian aid, in particular concerning supply chains (Pettit & Beresford, 2009). This is
because the success of any humanitarian operation is directly credited to the effectiveness in
getting the crucial people and needed supplies to the right place quickly (Overstreet, Hall,
Hanna & Rainer, 2011). For example, scholars of logistics stress applying the concept of agility
goes beyond the notion of competitiveness that is stressed in the business field to saving the
lives of thousands of people (Cozzolino, Rossi & Conforti, 2012).

More important to this dissertation is that most scholars have defined agility as a key
element for determining the ability to improvise in volatile environments. For example,
Heemsbergen (2004) stresses that one of the crucial competencies that is necessary for
improvisation is quickness and agility. Moreover, Davis et al. (2010) insist that when agility is
high, members of the organization are ready to improvise. Furthermore, Biscop and Renard
(2013) stress agility as a key quality that is required for a sudden and rapid response and improvisation in crises.

There are several reasons that can explain why agile organizations are very likely to boost the improvisational tendency of workers in organizational settings. First, organizational agility has been stressed as a major source for making organizations are open to change because agile organizations are not controlled by conformance to planes, boundaries and simple rules, but to organizations’ priorities and values (Highsmith, 2002). So, when the environment of the organization or its goals changes, it makes the necessary changes accordingly (Lankhorst, 2012).

Likewise, Anderson et al. (2009) argue that agility is critical to enable organizations to change easily and responsively as it combines flexibility and speediness. Improvisation can be seen as a form of organizational changes because improvisational actions inevitably involve one or more forms of deviation from persisting norms, procedures and plans. Thus, individuals in agile organizations will tend to recognize improvisational behavior as a natural component of their jobs and improvisational climate will be constantly present in their organizational contexts. Sutcliffe and Vogus, 2003 (as cited in Ancona, 2012, p. 11) indicate that people in agile organizations have a high tendency to think of improvisation because these organizations are not bogged down in blaming or thinking about what might have been.

Literature on sense-making and improvisation stress sense-making is a core component of individual and organizational improvisations (Garreau & Adrot, 2009). Weick, Sutcliffe and Obstfeld (2005) reviewed sense-making studies and conclude that the concept of sense-making is useful for organizational milieu because it provides ground for improvisation. Sense-making
significantly impacts the ability to make sense of clues in the context in order to develop new acts to meet the needs of unique situations an individual or a group have to face (Garreau & Adrot, 2009; McDaniel, 2007; Weick 1993).

Agile organizations are very likely to promote improvisational tendency among individuals because they enhance “sense-making” skills, environmental scanning and management of ambiguity and uncertainty through using scenarios to scan (McCann, Selsky & Lee, 2009; Evans, 1991), being flexible in moving across ideas and positions without enormous difficulty (Mauk & Metz, 2013; DeRue, Ashford & Myers, 2012) and skills assessment and development (Sharifi & Zhang, 1999). As a result, people continually attempt to make sense of their environment in order to find solutions to problems as they appear.

Concomitant with developing sense-making skills, agile organizations increase the flexibility of the decision making process through avoiding paralysis in decision making (McCann et al, 2009); acquiring flexible resources and fostering flexibility in coordinating diverse types of resources (Doz & Kosonen; 2010; Sarker & Sarker, 2009; Sanchez, 1995); initiating new strategies (Volberda, 1996); using contingent work to cope with environmental turbulences (Matusik & Hill, 1998).

Organizations that encourage making fast decisions are often have high acceptance for improvisational decisions (Mendonça, 2007; Weick & Sutcliffe, 2001; Orlikowski & Baroudi, 1991). Consequently, individuals in agile organization are expected to have greater flexibility and tend to improvise more than those in slow organizations when responding to crisis.

H5: Individuals’ agility is positively related to individuals’ tendency to improvise.
This chapter presented an analysis of the theoretical framework and the hypothesis examined in this study. The following chapter explains the research design and methodology of this study.
CHAPTER 5
RESEARCH DESIGN AND METHODOLOGY

This chapter elaborates on the selected research structure for this research and methodology will follow from this structure. The next section presents the research design used in the study. The following part describes the geographical and religious background of the research site. Then, EM issues and problems that encounter these locations are discussed. After that, a description of the population of this study is outlined. This part identifies the criteria based on which organizations were selected in this paper.

The chapter also elaborates on measurements and survey instrument by addressing the theoretical justifications for the measurements of each latent construct. Finally, this chapter gives an overview of the statistical technique (i.e. SEM) used in this study including its strengths and limitations. In addition, the concept of goodness of fit and measures used to assess this concept are provided.

Research Design

A descriptive, ex post facto cross sectional research design is used in this study. The reason for selecting this research design is that ex post facto research designs is the most appropriate research design of social research when it is not practical or not possible to control the dependent variable because the phenomena takes place in the context naturally (Silva, 2010). OL is a phenomenon that occurs naturally in any context and controlling it is extremely hard if not possible.
Cross sectional research design provides practical advantages for the researcher. First, cross-sectional research design indicates the collection of data is a time-bounded (Rose, Spinks & Canhoto, 2014). Beside, cross sectional studies are often non-expensive and relatively simple (Salkind, 2010). This is entirely important for a dissertation that needs to be completed within a certain time and cannot be extended. Second, cross-section studies are not geographically bound as the case of observational research. This also brings a practical benefit for this study because it is conducted in three different cities in Saudi Arabia: Makkah, Jeddah and Medina.

However, it is important to underline that selecting this type of research design can bring some weakness to the finding of this study. The ability of establishing cause and effect relationships in cross sectional studies is frequently criticized because their weak capability to establish causation. Cross sectional studies are retrospective in their nature and can not give an indication of the time sequence of events. Using the descriptive ex post facto cross sectional research design gives a 'snapshot' of statistical associations between variables at a particular point in time.

Scholars stress that since the results obtained in this type of research represent one point at a time, there is always a chance to get different findings if a different time-frame research structure had been chosen. Beside, cross sectional studies are also being known for its low capacity to evaluate “confounding errors” such as cultural elements and selection bias and social interaction (Silva, 2010, p. 467). Finally, it is hard to match groups with one another in cross sectional research because “unlike a longitudinal design, participants do not act as their own controls” (Salkind, 2010, p.314).
Despite these limitations, cross section research is the most common research design used in social to study the attitudes and behaviors of individuals. The following section will highlight the site of the study from geographical perspectives. In addition, EM related topics such as natural disasters and crowd management are discussed.

Study Site

This study is conducted in three cities in Saudi Arabia: Makkah, Jeddah and Medina. These cities are located in the western area of Saudi Arabia. The western area of Saudi Arabia has a commercial and religious importance. From a commercial viewpoint, Jeddah is the second largest city in SA; it is considered the commercial city and it has the biggest harbor on the Red Sea. In the last census, Jeddah had a population of 3.5 million and the total population of KSA was 27.1 million (Bifari, Kosaki & Ishikawa, 2011). The City of Jeddah is located 80 km from Makkah. It is bounded from the south and the east by mountains and from the west by the Red Sea and is considered the main crossing point for pilgrims to Makkah.

From the religious perspective, Makkah and Madinah are the holy cities for all Muslims across the world. Every Muslim, who has financial and health abilities, has to perform Hajj, which is the fifth pillar of Islam, one time in life. Although poor, sick and poor people are not required to do Hajj, some of them come and endanger their lives. Many of these pilgrims come without sufficient food and expenses and even shelters. Many pilgrims also come when they are at very old ages because they could not afford to get at younger ages or because the annual lot had not chosen them until they got old (every Islamic country allowed 1 % of its population every year).
Therefore, every year millions of Muslims come annually at certain a time and stay for about week to perform Hajj resulting in a massive occasion. Furthermore, when Muslims perform Hajj some of them extend their visits to three months. The reasons for that vary from the desire to spend longer times in holy sites to benefit from food and free service provided in the holy sites for Muslim. The latter is a real incentive for those come from very poor countries. Muslims also visit Makkah at any time of the year for Umrah, which is the lesser pilgrimage. Although Umrah is not an obligatory to perform, it is highly recommended once in life and majority of Muslim do it. In the last census, Makkah had a population of 2 million. Figure 4 illustrates the locations of the cities on the map.

Figure 4: Research Site


Medina is located about 400 km for Makkah and it was the first capital for the Islamic state. Although visiting Madinah is not an obligatory, almost all Muslim visit the city, because it has the mosque of profit Mohammad that is the second holy Mosque for Muslims after the holy
mosque in Makkah, which millions of Muslims visit every year. The mosque also embrace the shrine of Prophet Mohammad. In the last census, Makkah had a population of one million.

1- Crowd Management

During the pilgrimage, crowds piling up during a short period. Moreover, these cities are visited by over 10 million pilgrims every year, which expose infrastructure and service providers to huge pressures. This in turn, creates difficulties for visitors. These difficulties range from creating uncomfortable long waiting periods to access certain points in the holy cities to extreme danger such life-threatening situations. For example, week and sick people can lose their life because of stumbling during overcrowding when pilgrims perform their duties.

Although the government provides many services, such as medical services, not all pilgrims’ needs are officially offered. Even when the government offers the type of service, pilgrims need logistic help to benefit from these services such as translation, guidance and other complementary helps. During Hajj and Umrah times, pilgrims need various kinds of support and help, such as provision of meals for needy pilgrims. In addition, assistance for pilgrims and visitors affected by various incidents, including traffic accidents, health diseases, loss of money and loss of family members. NPOs in Makkah and Medina play a key role in providing these services. Yet, the needs of those pilgrims exceed the capacities of NPOs creating an emergency environment around the year.

2- Natural Hazards in West Province.

In the last five years, three major devastating floods have hit the west province of Saudi Arabia. The Jeddah flood occurred in 2009 caused extensive disruption to the city of Jeddah, its
infrastructure, social capital and the political system. The city was exposed to heavy rain that escalated into a devastating flood that caused the deaths of 161 people and estimated damage of one billion dollars. Two overwhelming floods in 2010 and 2011 also followed the flood of 2009. Makkah also was exposed to floods in 2013 that caused momentary losses.

Medina also was exposed to a series of unusual type of earthquake that lasted for two weeks in 2009. According to Saudi and US scientists, this earthquake was triggered by failed volcanic eruptions (Al Amoudy, 2010). Although the earthquake was not devastating and the center of the earthquake was outside the city, it led to evacuate small villages that was close the center of the earthquake.

Study Population

A sample of NPOs in these three cities are randomly selected. The unit of the analysis will be individuals in NPOs. There are two major criteria for organizations included in this study. First, the organization must be considered as an official nonprofit organization. Second, the organization must have disaster-related activities. NPOs, for example, that are related to art activities and are not active in disasters are not included in this study. This is because the focus of this study is to comprehend how the variance in the level of OL in NPOs’ influences individuals’ self-efficacy, agility and their tendency to improvise during disasters.

The study sample consists of 13 organizations. Five organizations were from the city of Jeddah, four from the city of Makkah and four from the city of Madinah. A brief description if the activities provided by these organizations are outlined in Table 3.
Table 3: A Brief Description of the Study Population

<table>
<thead>
<tr>
<th>Location of NPOs</th>
<th>Organization code</th>
<th>Brief description of organization’s activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jeddah</strong></td>
<td>NPO1</td>
<td>Distribution of donations in cash and kind to needy people around the year and response to disasters and crises.</td>
</tr>
<tr>
<td></td>
<td>NPO2</td>
<td>Response to disasters (locally and internationally) and conflicts issues by providing medical and human aids.</td>
</tr>
<tr>
<td></td>
<td>NPO3</td>
<td>Provision of medical treatment by working and negotiating private hospitals.</td>
</tr>
<tr>
<td></td>
<td>NPO4</td>
<td>Provide primary medical courses, such as First Aid, CPR. Help to transport injuries in accidents.</td>
</tr>
<tr>
<td></td>
<td>NPO5</td>
<td>Support poor families and reduce poverty.</td>
</tr>
<tr>
<td><strong>Makkah</strong></td>
<td>NPO6</td>
<td>Providing and managing shelters and offering places around the Grand Mosque to take care of children while their parents perform the rituals.</td>
</tr>
<tr>
<td></td>
<td>NPO7</td>
<td>Offering charitable services such as providing food and clothing.</td>
</tr>
<tr>
<td></td>
<td>NPO8</td>
<td>Offering elderly people related services such as health and psychological care.</td>
</tr>
<tr>
<td></td>
<td>NPO9</td>
<td>Providing guidance for loser people, coordinating services for pilgrims with different branches of the government and accessories that help to perform the Hajj and Umrah (e.g. umbrellas, snakes, flyers).</td>
</tr>
<tr>
<td><strong>Madinah</strong></td>
<td>NPO10</td>
<td>Disasters relief and building sustainable communities locally and internationally.</td>
</tr>
<tr>
<td></td>
<td>NPO11</td>
<td>Support poor families and reduce poverty.</td>
</tr>
<tr>
<td></td>
<td>NPO12</td>
<td>Providing medical services.</td>
</tr>
<tr>
<td></td>
<td>NPO13</td>
<td>Building strong family relationships and reduce poverty.</td>
</tr>
</tbody>
</table>

Data Collection

The data was collected through a self-administered questionnaire distributed to employees in NPOs by the researcher. The researcher first met the head of identified organizations and requested their approval. Once the approval was obtained, surveys were distributed to the employees. The researcher then provided each organization with a locked
box to return the surveys after completion. The action was thought to be important because anonymous response can reduce the effect of the social desirability issue (Mitchell & Jolley, 2012). Yet, the authorities in four organizations asked the researcher to collect surveys by organizations themselves.

A total of 651 surveys were distributed by the researcher to these organizations with a consent letter asking for completion of these surveys. Table 4 shows the number of surveys were distributed to each organization and the number of returned surveys.

Table 4: The Number of Distributed and Returned Surveys

<table>
<thead>
<tr>
<th>Organization code</th>
<th>Number of surveys distributed</th>
<th>Returned surveys</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPO1</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>NPO2</td>
<td>57</td>
<td>25</td>
</tr>
<tr>
<td>NPO3</td>
<td>68</td>
<td>28</td>
</tr>
<tr>
<td>NPO4</td>
<td>47</td>
<td>15</td>
</tr>
<tr>
<td>NPO5</td>
<td>56</td>
<td>29</td>
</tr>
<tr>
<td>NPO6</td>
<td>73</td>
<td>28</td>
</tr>
<tr>
<td>NPO7</td>
<td>40</td>
<td>16</td>
</tr>
<tr>
<td>NPO8</td>
<td>96</td>
<td>58</td>
</tr>
<tr>
<td>NPO9</td>
<td>45</td>
<td>20</td>
</tr>
<tr>
<td>NPO10</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>NPO11</td>
<td>30</td>
<td>18</td>
</tr>
<tr>
<td>NPO12</td>
<td>42</td>
<td>17</td>
</tr>
<tr>
<td>NPO13</td>
<td>47</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>651</td>
<td>304</td>
</tr>
</tbody>
</table>

To facilitate question filling and to increase the response rate after the initial delivery of surveys, I called organizations to complete the surveys and explained the contribution of this research to the third sector. Of 651 questionnaires, 304 were completed and returned. Therefore, the response rate was 46.6%. Measurements and Survey Instrument. Appendix A illustrates the survey instrument and consent letter. Indicators for each of the latent constructs
are called “Measurements.” This section addresses the theoretical justifications of the measurements of each latent construct. When discussing the measurements of each construct, the terms measurement, indicator, manifest and factor will be used interchangeably hereafter.

1- Organizational Learning

Defining and measuring OL has been “excruciatingly hard to do” due to the lack of theoretical agreement on what meant by the notion (Arthur & Aiman-Smith, 2002. p, 739). Fiol and Lyles (1958. p, 811) contend that despite the development of the field, there was “considerable inconstancy in what is being observed and how it is being measured” and the conceptual confusion still persists. Other scholars argue even when there is an agreement on what to be measured, achieving this goal is sometimes extremely hard, if not impossible. Argote (2012), for example, indicates that measuring change in knowledge that is acquired through learning practices is virtually impossible in a business hiring thousands of workers.

Despite this dilemma, a major breakthrough in operationalizing the concept of OL was made by Marsick and Watkins (2003) who developed the Dimensions of Learning Organizations Questionnaire (DLOQ). DLOQ has been employed in over 70 published studied and translated into at least 14 languages. It aims to measure changes in OL practices and culture to evaluate elements that influence the overall adaptiveness of organizations (Marsick, 2013). Since 2002, Watkins and Marsick have documented 173 requests to use the DLOQ in research in 38 countries including the US, Europe, Africa and the Middle East, and Asia (Marsick, 2013).

Using such a measurement tool has two main features. First, DLOQ has been widely examined for validity and reliability and proved to be valid and reliable (Song et al., 2013; Yang,
Watkins & Marsick, 2004). For example, the validity and reliability of the DLOQ was examined in Korean and Turkish contexts and the DLOQ has yielded reliable measurement scores with an acceptable construct validity to measure OL (Song, Joo & Chermack, 2009; Basim, Sesen & Korkmazyurek, 2007). Second, DLOQ appears to be the measurement tool that has gained extensive agreement among the researchers in the field because it incorporates dimensions from various perspectives that are thought crucial for measuring the concept (Marsick, 2013). The DLOQ has been tested with numerous interdisciplinary variables to demonstrate the positive influence of OL on different performance measures (Song et al., 2013).

Bess, Perkins and McCown (2010) developed and tailored measures of OL capacity in NPOs that were selected based on items adopted from DLOQ. Bess et al. (2010) contend that the measures used concentrate on facets of OL that are prerequisites for learning and relevant to community-based nonprofits. The measures adopted fall into two themes that constitute, according to their view, the main two components of OL capacity. The first component is organizational systems alignment, which emphasizes the role of leaders in creating OL and refers to enduring systems and procedures within the organization that permit individuals to respond efficiently to challenges and prospects in internal and external environments.

The second element is culture of learning and development, which refers to practices that value open communication, learning, workforce empowerment and development. The cultural side emphasizes the importance of establishing a situation in which investigation, learning, involvement, and openness is appreciated and that these ideals are expressed in organizational habits, procedures, conventions, traditions and customs. This study adopts the same measurements used by these scholars because they largely illustrate to what extent
learning capacities or capabilities do exist in NPOs. Furthermore, indicators are based on a strong theoretical foundation that has gained extensive acceptance in the field of OL. These measurements can be found in section 2 of Appendix A.

2- Self-Efficacy

Two major approaches have been identified in studies attempting to measure the concept of self-efficacy. The first approach is where self-efficacy is considered as a generalized concept. Studies within this stream of literature use General Self-Efficacy Scales (GSEs) (e.g. Chen, Gully & Eden, 2001; Judge, Locke, Durham & Kluger, 1998; Schwarzer & Jerusalem, 1995; Sherer & Adams, 1983; Sherer et al., 1982). The second approach recognizes the concept of self-efficacy as not a global trait. Instead, it is a ‘differentiated set of self-beliefs linked to distinct realms of functioning’ (Bandura, 2006, p. 307). In other words, self-efficacy is a domain or task specific.

Despite the extensive use of GSEs, this dissertation adheres to the second approach for two main reasons. First, Bandura (2006) pointed out that the “one measure fits all” approach frequently has weak explanatory and predictive value because the relevance of the majority of the metrics in all-purpose measure to the domain of interest is usually little or does not exist. This assertion was supported by a number of studies that attempt to examine the predictive validity of GSEs and domain specific scales and found the latter more robust than the former (e.g. Earley & Lituchy, 1991; Bandura, 1990, 989).

Another reason is that GSEs are often characterized by ambiguity about precisely what is being assessed or the level of the task (Bandura, 2006). This is because these scales usually
use measures are unconnected with the object of interest and casted in general terms in an attempt to serve all purposes. Stajkovic and Luthans (1998) maintain that decontextualizing the concept render them to be abstract beliefs and, thus, incompatible with the assumptions of the social cognitive theory. Bandura (2006) concludes that scales of perceived self-efficacy must be tailored to match the needs of the domain of the study by measuring challenges or impediments to successful performance.

Several recommendations of how to measure self-efficacy were proposed by Bandura (2006) have been followed in this study. First, the items should be phrased in terms of “can do” rather than “will do” because perceived efficacy is a judgment of capability not intention. Second, the strength of their efficacy beliefs on a scale, ranging from (”Cannot do”) through intermediate degrees of assurance (”Moderately certain can do”) to complete assurance (”Highly certain can do”). Third, to encourage forthright answers, Bandura maintains the scale should be labeled by using a nondescript title such as “Appraisal Inventory.” Based on reviewing various nonprofit and EM literature, this study developed a scale that is related to critical tasks that individuals working with NPOs often encounter during emergency times. These measurements can be fined in section 3 of Appendix A.

3- Agility

Generally, measuring the concept of agility is a daunting task (Chyan & Liu, 2012) because its metrics are difficult to identify owing to the multidimensionality and vagueness of the concept (Tsourveloudis & Valavanis, 2002). Scholars have developed different metrics to measure agility. For example, Dove (1994) suggests that enterprise agility to be assessed in
term of cost; time; quality and scope. Shen and Ju (2007) maintain return on investment, productivity, quality, adaptability and innovation are the appropriate measures of agility. Yet, the common denominator of most of these efforts is the integration of organization, people and technology into a coordinated system that respond rapidly to changes (Leondes, 2010).

Since the mission of NPOs is often not profitability and these organizations usually do not manufacture market products, applying these criteria used in the private sector is a problematic. Recently the concept of agility has been transferred to NPOs with emphasis on SCM and how quick the deployment in emergencies. Scholars emphasize business concepts when assessing the agility of these organizations such as technology, lean inventory, efficiency, effectiveness and networking (see for example, Scholten et al., 2010; Oloruntoba & Gray, 2006; Van Wassenhove, 2006). The aim of these theoretical frameworks is to reduce the time of material mobilization during times of emergencies.

Since this study focuses on workforce agility, metrics will be built here on prior studies on agility of human resources in organizational context. Breu, Hemingway, Strathern and Bridger (2002) conducted research to identify the attributes of an agile workforce. The analysis of the data that was composed of 515 U.K. senior managers from UK private and public sector organizations illustrates ten key traits of an agile workforce. These characteristics were clustered into five broad capabilities, which are (1) intelligence (2) competencies (3) Collaboration (4) Culture (5) information systems (IS). A distinctive feature of this research is that it was focusing on non-production workers that previous studies were concentrating on, which fit the focus of this study.
Intelligence concerns the collective responsiveness of a workforce with regards to its ability to read and interpret external change and to adjust objectives accordingly and to act speedily in line with the subsequent strategic direction. Competencies refer to the acquisition of skills and collaboration is the workforce’s capability for collaborating effectively across projects, functional and organizational boundaries. Culture concerns the development of an internal environment that capitalizes on employee empowerment and rewards and local decision-making. The IS refers to the deployment of “a flexible IT infrastructure that supports the adaptation of existing IS and the assimilation of new systems swiftly and effectively” (Breu et al., 2002, p. 27).

Another valuable work that pinpoints the necessary capabilities for an agile workforce is the work of McCann and Selsky (2012). Based on extensive review of literature, they underline five circle capabilities of high agility and these metrics were used empirically in the study conducted by McCnn, Selsky and Lee (2009). These capabilities include (1) being purposeful (2) being aware (3) being action-oriented (4) being resourceful (5) being networked. Being aware, being action-oriented, being purposeful and being networked are similar to the capabilities of intelligence, culture, competencies and Collaboration identified by (Breu et al., 2002).

This research will develop metrics of agility based on these scholarly efforts. Specific questions were selected from the survey developed by McCann and Selsky (2012) and McCnn et al (2009) for assessing agility and resilience. Then, these questions were compared to the criteria of critical capabilities for workforce agility identified by Breu et al. (2002). Finally, these questions were revised to pertain to NPOs. Measurements of agility are depicted in section 4 of Appendix A.
4- Tendency towards Improvisation

Scholars have different emphases when studying improvisation because the concept is a multi-disciplinary phenomenon. Moorman and Miner (1998) identify two main emphases in literature: instrumental and aesthetic outcomes. Scholars stress instrumental outcomes use two particular criteria: “does the improvisation solve a problem?” and “does improvisation permit the organization to harvest unanticipated opportunities?” Researchers concentrating mainly on musical, theatrical, and other arty improvisation usually accentuate aesthetic outcomes. Clearly, research examines the value of improvisation for EM will tend to emphasize instrumental outcomes.

Cunha, Cunha and Kamoche (1999) maintain that few studies have proposed how improvisation should be measured and scholars have conceived improvisation into two clusters: degrees and forms of improvisation. For example, improvisation has been categorized as collective versus individual, product versus process and cognitive versus behavioral (Cunha et al., 1999). Moorman and Miner (1998) who, according to Cunha et al. (1999), are considered the pioneers of empirical research in improvisation, propose that the quality of improvisation can be measured in term of speed, novelty and coherence of the action resulted from improvisation. This study aims to examine the novelty or the level, not the quality, of the tendency to improvise among workers in NPOs.

Despite the significant contribution of those schools, using business literature conceptualization of improvisation for EM studies can be problematic. Criteria used by business scholars are highly influenced by business standers. For example, Moorman and Miner (1998, p.702) contend that the act will be considered as improvisational action if ‘the (customer) order
is not fully predesigned and, but is partial.’ In disaster studies building on this premise may provide inaccurate evaluation of the contribution of improvisation because there is essentially neither customer nor order.

Another issue is that since the concept of improvisation originated in the business arena, improvisation studies typically intertwined with strategic management and strategic decision-making process. This led some scholars to equate improvisational action with strategies that develop gradually without intention overtime (sometimes in years). This is also can be misleading because improvisation in the study of EM is not about changing the strategy, it is often about altering how the strategy should be implemented or translated.

Wieck (1998) discusses Berliner’s book Thinking in Jazz: The Infinite Art of Improvisation and identified four levels of improvisation: ‘Interpretation’, where people take minor autonomies, but plans are performed as written; “Embellishment”, where the plan is reshaped to some extent, but still respected; “Variation”, where unplanned actions are introduced along with the initial plan and “Improvisation” is the observed departure from the original plan.

However, conceiving improvisation as only the radical departure has serious consequences for the practical and theoretical levels.

On the practical level, this will inevitably lead to emphasizing the spontaneous aspect of improvisation and deemphasizing learning elements that are deeply rooted in routines and procedures. In the words of Vera and Crossan (2005, p. 204):

*When improvisation is restricted to the ability to "think on your feet," managers risk confusing improvisation with random moments of brilliance and conclude that either you have this ability or you do not. There is, however, much preparation and study behind effective improvisation (Weick 1998). Improvisation relies on rules and routines that are*
pre-established and rehearsed. In improvisation, it is possible to "prepare to be spontaneous" (Barrett 1998, p. 606) and to "rehearse spontaneity" (Mirvis 1998, p. 587).

On the theoretical level, treating improvisation as only the radical departure will provides few clues on how to measure improvisation in organizational settings because no clear boundaries between these discreet categories (Cunha et al., 1999). Additionally, treating improvisation as only radical departures will result in “punctuated equilibrium phenomena” (Gersick, 1991 as cited in Cunha et al., 1999, p.105). But, literature on improvisation in both organizational and musical settings illustrates that ‘the raison d'être of improvisation’ resides in its ability to trigger noteworthy changes building upon limited variations (Cunha et al., 1999, p. 105). As Pressing (1984, p.346) states that improvisation has always a referent or ‘an underlying formal scheme or guiding image.’

Thus, Cunha et al., (1999) maintain treating these phenomena as a continuum with organizational and research practice is a more useful approach. Treating improvisation as only the radical departure from plans is much rooted in musical improvisation (Cunha et al., 1999). But, improvisation in organizational context, especially in the field of EM, is influenced by far more complicated matters, such as political, administrative and social issues, than improvisation that occurs in musical context. These complications provide support for the view of Cunha et al., (1999).

Webb (2004) developed unique observations on how improvisation takes place during disasters. This work offers a perfect foundation for measuring the level of improvisation in organizational contexts during emergency times for many reasons. First, it offers various forms of improvisations during emergency periods of large-scale crises based on rich archival data
from the University of Delaware’s Disaster Research Center in the USA. Second, the author does not consider improvisation as a radical departure from the original plan, but as departures from routine. This conceptualization fits with the ‘continuum approach’ discussed above.

Webb (2004) classifies improvisations into two general types (1) non-material (2) material. While non-material improvisations refer to modifications in things that people do or how those things are done, material improvisations refer to changes in the tools or equipment used in the performing disaster roles or in the physical location where those roles are enacted. Non-material improvisations include three types: procedural, status and normative-order changes. Material improvisations include two categories: equipment and location/facility changes.

Webb (2004) provides major forms and conditions for these categories. These forms and conditions were reviewed to develop measurements of the tendency to improvise among workers in NPOs. Measurements of improvisation can be read in section 5 of Appendix A.

Structural Equation Modeling

SEM is a statistical technique that is widely employed based on theoretical models that contain latent constructs and observable items or manifests that aim to identify or to measure these constructs. In SEM, an implied variance-covariance matrix is matched or compared to the variance covariance matrix of the sample. Having said that, the goal of SEM is, then, to estimate the parameters of the theoretical model and to evaluate the fit of the model to the population in order to verify whether the hypothesized model is “consistent with the data collected to
reflect this theory.” (Lei & Wu, 2007, p. 34). A model with a good fit is that reproduce a variance covariance matrix is very close to the implied matrix (Hair, Black, Babin & Anderson, 2010).

An overview of the basic concepts of SEM and application is an important to present briefly in order to understand the statistical technique used in this study. Unobserved constructs, such as intelligence, cannot be quantified or evaluated straightforwardly. Thus, the researcher relay on observed manifests or measurements to measure such unobserved phenomena. This technique has stemmed from psychometric theories (Lei & Wu, 2007). In SEM, there are two types of unobserved or latent constructs: exogenous variables and endogenous variables. The former are analogous independent variables in a regression model and the latter are analogous to dependent variables.

SEM analysis is typically carried out through a two-step approach that was developed by Anderson and Gerbing (1988). The first step is developing the measurement model, which specifies the relationships between observed variables and latent constructs, and the second involve the estimation of the structural model, which specifies the relationship between latent construct as proposed by theory. In other words, the measurement model is estimated separately before the estimation of the full model, i.e. structural model. The measurement model is developed into two distinct steps: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). Yet, the measurement model is commonly known as CFA.

Although SEM is confirmatory in its very nature, EFA is typically employed when researchers intend to develop scale and validate constructs. EFA as it appears from its name is used in expletory manner and is a data driven technique. The researcher has no prior specification in mind regarding the number of common factors or the relationships among
between observed items and latent constructs. Thus, it is used as a descriptive data approach to identify the number of factors and the indicators that provide an appropriate estimation of latent constructs based on the scale and magnitude of factor loadings (Brown, 2013). In short, the researcher in EFA assumes that any item can be linked or related to any extracted factor.

While EFA is a data driven approach, CFA is a theory driven. EFA attempts to determine the number of factors assuming no prior knowledge between factors and their indicators. In contrast, CFA determines the number of factors and indicators based on a prior theory. Researchers in EFA attempts to find a model that fit the data whereas in CFA they seek to test the significance of the hypnotized relationships among variables in the model based on an already established theory.

In CFA, the number of factors and the indicators must be identified before running the analysis. Therefore, cross lodging is usually not permitted in CFA. In addition, correlated measurement error can be modeled (Brown, 2013). In Short, the relationships among the indicators and the constructs can be shaped in CFA whereas this is not possible in EFA. Another strength of CFA is that it enables he researcher to examine the validity of constructs in the structural model. The concept of construct validity is central to the evaluation of measurement model in SEM.

The path or structural model is an analysis of the relationships among many unobserved constructs. The model can contain more than one dependent variable. In short, path model involves several multiple regression equations that are regressed simultaneously. In the path model, a latent construct can serve as an endogenous construct or an exogenous construct. It is also possible that a construct can serve as an endogenous and exogenous construct in the same
model. If a latent serve as an endogenous and exogenous constructs, such as agility and self-efficacy in this study, it is called a mediator.

1- Strengths of Structural Equational Modeling

SEM has several advantages over traditional approaches. First, SEM has been considered as flexible technique. While traditional techniques allow the researcher to examine only observed variables that can be measured directly, SEM incorporates observed and unobserved or constructs. Besides, there is a flexibility in modeling and specifying path equations, incorporating multiple independent (exogenous) and dependent (endogenous) variables and the possibility of specifying reciprocal relationships in the model. Moreover, SEM measures the relationships among these constructs simultaneously. This, in turn, allows understanding the complex relationship among unobserved phenomena (Schumacker & Lomax, 2010). In addition, Monecke and Leisch (2012) maintain the graphical language in SEM makes the complex relationships are easy to understand.

The second reason is probably the most widely underscored reason by scholars to indicate the superiority of SEM over traditional approach. SEM explicitly accept the ‘imperfect nature’ of the indicators used in the model, control for the error in the measurements when analyzing the data and test the validity of the construct (Rigdon, 2013). SEM gives greater recognition to validity and reliability (convergent and discriminate validity) of observed indicators (Schumacker & Lomax, 2010). This is important because in social sciences, the measurements are rarely without error (O'Rourke & Hatcher, 2013).
Third, while traditional techniques carry out the analysis straightforwardly, CFA precedes SEM. This helps to choose a parsimonious model through many criteria such as factor loading and evaluation of the model fit (Brown, 2006). Furthermore, SEM is superior because it can conduct analyses that are more advanced such as group differences using multiple group SEM models (Schumacker & Lomax, 2010). This feature is important because it enables the researcher to find the source of variation among different groups (Brown, 2006).

Despite the strengths of SEM, many critics have been leveled at this statistical tool. Hox and Bechger (1998) maintain these critiques revolve around two areas. The first is that, applied research that utilizes SEM tend to be unaware of technical or statistical assumptions that are critical to trust the results of this research such as normality and the need for a large sample because small samples usually create problems in the analysis (e.g. Heywood cases) (Lee & Kyle, 2012).

The second area is concerning the interpretation of the findings of SEM. Many authors stress that the findings of SEM cannot and should not be interpreted in a causal relationship among construct (Hox & Bechger, 1998). Hox and Bechger (1998, p. 15) state “nothing in structural equational modeling that magically transfer correlation data into causal conclusion.” Similarly, Allbritton (2007) indicates that SEM does not provide evidence of causal relationships among latent constructs. This is because the relationships among constructs are usually evaluated by cross-sectional data, which reflects the observations at one point in time. Consequently, the conclusion suggests association not causation.

Another limitation of SEM is that the use of SEM necessitates a prior specification of the model meaning this tool is limited to confirmatory research and inappropriate for explanatory
analysis (Kyle, 2012). Hoyle (2008) argues that there are also costs for learning this type of
technique because of the difficulties in comprehending the terminology, notions and learning
how to use SEM software.

2- Goodness of Fit Criteria

Evaluating and assessing the fit of the model is an important theoretical topic to SEM.
However, there is a dispute or disagreement about this issue in SEM literature. This section
presents the criteria used to assess the goodness of fit in SEM.

Construct Validity

Construct validity tests ‘the degree to which a scale measures what it intends to
measure’ (Garver & Mentzer, 1999, p. 34). The concept of construct validity is typically
composed of two sub concepts: convergent and discriminant validity (Woo & Pettit, 2011).
Convergent validity, which is also termed as construct reliability, is the degree to which
manifests that are specified to measure the same latent construct related to each other. In
other words, this concept examines reliability at construct level after testing reliability for
individual indicators in CFA.

Convergent validity is typically evaluated by calculating composite reliability. Composite
reliability is similar to Cronbach's Alpha and was developed by Werts, Linn and Jöreskog (1974)
to measure the internal consistency for latent constructs. However, scholars have recognized
composite reliability as superior because Cronbach's Alpha has numerous limitations. For
example, Werts et al. (1974) pointed out that their scale (i.e. composite reliability) does not
assume that all items of a construct are equivalent (i.e. have equal weight or contribution) as Cronbach's Alpha does.

Fornell and Larckers (1981) stress that the composite reliability uses the indicators loading obtained in a causal model, which provide estimation that is more accurate. Garver and Mentzer (1999) maintain composite reliability is less sensitive to the number of items. Thus, Cronbach’s Alpha tends to be artificially inflated when the number of manifests is large. In addition, composite reliability accounts for error (Ping, 2004 in Jiang, 2014, p.199). Therefore, composite reliability is safer and more reliable than the value of Cronbach’s Alpha.

Another key measurement of convergent validity for latent constructs is Average Variance Extracted (AVE). AVE gives “the amount of variance that a latent variable component captures from its indicators relative to the amount due to measurement due to measurement error” (Fornell & Larcker, 1981, p. 45). Brettel and Boehm (2008) indicate that while composite reliability examine the association among individual variables, this scale test the amount of variance explained by a latent construct relative to the observed variance.

The second sub-concept that is frequently used when the researcher evaluates the validity of a construct is discernment validity. Discernment validity is concerned about whether the latent constructs in the model are theoretically distinct from each other or to what extent they measure different constructs. According to Bagozzi, Yi and Phillips (1991) discernment validity requires the measurements of latent constructs to have weak relationships with latent constructs they are not supposed to measure.
**Fit Indices**

Model fit indices are measures that determine the model fit to date. The Model fit is “the degree to which the sample variance - covariance data fit the structural model” (Schumacker & Lomax, 2010, p. 85) meaning these fit indices are based on the discrepancies between the observed and implied variance – covariance matrices. Yet, the significance of the relationships between constructs in the identified model has no relevance with achieving acceptable thresholds for fit indices. Moreover, achieving acceptable fit indices do not imply the model is theoretically correct. It means the model gives an acceptable description of the study's data (Biddle & Marlin, 1987). However, achieving acceptable fit indices is an essential step that the researcher must obtain to move forward and examine the significance of particular paths in the model.

Despite the importance of fit indices, there is “no single statistical test that best describes the strength of the model's predictions” (Hair et al., 2003 as cited in Raoprasert & Islam, 2010, p.113). There is no agreement among scholars on which indices should be reported and the cut-offs for these indices (Hooper, Coughlan & Mullen, 2008). Nuno (2008) argues that reporting fit indices is mostly a matter of personal or a journal editor preference. Stevens (2012) agrees with this view and maintains there is a great confusion about of which indices to report. He points out while some researchers select them arbitrary based on personal believes, other relay on only a single index.

However, there seems to be a concurrence to report several indices that represent different classes of indices to overcome the limitations or shortcomings of each group. Scholars offer different classifications of fit indices. For example, while Stevens (2012) and McDonald,
and Ho (2002) believe fit indices generally categorized into two types, Kline (2011) classifies these indices in four categories. However, in general, researchers agree fit indices are classified in three categories: (1) absolute fit indices (2) incremental (also called comparative) fit indices (3) parsimony fit indices (Teo, Liang & Chih-Chien, 2013; Byrne, 2012; Schumacker & Lomax, 2010).

The first two categories are the typical categories or the traditional categories reported by researchers. While absolute fit indices attempt to calculate the difference between the identified model and without any comparison with other models, the incremental fit indices compare different models (Stevens, 2012). Parsimony fit indices assess the difference between the observed and implied covariance matrix taking into account the complexity of the model (Teo et al., 2013). This paper will attempt to represent all of these categories by reporting fit indices from each category.

The absolute fit indices are also called the “badness of fit indices” because the values that are close to zero indicate good fit to the date whereas large values indicates the difference between the observed and implied covariance suggesting the model does not fit the data. A main measure that usually reported in SEM studies is Chi-square. The significant value of Chi square (p < .05) suggests the model fits the data badly. However, Chi-square often shows a significance values because its value influenced by the sample size and the violation of multivariate normality. Sample over 200 often get statistically significant values even if the other measures of the model suggest good fit (Onwuegbuzie, Jiao & Bostick, 2004). Thus, the values of Chi-square are often used to compare them to each other in order to obtain the best fit for a model.
Another Chi-square value that is less sensitive to the sample size and is often reported in SEM research is the relative chi-square and termed the normed chi-square. This value calculates the ratio of chi-square to the degree of freedom. A value less than 5 is considered as general “rules of thumb” to recognize the model with a good fit (Appleton, Christenson, Kim & Reschly, 2006). Another important criterion to assess the fit of the model Mean Square Error of Approximation (RMSEA), which takes into account parsimony and less influenced by sample size (Farrall, Jackson & Gray, 2009).

According to Diamantopoulos and Siguaw (2000), RMSEA is generally considered the most informative index. Value of RMSEA less than .05 suggests the model has a good fit. The value above .05 and less than .08 indicates the model has a reasonable fit and value between .08 and .10, the model mediocremly fits the data. The value above .10 implies the model has a poor fit (Diamantopoulos & Siguaw, 2000). The Goodness of Fit Index (GFI) also will be reported to represent this category. The general accepted cutoff value for this index is .90.

Incremental fit indices are represented by the Comparative Fit Index (CFI). The logic of CFI is that it compares the hypothesized model to the baseline or the null model to assess the comparative lack of fit. The Incremental Fit Index (IFI) is also reported within this category. CFI and IFI are also considered as parasimmons indices. The accepted levels for these indices are to exceed .90. The parsimony fit indices are represented by reporting Parsimony Goodness of Fit Index (PGFI) and Parsimony Normed Fit Index (PNFI). Although there is no cut-off point for parsimony fit indices, values in the range of .50 are typically acceptable (Jahns & Lockström, 2007; Mulaik, et al., 1989).
Chapter 5 presented the research design and methodology, including a detailed description of the study site and the justification for the appropriateness of the study’s site for emergency studies. Besides, the procedures employed for data collection and the study’s population is described. It also described the theoretical justifications of the measurements of each latent construct used in this study. Finally, an overview of the strength and weakness of SEM and descriptions of its fit indices were given. The next Chapter presents a detailed description of the method of analysis.
CHAPTER 6

METHOD OF ANALYSIS

This chapter starts by an analysis of the data used in this study by discussing how data used in paper is prepared and screened for important assumptions of SEM, such as multicollinearity. In addition, Chapter 6 discusses the issue of missing data and the appropriateness of the sample size, in light of different recommendations and views of SEM researchers. Then, a brief description of the descriptive statistics of the data utilized in this study is presented.

A large part of this chapter outlines the steps taken to develop the measurement model, i.e. EFA and CFA. The first step is the EFA in which factor loading is used to explore the underlying factor structure of the items used in the survey instrument. The second step is CFA is the main step for developing the measurement model in SEM. Since this step is important for understanding the development of the measurement model in SEM studies, all details of the performed processes are provided in this chapter.

Data Preparation and Screening

The sensitivity of SEM to the data is well documented in literature (see for example, Fan, Thompson & Wang, 1999). There are certain assumptions that are crucial for the validity of the findings of this technique and failure to meet these assumptions will lead to untrusted results. Therefore, analyzed data needs to be scrutinized closely to find out if this data fulfils these rules or not. These assumptions include normality, lack of multicollinearity and sample power. SEM is also vulnerable to shortcomings in the data such as missing data and outliers (Schumacker &
Lomax, 2010). Before to examine these assumptions, it is important to prepare the data for such an examination. The next section elaborates on how missing values in the data was treated in this study and provided an overview of the characteristic of this data.

1- Missing Data

Most statistical analyses were originally developed on the assumption that data is complete (Graham & Coffman, 2012). Therefore, missing data affects analysis because the values not actual ones for every variable. Researchers have many options to deal with this issue. These options include deleting these values, replacing these values or utilizing robust statistical procedures provided by various SEM software (Schumacker & Lomax, 2010). The survey utilized in this study was relatively short. An inspection the data of this study indicates that only 45 cases are missing.

However, the deletion of these values (either pairwise or listwise deletion) may not be an appropriate option when conducting SEM. According to Graham and Coffman (2012), pairwise approach is not recommended in SEM because of three reasons. First, pairwise technique can cause the covariance matrix to be not a positive definite. Second, it may lead to a bias estimation of the parameters. Third, standard errors are not estimable straightforwardly. With regard to listwise deletion, Kline (2011) pointed out this approach usually generates larger standard errors than those yielded based on the entire data set. Schumacker and Lomax (2010) assert that cases lost with listwise deletion are frequently problematic because listwise deletion would possibly lead to substantial reduction in sample size. They recommend modern imputation methods instead.
Handling missing data depend on the patterns of missing data (Harrington, 2008). According to the author, there are three types of missing data: (1) missing completely at random (MCAR) (2) missing at random (3) nonignorable or missing at not random. Therefore, it was important to examine what type of missing data in the current data in order to decide how to handle this issue. Little (1988) has developed a statistical analysis that is performed in SPSS software in which a chi-square is generated. A significant value suggests that the data are not MCAR and vice versa.

I conducted the test and the chi-square yielded $\chi^2 = 523, P = .822$ indicating that the data missing is completely at random. According to Meyer (2014), when the data is MCAR, multiple imputation methods are recommended because these techniques generate unbiased estimates. Thus, I decided to replace missing values using multiple imputation methods in SPSS software. This resulted in a sample of 304 cases.

2- Sample Size

Although there is an agreement among scholars that sample size affect the ability of the model to obtain accurate estimation for parameters as well as standard errors, there are no clear-cut guidelines for the minimum sample for SEM. For example, Hair et al. (2010) indicate that although samples as low as 50 may provide valid results, they recommend 100-150 as a minimum sample size. Raykov and Widman (1995), provide four elements based on which the sample size need to be determined. These elements include model size, departure from normality, method of estimation and model misspecifications. They suggest the minimum ratio of sample size to ten cases for each free parameter. Bentler and Chou (1987) believe the ratio
can be low as 5:1. Kline (2011) suggested the ratio to be 10 to 20 cases for each parameter. The sample size in this study is 304 that is well above all of these suggested rules.

3- Descriptive Statistics

The descriptive statistics shows the majority of respondents are male (268 respondents; 88.2%). The number of employees of NPOs in Makkah is higher than the number of employees from NPOs in Jeddah and Madinah. The sample contains 122 employees from Makah versus 107 and 75 from NPOs in Jeddah and Madinah respectively. The budget question in the survey shows no variation because all the organizations have budgets above 1000000 suggesting the need for more groups in order to be able to classify them financially. Concerning the level of respondents’ education, most respondents hold bachelor degrees (217 respondents).

The organizations in the sample can be grouped into two categories based on the age of organizations. The first category includes organizations established in the 1970s, 1980s and 1990s. This category constitutes of 7 organizations and 168 employees. The second category includes 6 organizations that were established after 2000 and is comprised of 136 employees. NPOs in this sample vary in the number of full-time staff from as low as 15 or 30 full-time staff to 350 fulltime staff. The mean for the number of full-time staff is 163 employees.

Similarly, organizations in this study vary in the number of volunteers. While one organization participated in this study has no volunteers, some organizations have high number of volunteers that can reach 200. On average, respondents spent about 7 years in service. The lowest value for years spent in service was one year whereas the highest value was 26 years. Appendix B shows descriptive statistics for all survey questions.
Measurement Model

1- Expletory factor analysis

In EFA technique, factor loading is used to uncover the underlying factor structure of a large set of indicators (Fernandez, 2010). Factor loadings are correlation coefficients between variables and factors meaning the correlations are the corner stones of EFA. Since correlation can get larger with large samples, the SPSS program generates the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, which measures the adequacy of the sample size for EFA.

Kaiser (1974) recommends the values of KMO statistic to be greater 0.5 to consider the sample size to be adequate for EFA. Hutcheson and Sofroniou (1999) consider values that range between .5 and .7 to be normal, values greater than .7 and less than .8 are good, values greater than .8 and less than .9 are great and values above 0.9 are excellent. Pallant (2001) suggests a bare minimum 0.6. The value of KMO and Bartlett's Test for the sample used in the analysis is shown in Table 5 suggesting the sample size is adequate for EFA.

Table 5: KMO and Bartlett's Test

<table>
<thead>
<tr>
<th>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</th>
<th>.802</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett's Test of Sphericity</td>
<td></td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
<td>1807.248</td>
</tr>
<tr>
<td>Df</td>
<td>91</td>
</tr>
<tr>
<td>Sig.</td>
<td>.000</td>
</tr>
</tbody>
</table>

I performed EFA using 30 survey items. The EFA confirms the prior theoretical distinction made between latent constructs developed earlier by producing four factors with 14 items. The factor lodging of these items is based on the value identified by Hair et al. (2010) (i.e. the cut off for factor lodging is > .5). The factor matrix is depicted in Table 6. 
Table 6: Rotated Factor Matrix

<table>
<thead>
<tr>
<th></th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>My organization builds alignment of visions across different levels and work groups</td>
<td>0.567</td>
</tr>
<tr>
<td>My organization encourages people to get answers from across the organization when solving problems</td>
<td>0.606</td>
</tr>
<tr>
<td>In my organization, people are rewarded for exploring new ways of working</td>
<td>0.567</td>
</tr>
<tr>
<td>My organization gives people control over the resources they need to accomplish their work</td>
<td>0.735</td>
</tr>
<tr>
<td>In my organization, leaders generally support requests for learning opportunities and training</td>
<td>0.602</td>
</tr>
<tr>
<td>Solve problem and generating novel ideas</td>
<td>0.715</td>
</tr>
<tr>
<td>Cooperate and collaborate with other agencies</td>
<td>0.606</td>
</tr>
<tr>
<td>Deal effectively with unexpected events</td>
<td>0.987</td>
</tr>
<tr>
<td>Good at making sense of ambiguous, uncertain situations</td>
<td>0.856</td>
</tr>
<tr>
<td>Take advantage of opportunities quickly</td>
<td>0.587</td>
</tr>
<tr>
<td>Good at quickly deploying and redeploying resources to support execution</td>
<td>0.688</td>
</tr>
<tr>
<td>Workers believe experimenting unplanned and new solutions can increase the effectiveness of the organization</td>
<td>0.779</td>
</tr>
<tr>
<td>During disaster and crises, workers sometimes takes on new activities that he or she may or may not be authorized to do vis-a-vis the role</td>
<td>0.642</td>
</tr>
<tr>
<td>During disaster and crises, workers sometimes issue orders to others over whom he or she ordinarily has no authority</td>
<td>0.784</td>
</tr>
</tbody>
</table>

**Final Measurements**

The final sets of measurements that are used in as manifests for the latent constructs the study are shown in the Tables 7. I also provide the item titles for indicators used hereafter when referring to these variables.

**Multicollinearity**

The generated data underwent additional screening to make sure that it confirms to important assumptions of SEM. One of the main assumptions of SEM is that there is lack
Table 7: Final Measurements

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measurement items</th>
<th>Item titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Learning (OL)</td>
<td>My organization builds alignment of visions across different levels and work groups</td>
<td>[AligLevl]</td>
</tr>
<tr>
<td></td>
<td>My organization encourages people to get answers from across the organization when solving problems</td>
<td>[AnswOrga]</td>
</tr>
<tr>
<td></td>
<td>In my organization, people are rewarded for exploring new ways of working</td>
<td>[EplorWay]</td>
</tr>
<tr>
<td></td>
<td>My organization gives people control over the resources they need to accomplish their work</td>
<td>[ContResu]</td>
</tr>
<tr>
<td></td>
<td>In my organization, leaders generally support requests for learning opportunities and training</td>
<td>[LedrSupr]</td>
</tr>
<tr>
<td>Self-efficacy (SE)</td>
<td>Solve problem and generating novel ideas</td>
<td>[SolvProl]</td>
</tr>
<tr>
<td></td>
<td>Cooperate and collaborate with other agencies</td>
<td>[CoopColb]</td>
</tr>
<tr>
<td></td>
<td>Deal effectively with unexpected events</td>
<td>[DealEfec]</td>
</tr>
<tr>
<td>Agility (AGA)</td>
<td>Good at making sense of ambiguous, uncertain situations</td>
<td>[SensAmbg]</td>
</tr>
<tr>
<td></td>
<td>Take advantage of opportunities quickly</td>
<td>[TakeAdvn]</td>
</tr>
<tr>
<td></td>
<td>Good at quickly deploying and redeploying resources to support execution</td>
<td>[QukDploy]</td>
</tr>
<tr>
<td>Tendency Towards Improvisation (IMPRO)</td>
<td>Workers believe experimenting unplanned and new solutions can increase the effectiveness of the organization</td>
<td>[ExprUnpl]</td>
</tr>
<tr>
<td></td>
<td>During disaster and crises, workers sometimes takes on new activities that he or she may or may not be authorized to do vis-a-vis the role</td>
<td>[NewActiv]</td>
</tr>
<tr>
<td></td>
<td>During disaster and crises, workers sometimes issue orders to others over whom he or she ordinarily has no authority</td>
<td>[IsueOrdr]</td>
</tr>
</tbody>
</table>

multicollinearity. Some degree of multicollinearity is very likely to be present in statistical analysis, particularly in social phenomena (Frank, 1992). However, when two or more indicators of a construct have high correlation, they might have a common attribute in common meaning they are measuring the same thing. Thus, it is maybe redundant to have both of them (Kline, 2011). Detecting multicollinearity is not an easy task (Frank, 1992). Nevertheless, various authors have stressed certain mechanisms. Kline listed the most three frequently used methods to detect multicollinearity:
correlation greater than \( r = .90 \); tolerance value \( < .10 \) and variance inflation factor (VIF) > 10.
However, it should be mentioned that literature has different opinions on the cutoff of these values. Kline also pointed out that multicollinearity might occur among latent constructs when correlation so high reveling that there are not distinct. I examined the correlation among manifest variables and no pair has very high correlation (i.e. greater than 0.9). I also inspected the values of tolerance and VIF and none of them exceeded the cutoff values and results are depicted in Table 8. Furthermore, I also examined the bivariate correlation of factors’ scores and the test did not indicate any significant correlation at .05 level (2-tailed).

Table 8: Tolerance and Variance Inflation Factor.

<table>
<thead>
<tr>
<th>Model</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>AligLevl</td>
<td>.374</td>
</tr>
<tr>
<td>AnswOrga</td>
<td>.468</td>
</tr>
<tr>
<td>EplorWay</td>
<td>.571</td>
</tr>
<tr>
<td>ContResu</td>
<td>.469</td>
</tr>
<tr>
<td>LedrSupr</td>
<td>.379</td>
</tr>
<tr>
<td>SolvProl</td>
<td>.574</td>
</tr>
<tr>
<td>CoopColb</td>
<td>.703</td>
</tr>
<tr>
<td>DealEfec</td>
<td>.501</td>
</tr>
<tr>
<td>SensAmbg</td>
<td>.584</td>
</tr>
<tr>
<td>QukDploy</td>
<td>.497</td>
</tr>
<tr>
<td>TakeAdvn</td>
<td>.560</td>
</tr>
<tr>
<td>ExprUnpl</td>
<td>.704</td>
</tr>
<tr>
<td>NewActiv</td>
<td>.716</td>
</tr>
</tbody>
</table>

The inspection of VIF values indicates the highest VIF values are those belong to the indicators of OL. These values are 2.659, 2.077, 2.115 and 2.624 for the variables AligLevl, AnswOrga, ContResu and LedrSupr respectively. Allison (1999) proposes that VIF > 2.5 and tolerance values < 0.4 may suggest the presence of multicollinearity. The table above shows tow variables with VIF greater than 2.5 and tolerance less than 0.4. Furthermore, I noticed the correlation among the indicators of OL is relatively higher than the correlation among all other
indicators. Three pairs of correlations where above .6. According to many authors, the correlation above 0.5 and 0.6 requires attention and close examination because the potential for multicollinearity is present (see for example, Tarling, 2008; Frank1992).

An important tool for the detection of multicollinearity is looking to eigenvalues of the principle components of the independent variables. Broadly speaking, condition indices around 5 and 10 may indicates multicollinearity is not a serious problem (Mazzocchi, 2008; Kim & Qu, 2002). Condition indices greater than 15 indicates a possible multicollinearity and indices greater than 30 indicates the potential for serious problem (Belsley, Kuh, & Welsch, 1980). The components with high condition indices and large variance proportions for more than one variable, suggest the indicators involved in multicollinearity.

The eigenvalues of the principle components of OL variables are shown in Table 9. The table shows that variables AnswOrga and EplorWay have a relatively high variance proportions in the first and second components, which indicates these variables have a strong correlation. Further, indicators AligLevl and ContResu in component 4 and AligLevl, AnswOrga, ContResu and LedrSupr in component 5 with condition index 17.625. Although the issue of multicollinearity is not a serious issue because no modification index has exceeded the threshold identified in literature (i.e. 30), there seems to a mild multicollinearity that involves almost all the indicators of OL.

Table 9: Eigenvalues of the Principle Components of OL

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Eigenvalues</th>
<th>Condition Index</th>
<th>AligLevl</th>
<th>AnswOrga</th>
<th>EplorWay</th>
<th>ContResu</th>
<th>LedrSupr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.067</td>
<td>9.259</td>
<td>.01</td>
<td>.33</td>
<td>.62</td>
<td>.00</td>
<td>.01</td>
</tr>
<tr>
<td>2</td>
<td>.060</td>
<td>9.836</td>
<td>.02</td>
<td>.28</td>
<td>.23</td>
<td>.05</td>
<td>.06</td>
</tr>
<tr>
<td>3</td>
<td>.041</td>
<td>11.829</td>
<td>.05</td>
<td>.02</td>
<td>.09</td>
<td>.15</td>
<td>.12</td>
</tr>
<tr>
<td>4</td>
<td>.032</td>
<td>13.537</td>
<td>.49</td>
<td>.10</td>
<td>.05</td>
<td>.44</td>
<td>.04</td>
</tr>
<tr>
<td>5</td>
<td>.019</td>
<td>17.629</td>
<td>.43</td>
<td>.26</td>
<td>.00</td>
<td>.36</td>
<td>.77</td>
</tr>
</tbody>
</table>
Since there was no pair of correlated variables can be determined. Moreover, Freund and Wilson (1998) pointed out that multicollinearity should be evaluated comparative to the overall fit of the examined model. No variable will be deleted until the measurement model examined to be certain about the most problematic indicator.

**Normality**

Another assumption of SEM is normality. There are two types of normality: univariate and multivariate normality. The former assumes that each indicator is normally distributed. The latter postulates that every indicator has normal distribution with other indicators. Researchers need to examine both types when conduction SEM (Tabachnick & Fidell, 2007). Typically, univariate normality for continuous variables is examined by generating absolute values of skewness and kurtosis. Multivariate normality is assessed by Mardia’s test for multivariate skewness and kurtosis. It is important to underline that multivariate normality assumes endogenous variables are continuous (Kline, 2012).

Schumacker and Lomax (2010) delineated many reasons that cause the non-normality of the data and among those causes is the scaling of variables. According to them, ordinal scaling causes the data to be not normally distributed. This point triggers the question of how ordinal variable should be classified or treated when conducting SEM. Finding out the answer to the question is critical for confirmation to normality assumption in this study. In short, there is an ambiguity and no consensus about how to consider ordinal variable in SEM. In particular, the debate centers on whether to consider ordinal variables as continues variables or not.
On one hand, scholars who believe that ordinal variables are not continuous variable and should not be treated as such because “means, variances, and covariances of ordinal variables have no meaning” (Jöreskog & Sörbom, p.146). As a result, the yielded results may be misleading. They assert that when ordinal variables are used in the analysis, Asymptotically Distribution Free (ADF) estimators such as Weighted Least Squares (WLS) and Diagonally Weighted Least Squares (DWLS) should be used because these methods run the analysis using polychoric correlation, asymptotic covariance matrix and asymptotic variance.

On the other hand, many scholars believe that ordinal variables can be treated as continues variables using the Maximum Likelihood (ML) estimation method. Byrne (2009) offers excellent discussions over the topic and some of these views and observations are excerpted here. Byrne (2009) points out that the positive characteristics of method appropriate for ordinal variables (i.e. WLS, DWLS) are offset by many impediments. For example, these methodologies need large sample and the number of observed variables should not exceed 25 variables. In addition, Byrne (2009) cites many authors who assert that when indicators have four or more categories, continuous method can be used because the failure to address the ordinality of the data is very slim. Furthermore, ML procedures are less problematic when using covariance rather than correlation. Thus, according to him, it is not surprising that most psychological research over the past 15 years was based on data that used Likert scale and ML procedures.

Similarly, West, Finch and Curran (1995) maintains that ADF estimators are problematic when the sample size is less than 1000. In fact, even Jöreskog and Sörbom (1996) agree that WLS needs a very large sample suggesting the use of ML procedures if the sample is not big enough because WLS can do more harm than good in this case. Finney and DiStefano (2006)
indicate that WLS tend to breakdown when there are more than two factors and eight items and when the sample is less than 500.

Olsson, Foss, Troye & Howell (2000) examined the impact of three estimation methods (ML, WLS, Generalized Least Squares (GLS)) on indexes of fit and parameter bias using different sample sizes. They conclude despite suggestions in the literature that WLS is preferable when data are not normally distributed, WLS can yield estimates and fit indexes close to those obtained for ML and GLS only for large sample sizes (N = 1,000 and 2,000) and slightly misspecified models. Otherwise, WLS tended to provide unreliable estimates and over-optimistic values of fit.

Clearly, there is no agreement on how to hand ordinal data in SEM applications. Furthermore, there are no clear-cut rules for the measure of non-normality (In’nami & Koizumi, 2013). In light of these risks, choosing the method of analysis was not an easy choice. However, I decided to run the analysis using DWLS, because it works better than WLS when the sample is not very large (Kline, 2011) and recent studies shows it performs better than WLS (Woods & Edwards, 2007). The DWLS technique assumes non-normality of the data and estimate variance and covariance under this assumption.

2- Confirmatory Factor Analyses

Two different types of CFA have been employed in statistical analysis in various social sciences: first order and second order CFA. Prior research has used a first order more than second order CFA (Zou, 2009). Nevertheless, researchers are frequently faced with the important question "When should the researcher specify and examine first order factors as
compared to second order factors?" (Garver & Mentzer, 1999, p. 34). According to Chen, Sousa, and West (2005) and Garver and Mentzer (1999), the answer to this question should base on statistical and theoretical justifications.

From a statistical point of view, they maintain that the second order CFA measurement models are appropriate when the latent constructs in the first order are strongly correlated. Garver and Mentzer (1999) believe when the correlation coefficients between first order factors greater than .70, the measurement model should be identified as a second order CFA and vice versa. The use of second order CFA measurement models can also be justified theoretically when there is a hypothetical reasoning that explains the association among the factors of the first order. In this study, none of these justifications is present. Thus, a first order CFA is employed.

Schumaker and Lomax (2010) recommended five distinct steps for developing SEM: model specification, model identification, model estimation, model testing and model modification. Model specification is concerning the development of theoretical model (i.e. determining latent constructs and their measured variables) based on relevant theories and research. This step has been already done in Chapter 4.

Model Identification

An important step in SEM applications is model identification, which is concerned whether there is sufficient information in the sample variance - covariance matrix to get unique solutions for the parameters of the model. There are three different levels of model identifications in SEM.
1- Under identified model where the information in the variance - covariance matrix is not sufficient to obtain a unique solution or estimation for all the parameters in the model.

2- Just identified model where there is just enough information to obtain unique solution or estimation for all the parameters in the model.

3- Over identified model where there is more than one estimate can be calculated for each parameter because there is more than enough information.

This condition of identification is called by Schumaker and Lomax (2010) as order condition which the number of parameters to be estimated must be less than or equal to the number of data points in the variance - covariance matrix. Byrne (2009) indicates that the aim of SEM is to develop a model that meets the condition of overidentification because it results in a positive degree of freedom that permits to reject the model. According to him, a just identified model is not scientifically interesting because the model can never be rejected. The formula for meeting the minimum requirement for identification is provided by Diamantopoulos and Siguaw, (2000).

\[ t \leq \frac{s}{2} \]

Where \( t \) = the number of parameters to be estimated

\( s \) = the number of variances and covariances among the observable indicators, calculated as \( (p + q) (p + q + 1) \)

\( p \) = the number of y-variables

\( q \) = the number of x-variables

The number of parameters to be estimated in the initial model is 34 (10 regression coefficient, 18 variances- 14 error variances and 4 factor variances, and 6 covariances).

\[ s = (5+9) (5+9+1) \]
\[ s = 210 \]
\[ s / 2 = 105 \]
\[ 34 \leq 105 \]

The model meets the criterion of overidentification and we have a model with \( df = 71 \) (\( 34+71= 105 \)). According to Schumaker and Lomax (2010), an important step that is related to identification is to determine a measurement scale of each construct and this is done in one of two ways. One way is fixing the loading of one of the manifests of each construct to one and this is the typical approach. The fixed indicator is called the reference variable. The need for reference variable is because these constructs are unobservable and ‘have no definite metric scale’ (Byrne 2009, p. 29). Another way is fixing the variance of each construct to one.

In this study, I fixed one of the manifest of each construct to one. A common practice in SEM is to fix the variables that load most heavily on the factor represent each latent construct. Thus, I fixed AnswOrga, DealEfec, SensAmbg and ExprUnpl to equal one.

**Model Estimation**

This step refers to the process of determining the right procedures for estimating the parameters in the model. The goal of this process is to choose the statistical methods that minimize the difference between the estimated and observed matrix. This step has been elaborated earlier under the normality section and it was determined this analysis will be carried out using fitting function DWLS.
Model Testing

The initial model used to test whether the model will be used in this study will fit data or not consist of 14 variables that were extracted from EFA. The initial model tested in this run is depicted in Figure 5. All the measurements of the four constructs (i.e. organizational learning, agility, self-efficacy and tendency towards improvisation) tested in this research were subjected to CFA to assess the measurement model before testing the structural model. Using LISREL 9, the proposed model demonstrated a reasonable fit to the data. The initial measurement model yielded $\chi^2 (71) = 227.16$ which means the ration of $\chi^2 / df$ is 3.19 which is less than 5. CFI = 0.95, RMSEA is .09, IFI is .95 and the GFI is .98, PNFI .67 and PGFI .64. All these value fall within accepted levels recommended by scholars. Other fit indices also fall within accepted criteria. For example, The Normative Fit index (NFI) yielded .93 and Non-normed Fit Index (NNFI) = .94.

Figure 5: The Proposed Structural Model

A wildly used strategy by researchers to contrast the fit of the model in relative way by developing an alternative or competing model to contrast with the proposed model. These
model or models must be in a nested sequence. That is “if one is a proper subset of the other” (Kline, 2011, p. 214). Model A is said to be nested in Model B if both models have the same variables but one or more of the parameters are fixed to certain value, typically zero (Burnette & Williams, 2005). The rationale behind this test is to enable direct comparison between the models using chi-square difference test and find out the most parsimonious model with good fit to the data (Kelloway, 1998).

The nested chi-square or the difference in chi-square values between the compared models and the difference in the degree of freedom are calculated. Then, if the difference in chi-square exceed the critical chi-square related to the degree of freedom, the nested model will be rejected (Burnette & Williams, 2005). According to Kelloway (1998), the best source for developing a competing model is previous frameworks in literature. If there is no reasonable alternative offered in literature, nested models may be accomplished by fixing one or more parameters. This is generally can be achieved by constraining all interfactor correlations to zero, which result in orthogonal factors, or constraining parameters to one, which generate unidimensional model.

I constrain all interfactor correlations to equal zero. Table 10 shows the comparison between the models. The calculation shows that nested chi-square is statistically significant meaning the four factor oblique (i.e. correlation is allowed among factors) fit the data significantly better than four factor orthogonal.

Table 10 : Chi-square Test for Nested Model.

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Chi-square</th>
<th>Degree of freedom</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-factor oblique</td>
<td>227.16</td>
<td>71</td>
</tr>
<tr>
<td>4-factor orthogonal</td>
<td>312.82</td>
<td>77</td>
</tr>
</tbody>
</table>

Nested χ², p <0001
The fit indices in Table 11 also show the superiority of the four factor oblique.

Table 11: Fit Indices for Nested Model

<table>
<thead>
<tr>
<th>Model</th>
<th>GFI</th>
<th>AGFI</th>
<th>RMSEA</th>
<th>NFI</th>
<th>CFI</th>
<th>PGFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-factor oblique</td>
<td>.98</td>
<td>.97</td>
<td>.09</td>
<td>.93</td>
<td>.95</td>
<td>.66</td>
</tr>
<tr>
<td>4-factor orthogonal</td>
<td>.78</td>
<td>.70</td>
<td>.16</td>
<td>.91</td>
<td>.78</td>
<td>.57</td>
</tr>
</tbody>
</table>

Model Modification

Although the values in Table 11 fall in the accepted ranges for fit indices, the discrepancies between the predicted covariance matrix and the observed matrix is relatively high as expressed in the value of RMSEA. Although the value of RMSEA is less than 1, it exceed the preferred values. Adding or deleting parameters is a common practice to improve the fit of the model at this stage. SEM programs predict the potential changes in model fit expressed in changes in Chi-square by adding or deleting parameters.

I examined the outputs of the model and I found the modification indices suggest adding error covariance between three of OL indicators namely, AligLevl, EplorWay and LedrSupr with the variable AnswOrga. Furthermore, when two indicators of OL drooped, they resulted in a significant improvement in the model fit. These indicators are AnswOrga and AligLevl. I inspected the correlation matrix and found the correlation between these indicators 0.70. Moreover, the largest negative standardized residual with a value -3.174 was also related to the variable AnswOrga. Analyzing these suggestions in the light of multicollinearity diagnostics above, AnswOrga seems to be problematic. Even theoretically, AnswOrga and AligLevl seem to be related.

Literature that discusses remedies for multicollinearity (e.g. Rovai, Baker & Ponton, 2013), as well as SEM literature, frequently advice to delete collinear variables that leads to innocuous change because it will lead to substantial loss of statistical power. I drooped the
variable AnswOrga from the model and there was a substantial reduction in the value of RMSEA reveling that this indicator influencing the model fit to the data considerably. The CFI values increased from .95 to .96 suggesting the variable AnswOrga has substantially worsen the model’s fit. Table 12 shows the differences in some fit indices between the two models that reflect the superiority of the second model.

Table 12: Initial and Revised Model

<table>
<thead>
<tr>
<th></th>
<th>NFI</th>
<th>NNFI</th>
<th>IFI</th>
<th>RFI</th>
<th>P-Values (RMSEA &lt; 0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Model</td>
<td>.93</td>
<td>.94</td>
<td>.95</td>
<td>.92</td>
<td>.000</td>
</tr>
<tr>
<td>Revised Model</td>
<td>.94</td>
<td>.95</td>
<td>.96</td>
<td>.93</td>
<td>.00498</td>
</tr>
</tbody>
</table>

According to Bowen and Guo (2011), researchers frequently revise CFA to improve the fit of the model trough allowing correlated errors. This is done based on modification indices in the output provided by SEM software, which show the expected change in the values of Chi-square if a certain parameter is specified to be free in the model under study. When the researcher correlates measurements error, he assumes that part of their covariation is a consequence of another source that is not related to the shared influence of the latent construct (Brown & Moore, 2012).

According to Garver and Mentzer (1999), modification indices with substantial values (> 7.88), which result in significant improvement in the goodness of the fit of the model, may need to be taken into account when evaluating the measurement model. However, there is a consensus in SEM literature that suggestions of error covariance need to be followed with cautious. When error covariance is allowed, theoretical justification need to be provided. The reason is that models with a poor fit may attain good fit if a researcher free many parameters.
Brown (2013, p. 261), identified many sources that may justify the specification of correlated errors that include “observer ratings, questionnaires, reversed or similarly worded test items, or differential susceptibility to other influences such as response set, demand characteristics, acquiescence, reading difficulty or social desirability.” Campbell-Sills and Brown (2005) maintain using different modes of administration can be a source of systematic error that need to be specified in the model. Moretz and McKay (2008) indicates self-reported measures tend to be correlated in SEM research.

In the current study, the model had already achieve an acceptable fit. However, the modification indices suggest freeing a number of measurement error covariances. I found only three parameters that can be justified. Two of these parameters involve covariance between EplorWay and ContResu with LedrSupr. The survey of this study was a self-administered questionnaire that was distributed and collected by the researcher himself in most of the organizations. However, in some organizations, officials have requested to distribute and collect the questionnaires by themselves. This in turn, may have resulted in providing socially acceptable response, in particular to the question of LedrSupr. The third parameter is between CoopColb and SolvProl because self-reported measures tend to be correlated.

Lisrel software performs a test of close fit. The null hypothesis in this test is RMSEA < 0.05. A \( p \)-value that is greater equal or greater than .05 indicate the model has a close fit (Wan, 2002). The P-Value for Test of Close Fit was obtained for the final model was .08 suggesting the model has improved its fit to data. This closeness in fit can be visualized in Figure 6 that shows Qplot of standardized residuals. This graphical display plot the normal quantiles against standardized residuals. When the residuals lie roughly along the diagonal, it is believed that the
model has an acceptable fit. The residuals in Figure 6 approximately lie on the diagonal indicating the model has a good fit.

Figure 6: Qplot of Standardized Residuals

The final measurement model yielded $\chi^2 (56) = 132.87$ which means the ration of $\chi^2 / df$ is 2.35. This value is below stringent recommended value (i.e. < 3). CFI = 0.95, RMSEA is .06, IFI is .97 and the GFI is .98, PNFI .66 and PGFI .62. NFI yielded .95 and NNFI is .96. The final measurement model is depicted in Figure 7.
OL = organizational learning; SE = self-efficacy; AGA = agility; IMPRO = tendency towards improvisation

Table 13 shows comparison between selective fit indices of the initial and the final models used in this study. The figures clearly shows the superiority of the final model because it has closer fit to the data.

Table 13: Comparison of the Original and Final Models

<table>
<thead>
<tr>
<th>Selected fit indices</th>
<th>Original Model</th>
<th>Final Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root Mean Square Error of Approximation (RMSEA)</td>
<td>0.09</td>
<td>0.06</td>
</tr>
<tr>
<td>P-Value for Test of Close Fit (RMSEA &lt; 0.05)</td>
<td>0.000</td>
<td>0.08</td>
</tr>
<tr>
<td>Normed Fit Index (NFI)</td>
<td>0.93</td>
<td>0.95</td>
</tr>
<tr>
<td>Non-Normed Fit Index (NNFI)</td>
<td>0.94</td>
<td>0.96</td>
</tr>
<tr>
<td>Comparative Fit Index (CFI)</td>
<td>0.95</td>
<td>0.97</td>
</tr>
<tr>
<td>Incremental Fit Index (IFI)</td>
<td>0.95</td>
<td>0.97</td>
</tr>
<tr>
<td>Relative Fit Index (RFI)</td>
<td>0.92</td>
<td>0.94</td>
</tr>
<tr>
<td>Critical N (CN)</td>
<td>136.55</td>
<td>207.87</td>
</tr>
<tr>
<td>Root Mean Square Residual (RMR)</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>Goodness of Fit Index (GFI)</td>
<td>0.98</td>
<td>0.98</td>
</tr>
<tr>
<td>Adjusted Goodness of Fit Index (AGFI)</td>
<td>0.97</td>
<td>0.98</td>
</tr>
</tbody>
</table>
When the model obtains an acceptable fit, it is important to assess the direction, magnitude and the significance of the parameter estimates between manifests and latent constructs (Garver & Mentzer, 1999). Table 14 shows the properties of the measurement model used and indicates that all the signs of parameter estimates are consistent with the theory. The magnitude of the parameters are evaluated by the size of standardized parameter estimates. Chen and Chang (2014) recommend dropping items that have loadings less than .50. Hulland, Shou, and Lam recommend .70 as a threshold to standardized parameter estimates of the measurement model to warrant construct unidimensionality.

Garver and Mentzer (1999) define unidimensionality as the degree to which an item represent only one underlying latent variable. They stress that unidimensionality has been recognized as one of the most important postulations of measurement theory. All standardized parameter estimates in Table 14 are greater than .70 suggesting unidimensionality is achieved for all constructs. The significance of the parameter estimates is concerned whether the parameters are statistically significant from zero or not by finding out the critical ratio (t-value). t-value is calculated by dividing the value of each unstandardized parameter by it standard error.

If t-value exceeds 1.96, it indicates that the corresponding parameter estimate is statistically significant from zero at the 0.05 level, which leads to reject the null hypothesis, i.e. the parameter is not different from zero. If t-value greater than 2.56, it indicates that the corresponding parameter estimate is significant at the 0.01 level. According to Garver and Mentzer (1999), all parameter estimates should be significant at the 0.05 level meaning t-values
should exceed 1.96. The results in Table 14 indicates that t-values for all free parameters were statistically significant (p < .01).

Table 14 : The Properties of the Measurement Model.

<table>
<thead>
<tr>
<th>Path</th>
<th>Standardized Estimate</th>
<th>Unstandardized Estimate</th>
<th>Standard Error</th>
<th>Critical Ratio</th>
<th>P-Value</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>AligLevl ← OL</td>
<td>.80</td>
<td>0.89</td>
<td>.05</td>
<td>15.53</td>
<td>.000**</td>
<td>.638</td>
</tr>
<tr>
<td>EplorWay ← OL</td>
<td>.85</td>
<td>0.95</td>
<td>.07</td>
<td>13.32</td>
<td>.000**</td>
<td>.715</td>
</tr>
<tr>
<td>ContResu ← OL</td>
<td>.70</td>
<td>0.78</td>
<td>.06</td>
<td>11.95</td>
<td>.000**</td>
<td>.484</td>
</tr>
<tr>
<td>LedrSupr ← OL</td>
<td>.89</td>
<td>( \lambda ) set to 1</td>
<td>*</td>
<td>*</td>
<td>.000**</td>
<td>.793</td>
</tr>
<tr>
<td>SolvProl ← SE</td>
<td>.87</td>
<td>1.10</td>
<td>.18</td>
<td>6.08</td>
<td>.000**</td>
<td>.753</td>
</tr>
<tr>
<td>CoopColb ← SE</td>
<td>.78</td>
<td>0.98</td>
<td>.17</td>
<td>5.79</td>
<td>.000**</td>
<td>.604</td>
</tr>
<tr>
<td>DealEfec ← SE</td>
<td>.79</td>
<td>( \lambda ) set to 1</td>
<td>*</td>
<td>*</td>
<td>.000**</td>
<td>.622</td>
</tr>
<tr>
<td>SensAmbg ← AGA</td>
<td>.73</td>
<td>( \lambda ) set to 1</td>
<td>*</td>
<td>*</td>
<td>.000**</td>
<td>.526</td>
</tr>
<tr>
<td>QukDploy ← AGA</td>
<td>.79</td>
<td>1.08</td>
<td>.08</td>
<td>12.41</td>
<td>.000**</td>
<td>.621</td>
</tr>
<tr>
<td>TakeAdvn ← AGA</td>
<td>.87</td>
<td>1.20</td>
<td>.09</td>
<td>12.95</td>
<td>.000**</td>
<td>.760</td>
</tr>
<tr>
<td>ExprUnpl ← IMPRO</td>
<td>.85</td>
<td>( \lambda ) set to 1</td>
<td>*</td>
<td>*</td>
<td>.000**</td>
<td>.727</td>
</tr>
<tr>
<td>NewActiv ← IMPRO</td>
<td>.72</td>
<td>0.84</td>
<td>.07</td>
<td>10.66</td>
<td>.000**</td>
<td>.519</td>
</tr>
<tr>
<td>IssueOrdr ← IMPRO</td>
<td>.75</td>
<td>0.87</td>
<td>.08</td>
<td>10.39</td>
<td>.000**</td>
<td>.555</td>
</tr>
</tbody>
</table>

*Standard error and t-value are not estimated for reference manifests; ** p < .01

Hoyle (1995, p. 9) states the difference between standardized and un-standardized parameters:

Unstandardized parameter estimates retain scaling information of variables and can only be interpreted with reference to the scales of the variables. Unstandardized estimates indicate the number of units change in the dependent variable per unit change in the independent variable when all remaining independent variables are at their mean. Standardized parameter estimates are transformations of unstandardized estimates that remove scaling and can be used for informal comparisons of parameters throughout the model. Standardized estimates index the number of standard deviations change in the dependent variable per standard deviation change in the independent variable when all remaining independent variables at zero.
The interpretation of unstandardized parameters is similar to interpretations of unstandardized regression coefficients. For example, the interpretation of the first equation is that changing OL by one unit will result in a .897 unit increase in AligLevl. In fact, there is no agreement among SEM methodologists on whether to use standardized or un-standardized parameters (Lomax, 2007). For example, Brown (2012) stresses the tendency of researchers to report un-standardized parameters because the analysis is based on un-standardized values. Consequently, reporting standardized parameters can be misleading because the nature of the relation between the variables is potentially masked.

In contrast, Diamantopoulos and Siguaw, (2000) maintain information conveyed by standardized parameters is easier to understand because it is based on correlation not covariance. In addition, they assert using standardized parameters helps to determine the relative contribution for each construct to the other. Moreover, Diamantopoulos and Siguaw (2000) argue standardization enables observing improper estimates straightforwardly. For instance, the correlation that is greater than 1.00 is easier to spot than unreasonable covariances. However, Diamantopoulos and Siguaw (2000) acknowledge standardization cause the loss of natural meaning of metrics and standardized values cannot be used when there is more than one sample.

The last column in Table 14 is squared multiple correlations, $R^2$, which inform us about the reliability of indicators used in the model. $R^2$ value reveals the share of variance of a manifest variable that is explained by the latent construct. In other words, it reflects to what extent the manifest variables is free from error. Joreskog and Sorbom (1993, p. 20) state, “this is a measure of the strength of the linear relationship. In this context, $R^2$ is usually interpreted as
the reliability of the observed measure on the left." A high value indicates the corresponding indicator is strongly related to the latent construct to which the indicator is specified. Consequently, the indicator is an appropriate manifest to represent the corresponding latent construct (Diamantopoulos & Siguaw, 2000).

For example, the squared multiple correlations for LedrSupr is .793. This suggests that about 80 percent of the variance in the manifest is due to the latent construct OL. The remaining is because of measurement error. Scholars have recommended deleting indicators with values below .40 (e.g. Hulland, 1999). The R² values in Table 14 are greater than .50 (except ContResu with value 0.48) suggesting the indicators achieved reasonable level in measuring the latent constructs in the model.

According to Garver and Mentzer (1999), when the scale of each construct achieve unidimensionality and reliability levels, the researcher can examine convergent and discriminant validity. The following section discusses the issue of construct validity.

**Construct validity**

The composite reliability values need to be calculated manually via the formula below because SEM software do not calculate them.

\[ \rho_c = \frac{(\sum \lambda_i)^2}{[(\sum \lambda_i)^2 + \sum(\theta)]} \]

Where \( \rho_c \) is the composite reliability, \( \lambda \) is the indicator loading, \( \theta \) is the indicator error variances (i.e. variances of the \( \delta \)'s or \( \epsilon \)'s) \( \sum \) = summation over the indicators of the latent variable. The information used in this formula should be taken from completely standardized solutions.
Researchers have suggested different values as a threshold for the accepted level of composite reliability (Diamantopoulos & Siguaw, 2000).

For example, while Bagozzi and Yi (1988), recommended .60 to be an acceptable value. Hair et al (2010) and Chin (1998) believe .70 is the appropriate value for composite reliability. All the composite reliability values of all latent constructs in Table 15 exceeded .80 suggesting that all the manifests in this study are measuring their assigned latent constructs. Thus, the constructs have high relatabilities and adequate internal consistency. I also provided the values of Cronbach’s Alpha for all latent constructs.

AVE is also need to be calculated manually and the formula needed is almost identical to the one used to calculate the composite reliability with slight change (Diamantopoulos & Siguaw, 2000).

\[
\rho_v = \frac{(\sum \lambda_i^2)}{[\sum \lambda_i^2 + \sum(\theta)]}
\]

According to Fornell and Larcker (1981), who are the developer of this scale, AVE should be greater than 0.50. AVE values that are less than .50 suggest that the share amount of variances (50% or more depending on the exact value) are accounted by the measurement error accounts. Hence, concerns should rise regarding the appropriateness of the manifests or the latent construct itself (Diamantopoulos & Siguaw, 2000). Table 15 shows the values of AVE for all latent constructs are greater than .60 suggesting that a reasonable amount of variances in the manifests are captured by corresponding latent constructs.

There are two approaches are commonly used to assess discriminate validity be SEM methodologists. The first is to examine latent intercorrelations and a correlation coefficient that is higher than .80 may indicate that the constructs with high correlation are not distinct and
they might represent the same phenomena (Bagozzi et al. 1991). The second way to ensure discriminate validity is that the square root of AVE for a specific latent construct should be greater than its correlation with all other constructs (Fornell & Larcker, 1981) which means that latent construct items share variance with each other more than with other constructs (Lu, 2007).

Table 15 shows construct intercorrelations and the square root of AVE and no correlation between pairs of latent construct exceed .80. Further, the square root of AVE for each latent construct on the diagonal in bold is greater than its correlation with all other construct on the off diagonal, which reveal good evidence of discriminate validity. The evaluation of the measurement model showed good evidence of reliability and validity for the operationalization of all latent constructs. The next section will assess the structural portion of the model.

Table 15: Cronbach’s Alpha, Construct reliability, AVE, the Square Root of AVE and Correlations between Constructs.

<table>
<thead>
<tr>
<th></th>
<th>Cronbach’s Alpha</th>
<th>CR</th>
<th>AVE</th>
<th>The square root of AVE and correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OL</td>
<td>SE</td>
<td>AGA</td>
</tr>
<tr>
<td>OL</td>
<td>.80</td>
<td>.86</td>
<td>.62</td>
<td>.78</td>
</tr>
<tr>
<td>SE</td>
<td>.80</td>
<td>.85</td>
<td>.66</td>
<td>.36</td>
</tr>
<tr>
<td>AGA</td>
<td>.81</td>
<td>.85</td>
<td>.64</td>
<td>.65</td>
</tr>
<tr>
<td>IMPORO</td>
<td>.76</td>
<td>.82</td>
<td>.60</td>
<td>.20</td>
</tr>
</tbody>
</table>

Evaluation of the structural Model

The generated output in the structural model did not reveal any warring. There was no improper solutions, such as having negative variance, correlations that are greater than ±1.0 or correlation or covariance matrices that are not positive-definite (i.e. matrices that are not able be inverted). According to Diamantopoulos and Siguaw (2006), having such situations will lead
to parameters that fall beyond a feasible range and their absence indicates a positive sign. One
important aspect need to be evaluated is to evaluate the statistical power of the structural
model. According to Diamantopoulos and Siguaw (2000), model assessment that ignores the
power analysis would be incomplete because it ignores the influence of the sample size on
model testing.

Bollen (1989) states “for large sample we face the question of whether a statistically
significant chi-square estimate of overall fit mean that serious specification error are present or
whether the test has excessively high power” (in Diamantopoulos & Siguaw, 2000, p. 94). A
frequently used strategy to evaluate power in structural models is that developed by
MacCallum, Browne, and Sugawara (1996). Based on various degrees of freedom and sample
size, MacCallum et al. (1996) provide table for power estimates for three levels: close, not a
close and exact fit. According to Diamantopoulos and Siguaw (2000), a power level of .80 meets
the needs of the majority of practical purposes. The power estimate for the model of this study
with 59 degree of freedom and sample size 304 would be 0.941 for exact fit and 0.960 for close
fit. Therefore, the power level of the model is certainly enough to detect serious
misspecifications.

The results of the fit measurements are reported in Table 13 show that all the values for
the fit indices are above their relative thresholds. The RMSEA is .06, which satisfies the
acceptable level and indicates the model has a fair fit to the data. Steiger (1990) and MacCallum
et al. (1996) urge to examine the confidence interval around the RMSEA to evaluate the
accuracy of the estimation of RMSEA. Rather than an estimate for a single point, 90 %
confidence interval for the RMSEA informs the researcher about the bounds within which 90%
of all possible random samples of RMSEA values will fall. Thus, the researcher will have far more information to assess the fit of the model (Byrne, 2009).

The absence of -90 percent- confidence interval for the RMSEA from Lisrel outputs mean that the computation of the confidence interval is not possible because the discrepancy between the observed matrix and predicted or implied matrix is so large (Diamantopoulos & Siguaw, 2000). When the confidence interval is provided, but is wide, Byrne (2009) indicates it would be not possible to determine accurately how the model fit the data, even if the value of RMSEA is small. This because the wide interval implies the value of RMSEA is not precise. In contrast, a narrow 90 % confidence interval suggests the value of RMSEA is precise and the model fits the data. The 90 % confidence interval for the RMSEA for the structural model range from .053 to .082 meaning 90% of all possible random samples of RMSEA values will fall between the values .53 and .82. Given that the value of RMSEA is .06, the estimation of RMSEA is precise and the model fits the data.

Finally, the standardized residuals matrix for the structural model in Table 16. According to Schumacker and Lomax (2010), examination of the standardized residuals matrix is useful for assessing the model fit because large residual values show where implied or hypothesized covariances or correlations are not properly accounted for by the structural model. Schumacker and Lomax (2010) point out that the values of standardized residuals matrix like z score and large values suggest a specific relationship is not well presented in the model. Residual values that exceed + 2.58 or – 2.58 are considered large and problematic (Byrne, 2009; Jöreskog & Sörbom, 1988). An examination of the matrix reveals that of 91 standardized residual values in
the matrix, only one fell outside aforementioned boundaries confirming the results of the fit indices that the model has an adequate fit level.

Table 16: Standardized Residuals Matrix

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AligLevl</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>EplorWay</td>
<td>-0.60</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>ContResu</td>
<td>2.07</td>
<td>-0.15</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>LedrSupr</td>
<td>0.92</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>SolvProl</td>
<td>-1.22</td>
<td>-0.49</td>
<td>-0.49</td>
<td>0.36</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>CoopColb</td>
<td>0.78</td>
<td>-0.72</td>
<td>-0.54</td>
<td>-0.21</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>DealEfec</td>
<td>-0.75</td>
<td>-0.67</td>
<td>-0.37</td>
<td>-0.24</td>
<td>-0.36</td>
<td>0.36</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SensAmbg</td>
<td>-1.49</td>
<td>0.68</td>
<td>-0.59</td>
<td>-0.20</td>
<td>-1.12</td>
<td>-0.61</td>
<td>-0.06</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>QukDploy</td>
<td>-0.54</td>
<td>0.32</td>
<td>-0.52</td>
<td>-0.40</td>
<td>2.03</td>
<td>0.09</td>
<td>-0.17</td>
<td>-0.33</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>TakeAdvn</td>
<td>-0.66</td>
<td>0.14</td>
<td>-0.25</td>
<td>-0.44</td>
<td>2.04</td>
<td>1.50</td>
<td>2.05</td>
<td>1.23</td>
<td>-0.96</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>ExprUnpl</td>
<td>0.52</td>
<td>0.90</td>
<td>-0.87</td>
<td>-1.04</td>
<td>-0.56</td>
<td>-0.54</td>
<td>1.97</td>
<td>-0.19</td>
<td>0.00</td>
<td>-0.63</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>NewActiv</td>
<td>2.12</td>
<td>1.54</td>
<td>1.21</td>
<td>0.65</td>
<td>1.30</td>
<td>-0.22</td>
<td>1.41</td>
<td>-1.07</td>
<td>0.86</td>
<td>-0.77</td>
<td>-1.46</td>
<td>0.00</td>
</tr>
<tr>
<td>13</td>
<td>IsueOrdr</td>
<td>-1.14</td>
<td>-0.91</td>
<td>-1.79</td>
<td>-1.46</td>
<td>-0.66</td>
<td>-2.13</td>
<td>-0.72</td>
<td>2.65</td>
<td>0.78</td>
<td>-1.55</td>
<td>1.96</td>
<td>-0.51</td>
</tr>
</tbody>
</table>

This chapter explained how the measurement model was developed and evaluated. It also evaluated the generated output in the structural model, which showed no warning signs.

The next chapter represents the results of the structural model.
CHAPTER 7

FINDINGS

This chapter analyzes the direction and size of path coefficients in order to find out if the relationship of interest are consistent with the proposed hypothesis or not. The analysis of each postulated hypothesis is reported. A graphical representation of the result of the hypothesis examination depicted in Figure 8 helps to visualize the relationships among latent constructs. Figure 8 illustrates that three of the five hypnotized paths are statistically significant at .01 level.

Figure 8: Hypothesis Results

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Insignificant path P

Statistically path P < .01
Hypothesis Testing and Findings

Hypothesis 1: Organizational learning is positively related to individuals’ self-efficacy.

The path between OL and self-efficacy was positive and statistically significant at the $p < 0.01$. Thus, the hypothesized relationship was supported by the data. The interpretation of the relation can be obtained from the information in Table 17. An increase of one standard deviation in the latent construct OL was associated with a .41 standard deviation increase in the latent construct self-efficacy. About 17% of the variance in self-efficacy was due to or account for by the latent construct OL ($R^2 = 0.17$).

Table 17: The Unstandardized and Standardized Path Coefficients for the Structural Model

<table>
<thead>
<tr>
<th>Path</th>
<th>Standardized Estimate</th>
<th>Un-standardized Estimate</th>
<th>Standard Error</th>
<th>Critical Ratio</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE ← OL</td>
<td>0.41</td>
<td>0.47</td>
<td>0.11</td>
<td>4.32</td>
<td>.000**</td>
</tr>
<tr>
<td>IMPRO ← SE</td>
<td>0.02</td>
<td>0.02</td>
<td>0.09</td>
<td>0.22</td>
<td>.820</td>
</tr>
<tr>
<td>IMPRO ← OL</td>
<td>-0.05</td>
<td>-0.07</td>
<td>0.15</td>
<td>-0.43</td>
<td>.666</td>
</tr>
<tr>
<td>AGA ← OL</td>
<td>0.69</td>
<td>0.81</td>
<td>0.10</td>
<td>7.96</td>
<td>.000**</td>
</tr>
<tr>
<td>IMPRO ← AGA</td>
<td>0.37</td>
<td>0.39</td>
<td>0.12</td>
<td>3.01</td>
<td>.003**</td>
</tr>
</tbody>
</table>

** $p < 0.01$

This is consistent with the theoretical and statistical findings in the aforementioned studies. A learning culture leads to various organizational changes among which is self-efficacy (Sabri & Sabri-Matanagh, 2013). In fact, Gupta, Jain and Dhar (2007) maintain that self-efficacy is one of three possible outcomes of OL in organizations. Elements of learning such as openness, tolerance to errors, encouragement and developing the skills of the members of organizations have been found consistently in various disciplines to have positive impact on reducing anxiety and having higher levels of self-efficacy.
Furthermore, there is an acceptance that OL provides the right conditions that facilitate personal growth and development among people across organizations in different contexts. In fact, at the heart of the concept of OL is the idea that organizations progress and flourish because of personal development of individuals in organizations (Bowyer & Martinelli, 2004). Self-efficacy is a key resource in personal development (Sun, 2012; Cervone, Artistico & Berry, 2006).

Hypothesis 2: individuals’ self-efficacy is positively related to their tendency to improvise.

The path between self-efficacy and tendency to improvisation was positive but not significant. With a $\beta = .41$ and $p$ value of 0.820, the postulated hypothesis is not supported by the data. The result provides support to the view that self-efficacy is not necessarily linked to individuals’ performance or at least support the view the pattern of changes in this relationship suggests that the relation “does not necessarily proceed in a monotonic, deviation-amplifying spiral” (Shea & Howell, 2000, p. 791).

However, this finding should be taken with extreme cautious because I found while conducting the research that the nonprofit sector in Saudi Arabia has some restrictions that may not exist in other parts of the world. Salloom (2011) in his book Innocent Victims In The Global War On Terror points out that NPOs in Saudi Arabia have become under stringent rules after 9/11 attack because of the pressure, in particular from the US, due to the allegations against many of NPOs in Saudi Arabia of supporting terrorism.

Werner and DeSimone (2011) stress that it is important to understand the elements that affect human resource development when attempting to change their behavior of employees. According to the authors, there are two sets of factors. External factors, such as
economic and governmental issues, and internal factors such as motivation. In this study, it seems that the environmental and internal factors not incongruence with each other because employees may enjoy high levels of self-efficacy, but they do not want to run the risk of breaking rules. Therefore, studies that are more sophisticated may be needed to understand the relationship between individuals’ self-efficacy and their tendency to improvise.

Hypothesis 3: Organizational learning is positively related to individuals’ tendency to improvise.

The path coefficient between OL and tendency to improvisation was negative (With $\beta = -0.06$ and $p$ value of 0.666) but not statistically significant. Thus, the hypothesis is not supported by the data. The non-significance of the relationship between OL and tendency towards improvisation can be attributed to two reasons. First, “there is often a lag between learning initiatives and results so that the snapshot taken does not capture changes still in incubation stages” (Marsick & Watkins, 2003, p. 138).

Similarly, Lof (2011, p. 67) in Resilience in social-ecological systems: the role of learning and education asserts “learning is a complex and nonlinear process.” Given the snapshot nature of the study, the direct effect of learning on the tendency of individuals to improvise may not be possible to trace or to capture in a single study. Second, the insignificance of the relationship may be due to statistical reasons. The ADF estimators, as it has been mention above, need sample size more than 1000. As a result, the absence of direct relationship may be due to sample limitations.

Hypothesis 4: Organizational learning is positively related to individuals’ agility in NPOs.

The path between OL and agility was positive and statistically significant at $p < 0.01$. Therefore, the hypothesized relationship was supported by the data. The statistics in Table 17
show that an increase of one standard deviation in the latent construct OL was associated with a .69 standard deviation increase in the latent construct agility. About 47% of the variance in agility was due to or accounted for by the latent construct OL ($R^2 = 47$). This relationship was the strongest direct relationship in the model.

The significance of the final hypothesis is in harmony with the assertions of many scholars that OL has a significant impact on the agility of staff in the workplace. Risk-taking, flexibility, open information exchange, teamwork, cooperation, and personal accountability are all essential factors for employees’ agility. These elements have been found consistently key features for developing learning organizations. Further, the concept of learning and agile organizations share an important feature, which is the emphasis on the continuous adaptability to changing circumstances (Dyer & Shafer, 1998).

According to Moore (2012), leading scholars in the fields of management of change and management such as John Kotter and Henry Mintzberg agree organizations must manage both change and continuity. This is because the “traditional hierarchies and managerial processes can still do very well. What they do not do well is identify the most important hazards and opportunities early enough, formulate creative strategic initiatives nimbly enough, and implement them fast enough.” (John Kotter in Moore, 2012)

To balance this dilemma, John Kotter argues that “the solution is a second operating system, devoted to the design and implementation of strategy that uses an agile, network like structure and a very different set of processes.” His explanation of these processes clearly shows the link between agility and learning elements that underlie by scholars of OL. According to him, “the new operating system continually assesses the business, the industry,
and the organization, and reacts with greater agility, speed, and creativity than the existing one.” (John Kotter in Moore, 2012). This explanation is just another rephrase of the concept of double loop learning.

In fact, these views are consistent with the opinion of some scholars in the field of EM. For example, Harrald (2006) points out that for more than 30 years, the EM system in the US has been improving its structure. This effort culminated in the National Response System that was seen as a failure in the wake of Hurricane Katrina. Over the same period, disaster researchers in social science and other filed have been supporting the nonstructural elements such as improvisation, adaptability, and creativity. According to him, “these two streams of thought are not in opposition, but form orthogonal dimensions of discipline and agility that must both be achieved” (Harrald, 2006, p. 256).

Research carried out by Korn/Ferry International on what characteristics distinguish individuals who learn agility successfully clearly shows that people can only learn agility in an organizational context where OL is deeply embedded. The research was conducted in three phases using a database of 2,242 leaders and managers from 25 organizations in four worldwide geographical regions. A subsample of 1,245 managers, who are classified as “high learning agile”, was then, drown out. The research states in its conclusion:

*People who are learning agile: seek out experiences to learn from; enjoy complex problems and challenges associated with new experiences because they have an interest in making sense of them; perform better because they incorporate new skills into their repertoire. A person who is learning agile has more lessons, more tools, and more solutions to draw on when faced with new business challenges.* (Hallenbeck, Swisher & Orr, 2011, p. 2).
Hypothesis 5: Individuals’ agility is positively related to individuals’ tendency to improvise.

The path coefficient between agility and individuals’ tendency to improvise was positive and statistically significant at the $p < 0.01$. An increase of one standard deviation in the latent construct agility was associated with a .37 standard deviation increase in the latent construct individuals’ tendency to improvise. Therefore, the hypothesized relationship was supported by the data and there is a strong association between the level of individuals’ agility and their tendency to improvise.

This result confirms the important role of agility that has been stressed by the majority of EM scholars that agile organizations will tend to improvise more that those less agile because the mental and the physical readiness of people in these organizations. This indicates that improvisation is an activity that can be intentionally or deliberately influenced by the organization itself. Indeed, recent efforts in disaster studies support the last point. For example, the notion of spontaneous planning that was developed by McEntire, Kelly, Kendra, and Long (2013) is closely related, if not the same, to improvisation. McEntire et al. (2013, p. 2) define spontaneous planning as:

*Spontaneous planning is not equivalent to routine planning or emergent improvisation. Spontaneous planning is distinct from normal emergency planning because it does not take place before an emergency or disaster occurs. While spontaneous planning is indeed an anticipatory activity (like the development of emergency operations plans), it is only witnessed [immediately before or] after an incident occurs and takes into account actual hazards and unfolding disaster consequences. Spontaneous planning is, at times, based on or expands from existing planning documents, but it may also depart from agreed-upon procedures and result in completely unanticipated post-disaster activities.*
It is apparent the concept preserves that improvisation is a radical departure from the status queue. However, it is not clear how this concept differs from improvisation if improvisation is defined as “a mixture of the pre composed and the spontaneous” (Weick, 1998, p. 551). If so, it is not evident what distinguish this planning from improvisation during disaster. Further, the concept assumes that modification of plan occurs immediately before or after an incident occurs. Does this concept apply only for disaster with slow-onset disasters because fast-onset disasters, such as terrorist attacks, have not time to do this type of planning?

Moreover, if this type of planning is different from planning and improvisation, what makes it different from a traditional plan modification, and if spontaneous planning is concerning changing strategy, how this concept is different from old management themes such the garbage-can theory (Cohen, March & Olsen, 1972), “spontaneous centrality” (Argyris, 1972) or “deliberate and emergent strategy” (Mintzberg & Waters, 1985). Whether it is different from improvisation or not, McEntire (2014) states that this activity has an overlapping relation with improvisation and provide several actions that are required to be included in this type of planning.

A close examination of these activities, such as assessing environmental cues and coordinating activities, support the view of this paper that the concept of improvisation can be stimulated within the organizational context by increasing the level of agility among individuals. Although this paper does not necessarily contends this behavior is a type of planning or can be planned, it does maintains this type of human behavior can be mediated or facilitated by
providing appropriate culture and organizational structure. The direct and indirect standardized effects among the latent constructs are shown in Table 18.

Table 18: The Direct and Indirect Standardized Effects among the Latent Constructs.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Effect</th>
<th>self-efficacy</th>
<th>Agility</th>
<th>Tendency towards improvisation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organizational Learning</strong></td>
<td>Direct</td>
<td>.41</td>
<td>.69</td>
<td>-.5</td>
</tr>
<tr>
<td></td>
<td>Indirect</td>
<td>--</td>
<td>--</td>
<td>.26</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>.41</td>
<td>.69</td>
<td>.21</td>
</tr>
<tr>
<td></td>
<td>p-value (total)</td>
<td></td>
<td></td>
<td>.00**</td>
</tr>
<tr>
<td>self-efficacy</td>
<td>Direct</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indirect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>p-value (total)</td>
<td></td>
<td></td>
<td>.22</td>
</tr>
<tr>
<td>Agility</td>
<td>Direct</td>
<td></td>
<td></td>
<td>.37</td>
</tr>
<tr>
<td></td>
<td>Indirect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td>.37</td>
</tr>
<tr>
<td></td>
<td>p-value (total)</td>
<td></td>
<td></td>
<td>.00**</td>
</tr>
</tbody>
</table>

**P < .01

In this chapter, the findings of the findings of the postulated hypothesis were discussed. The following chapter will highlight the contributions of these findings to the field of EM. This will be addressed by underlining how these results contributes to the theory of EM and how professionals in the filed can benefit from these findings. In addition, the final chapter identifies the limitations of this study. Finally, possible areas of research that can be pinpointed based on the findings the current study are suggested.
CHAPTER 8
CONCLUSION

The dissertation was set out to examine what influence the tendency towards improvisation among individuals in NPOs by studying possible mediating effects. The study has sought to explore whether internal organizational behavior and practices can result in an increase in the level of tendency towards improvisation among individuals in organizational context. Although there are many studies that focus on learning processes in the field of EM, these studies tend to focus on learning from a macro perspective and in a retrospective manner and use a qualitative method. Beside, despite the contributions of the sociological perspective that has dominated the field of EM, their viewpoints tend to be broad in term of the managerial tools and techniques provided to practitioners.

This orientation, in turn, may have led to emphasizing the importance of the external context at the expense of internal organizational behavior. This desertion fills the gap in literature by conducting an empirical study that focus on the ongoing learning process and practices in organizational settings. The study sought to answer the following questions:

1. What are the relations between OL and individuals’ self-efficacy, agility and tendency to improvisation in NPOs?
2. Does self-efficacy have positive impact on the tendency of individuals to improvise in NPOs?
3. Does individuals’ agility influence their tendency to improvise during disasters in NPOs?

OL theory served as the theoretical foundation that guided the answers to the research questions. OL theory is powerful theory because it is characterized by internal and external
emphasis. For example, Sinkula, Baker and Noordewier, (1997) indicate that most theories of learning manifest itself eventually in internal and external actions. Consequently, applying this concept will inform officials in disaster related organizations about important internal and external elements that should be taken into consideration.

Furthermore, Scholars of EM have stressed the importance of interdisciplinary research (McEntire, 2007). This particularly important when searching for the best methods and mechanisms of learning because EM heavily capitalize on the domain of organizational knowledge. OL theory is one of theories that can serve as the glues between various disciplines to exchange experiences of the appropriate methods and mechanisms over a variety of topics such as learning, decision-making process, leadership style and organizational process and structure.

The empirical study was conducted in three cities in Saudi Arabia: Makkah, Jeddah and Medina. These cities are located in the western area of Saudi Arabia. The unit of analysis in this study was individuals in NPOs in these three cities. Makkah, Jeddah and Medina was though to be appropriate for studying the tendency of individuals to improvise during emergency times because these cities were exposed to a series of natural hazards in the last five years.

In addition, Makkah and Madinah are the holy cities for all Muslims across the world and millions of Muslims come every year to perform religious duties that result in massive occasions and creates an emergency environment around the year. SEM was the statistical method used to evaluate the significance of the relationships among the latent constructs of OL, self-efficacy, agility and tendency of employees of NPOs to improvise. All fit indices exceeded the suggested thresholds indicating a good fit of the model to data.
With regard to the first question, the study found that the association between OL and individuals’ self-efficacy and agility were significant. The findings of this study confirm the strong links found in literature between OL and three out of four sources of self-efficacy identified by Bandura (1977). OL can enhance individual knowledge and insights as well as changes in habits through providing individuals with knowledge and skills essential for positive change. In addition, culture of high tolerance of mistakes, active in developing innovations in-house, dialogue and communication, openness and knowledge sharing that are essential for increasing the level of self-efficacy in organizational settings are stressed by almost all of OL theories.

Likewise, OL was significantly related to individuals’ agility. Literature indicate that learning behavior is critical for workforce agility. In addition, OL places far less emphasis on control, routines and bureaucratization. Organizations characterized by a high level of learning are less likely to develop internal barriers, such as risk-averse cultures, silo-based information and low decision-making that stall organizational agility. However, the study found no significant direct relationship between OL and individuals’ tendency to improvisation in NPOs.

The relationship examined in the second question was also not significant. Self-efficacy has no impact on the tendency of individuals to improvise in NPOs. This ran against the postulated hypothesis. The literature on the relationship between self-efficacy and performance has two main opposing views. While the first view maintains self-efficacy has no impact on performance, the second view asserts performance influenced by the level of self-efficacy. The findings of this study provide support for the first view.
In contrast, empirical evidence suggests strong association in the third question. The relationship between individuals’ agility was strongly related to the tendency to improvise during disasters in NPOs. This result fall within the main stream of literature that considers agility as an essential prerequisite for improvisation.

Contributions

Although this paper gave a broad analysis at conceptual level, this paper provides many theoretical and practical contributions. This section underlines the contributions of this study to the field of EM at both levels.

1- Theoretical Contributions

Concerning theoretical side, it emphasizes the role of human dimension in EM. Researchers have often stressed the need for agility, innovation and improvisation. Yet, despite some exceptions (see for example, Clarke, 1999; Vaughan, 1999; Clarke & Perrow, 1996), EM researchers often emphasize the obstacles and issues that hinder agility and improvisation from a macro perspective. For example, scholars have frequently criticize the negative role of the federal government because it immersed FEMA in multiple layers of bureaucracy after the creation of the U.S. Department of Homeland Security. In addition, scholars have continually called for a decentralized decision-making process, more involvement of local communities and coordination, cooperation.

However, the human side of organizational agility has been quite neglected. Part of this negligence may be traced back to the origin of EM that influenced by the military style of management that dehumanizes people. In addition, EM is mainly provided through a collective effort. As a result, the emphasis is concentrated on the rules and policies that regulate these
collective efforts. Although this tendency is understandable, the theory of EM needs to recognize the role of human elements in the way organizations work.

Moreover, despite the extensive literature that examine how employees in disaster-related organizations are prepared to respond to disasters in term of planning, resources and training and so on, few studies, if any, attempt to investigate preparedness from the psychological viewpoint. This paper introduced the concept of self-efficacy in disaster studies by attempting to evaluate how self-efficacy of workers in NPOs is related to OL and influences their tendency to improvise during disasters.

This is important because preparedness for disasters is not limited to logistics and physical activities, but also involves processes such as concerns, anticipations, recognition, arousal, thinking, feeling, intentions and management of one’s thoughts, feelings and actions (Reser & Morrissey, 2009). Although the findings do not show a significant relationship between the concept and improvisations, this result should not consider as a not questionable. More research is need because of stringent political situations within which NPOs work in Saudia Arabia. In addition, the impacts of self-efficacy on behaviors of people, other than improvisation, in organizational context is well known. For example, self-efficacy has been considered as a mean predictor of motivation. Therefore, more studies are important to understand the influences of self-efficacy.

Most important is that this study extends the scope of existing literature on improvisation by conducting an imperial study. Most studies in the field of EM that approach themes such as improvisation and agility are qualitative studies. Although the majority of scholars in the field have stressed the importance of these capacities for effective disaster
response, researchers have rarely examined these concepts empirically. Empirical studies are important to develop an undressing of improvisation theory because it verifies factors that influence the occurrence of improvisation.

2- Practical Contributions

The results of this paper support the existence mediational effect of agility between OL and tendency towards improvisation. Vera and Crossan (2005), maintain that a common misunderstanding about improvisation that has hampered managers’ understanding of how to develop the improvisational skill is overemphasizing the spontaneous feature of improvisation. This may explain why many professionals tend to consider improvisational or unplanned and emergent activities as “disruptive behavior.” By verifying empirically that OL has an indirect effect tendency towards improvisation, this dissertation shows that improvisation can be facelifted by important conditions that can be created intentionally by managers.

Accordingly, it shows that improvisation is a behavior that can be mediated and influenced not only by policies and procedures at the macro levels (i.e. federal, state and local levels), but also at organizational level. As a consequence, this paper informs official that employees’ capacities and readiness of learning can be supported and fostered by organizations themselves through organizational practices and methods of which they are responsible.

Practitioners in the field of EM can benefit from the current results to develop and incorporate specific schemes and strategies for learning in daily practices to enhance capacities of employees. Beside, assessing the orientation to learning in their organizations can revel particular hindering organizational structures that restrict organizational flexibility and agility.
This does mean that improvisation can be deliberately planned or articulated, but the readiness of individuals for improvisation can be facilitated and accelerated by developing and creating appropriate conditions such as organizational design and patterns of communications.

Limitations

The purpose of this study is to examine the influence of OL on the tendency of improvisation among individuals in the organizational context by finding direct and indirect relationships. This paper does not propose this model of learning is the sole factor or the most important elements that explain the tendency of improvisation. However, this study does maintain that learning is a key element in, at least, increasing the level of individuals’ agility, and in turn, tendency to improvisation for individuals in organizations presented in this study. In addition, the paper does not argue that the level of individuals’ tendency towards improvisations will necessarily lead individuals to improvise more than those with low levels of tendency towards improvisation. This is beyond the scope of this dissertation.

The findings of this analysis should be considered in light of the constraints of research. The sample used in this study represent NPOs in the west area in Saudi Arabia. Hence, the findings of this study may be generalized only to organizations in this region. Similar claims are hardly can be generalized to NPOs working in other regions without further comparative studies. Consequently, the result of this study should not be assumed beyond the domain of this study. In addition, the SEM model used in this paper achieved good fit. However, the ADF estimators are problematic and can be more harm than good when the sample size is less than 1000 (Jöreskog & Sörbom, 1996; West et al. 1995). Thus, more studies with large samples
maybe are required to ensure the nature of the relationships among the construct examined in this study.

Another limitation is that related to the design of this study. The study used a cross sectional research design, which has its well-known disadvantage. Cross sectional studies provides only snapshots at one time and they do not provide rich picture. In fact, researchers must be more cautious about this disadvantage when studying OL because there is often lag between learning initiatives and their outcomes. Consequently, studies that take snapshots may not catch changes still in growth or have not completed their cycles (Marsick & Watkins, 2003). Biddle and Marlin (1987, p. 9) assert that SEM uses cross-sectional studies “in the best case associational and temporal.” Therefore, a statement about causations are hardly can be made. A longitudinal study will help to detect precisely changes in relationships identified in this study.

Future Research

This dissertation sets the stage for further studies. Following this research, a longitudinal study that examines the relation between individuals’ tendencies towards improvisations and the occurrence of improvisational action from these groups during disasters will be a major advancement in the direction of formulating improvisation theory. This is because it will show clearly that improvisation is an organizational facet or outcome that can be influenced by intellectual capital or human assets. In turn, this will open windows for the impacts of other soft dimensions, such as achievement, motivation, recognitions, on the occurrence of
improvisation because these elements have been found consistently critical for the performance of individuals in various organizational contexts.

Another direction of future research is to examine the influence of the technological revolution, which has transformed the nature of our lives and the way organizations work, on individual learning and their ability to improvise. This social reality (i.e. reliance on technology) massively dominates many features of the EM profession (Holdeman, 2014). However, its influence on individuals’ ability to improvise or job autonomy during disaster has not been well investigated and understood. Beside, how technology influences decision-making processes during disasters have not been examined and understood.

Despite of the contribution of the macro perspective that has been stressed by researchers of EM, developing a theory of improvisation need to examine other factors that trigger improvisations. In doing so, researchers must pay attention to internal as well as external elements. A great deal of this attention should be directed to the human dimension of the phenomena because improvisation is essentially a human behavior. Thus, elements and factors that may affect this behavior physically and psychologically must be studied.
APPENDIX A

SURVEY INSTRUMENT AND CONSENT LETTER
**Organizational learning questionnaire for NPOs**

**Survey research participation and informed consent**

1- Please tell us about your organization and your self

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[…….]</td>
<td>[…….]</td>
</tr>
</tbody>
</table>

The name of your organization

[……………………………]

<table>
<thead>
<tr>
<th>City</th>
<th>Mecca</th>
<th>Medina</th>
<th>Jeddah</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[…….]</td>
<td>[…….]</td>
<td>[…….]</td>
</tr>
</tbody>
</table>

Year established

[……………………………]

<table>
<thead>
<tr>
<th>Education</th>
<th>Below school</th>
<th>High school</th>
<th>Bachelor</th>
<th>Post graduate</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>[…….]</td>
<td>[…….]</td>
<td>[…….]</td>
<td>[…….]</td>
</tr>
</tbody>
</table>

Year in service

[……………………………]

Number of full-time staff

[……………………………]

Number of volunteers

[……………………………]

<table>
<thead>
<tr>
<th>Annual budget</th>
<th>1000-5000</th>
<th>50001-10000</th>
<th>100001-300000</th>
<th>3000001-500000</th>
<th>500000-1000000</th>
<th>&lt;1000000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[…….]</td>
<td>[…….]</td>
<td>[…….]</td>
<td>[…….]</td>
<td>[…….]</td>
<td>[…….]</td>
</tr>
</tbody>
</table>
2- Please indicate the degree of agreement or disagreement regarding organizational learning practices that fits the situation in your organization best

<table>
<thead>
<tr>
<th></th>
<th>1 Completely disagree</th>
<th>2 A little</th>
<th>3 Somewhat</th>
<th>4 Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My organization encourages people to think from a community perspective</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My organization works together with the outside community to meet mutual needs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My organization builds alignment of visions across different levels and work groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My organization encourages people to get answers from across the organization when solving problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In my organization, people openly discuss mistakes in order to learn from them</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In my organization, people give open and honest feedback to each other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In my organization, people are rewarded for exploring new ways of working</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My organization enables people to get needed information at any time quickly and easily</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My organization gives people control over the resources they need to accomplish their work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In my organization, leaders generally support requests for learning opportunities and training</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3- Please provide the most appropriate degree of your confidence to do tasks in the following statements:

<table>
<thead>
<tr>
<th></th>
<th>1 Completely cannot do</th>
<th>2 A little</th>
<th>3 Somewhat</th>
<th>4 Completely can do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influence the decisions that are made in my organization.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get through difficult times and hard issues and remain calm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solve problem and generating novel ideas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deal successfully with donors and volunteers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deal successfully with recipients of the service</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicate and coordinate with other agencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperate and collaborate with other agencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deal effectively with unexpected events</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4- Please indicate the degree of agreement or disagreement with the following statements regarding workers in your organization?

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workers in my organisation including me are</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open to change</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actively and widely scans for new information about what is going on</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good at making sense of ambiguous, uncertain situations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take advantage of opportunities quickly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good at quickly deploying and redeploying resources to support execution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share the organisation’s value and beliefs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Know and focus on the big challenges facing our organisation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5- Please indicate the degree of agreement or disagreement regarding improvisational actions that workers in your organization (including you) do during disasters and crises.

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workers believe disaster and crises we deal with can be fully controlled</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workers believe doing things by the book is the right managerial style to deal with disasters and crises</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workers believe experimenting unplanned and new solutions can increase the effectiveness of the organization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During disaster and crises, workers sometimes short-circuit bureaucratic decision-making processes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During disaster and crises, workers sometimes takes on new activities that he or she may or may not be authorized to do vis-a-vis the role</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During disaster and crises, workers sometimes issue orders to others over whom he or she ordinarily has no authority.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thank you for your participation
University of North Texas Institutional Review Board

Informed Consent Notice

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

Title of Study: Organizational learning capacity as a predictor of individuals’ tendency towards improvisation in nonprofit organizations.

Student Investigator: Saleh Alhumaid, University of North Texas (UNT) Department of Public Administration. Supervising Investigator: Dr. Andrew, Simon, UNT Department of Public Administration.

Purpose of the Study: You are being asked to participate in a research study which involves examining the relationship between organizational learning and individuals’ tendency towards improvisation. This will be done by examining direct and possible mediating effects between organizational learning and individuals’ tendency towards improvisation in non-profit organizations.

Study Procedures: You will be asked about organizational characteristics, such as age, size and number of staff. Also, you will be asked about your perception of day-to-day activities in your organization; self-efficacy and the agility of workforce, including you and the tendency of individuals to improvise during emergency times. This will take about 5-10 min of your time.

Foreseeable Risks: No foreseeable risks are involved in this study.

Benefits to the Subjects or Others: The study is not expected to be of any direct benefit to the subject, but we hope to contribute to the scholarly research on organizational learning by stressing the importance of micro perspective of organizational learning in understanding theory of learning in the context of emergency management. In addition, we will empirically examine the particular outputs or effects of organizational learning and its relationship to important outcomes, such as agility and self-efficacy, which are key factors for effective disaster response. Finally, we hope to draw attention to the importance of organizational learning that has been largely neglected in the nonprofit sector.

Compensation for Participants: None.

Procedures for Maintaining Confidentiality of Research Records: Responses will be kept completely confidential and only the researcher will see individual survey responses. Paper data records will be kept in locked file cabinet stored in locked office on campus. Organizations will be given secret codes and the list of organizations addresses will be kept encrypted and in a
separate location from the data file. Any mean of reporting will be made only in the aggregate meaning. No individual response can be identified from the data. Data will be stored electronically in a password protected folder.

**Questions about the Study:** If you have any questions about the study, you may contact Saleh Alhumaid at SalehAlhumid@my.unt.edu or Dr. Simon A. Andrew at sandrew@unt.edu.

**Review for the Protection of Participants:** This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

**Research Participants’ Rights:**

Your participation in the survey confirms that you have read all of the above and that you agree to all of the following:

- Saleh Alhumaid has explained the study to you and you have had an opportunity to contact him/her with any questions about the study. You have been informed of the possible benefits and the potential risks of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You understand you may print a copy of this form for your records.
APPENDIX B

DESCRIPTIVE STATISTICS
### Gender of Respondent

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>268</td>
<td>88.2</td>
<td>88.2</td>
<td>88.2</td>
</tr>
<tr>
<td>Valid female</td>
<td>36</td>
<td>11.8</td>
<td>11.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>304</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### Respondent level of education

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JEDDAH</td>
<td>107</td>
<td>35.2</td>
<td>35.2</td>
<td>35.2</td>
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<tr>
<td>MAKKAH</td>
<td>122</td>
<td>40.1</td>
<td>40.1</td>
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</tr>
<tr>
<td>MEDINA</td>
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<td>24.7</td>
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</tr>
<tr>
<td>Total</td>
<td>304</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

### Statistics

<table>
<thead>
<tr>
<th></th>
<th>Year in service</th>
<th>Number of full-time staff</th>
<th>Number of volunteers</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Valid</td>
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<td>304</td>
<td>304</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>7.57</td>
<td>163.90</td>
<td>69.36</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>5.333</td>
<td>99.745</td>
<td>50.170</td>
</tr>
<tr>
<td>Minimum</td>
<td>1</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Maximum</td>
<td>26</td>
<td>350</td>
<td>200</td>
</tr>
</tbody>
</table>

145
<table>
<thead>
<tr>
<th>My organization encourages people to think from a community perspective</th>
<th>My organization works together with the outside community to meet mutual needs</th>
<th>My organization builds alignment of visions across different levels and work groups</th>
<th>My organization encourages people to get answers from across the organization when solving problems</th>
<th>In my organization, people openly discuss mistakes in order to learn from them</th>
<th>In my organization, people give open and honest feedback to each other</th>
<th>In my organization, people are rewarded for exploring new ways of working</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Valid</td>
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<td>303</td>
<td>304</td>
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<td>304</td>
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<td>2</td>
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</tr>
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<td>1</td>
<td>1</td>
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<td>75</td>
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<td>3</td>
<td>3</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>My organization enables people to get needed information at any time quickly and easily</th>
<th>My organization gives people control over the resources they need to accomplish their work</th>
<th>In my organization, leaders generally support requests for learning opportunities and training</th>
<th>Influence the decisions that are made in my organization</th>
<th>Get through difficult times and hard issues and remain calm</th>
<th>Solve problem and generating novel ideas</th>
<th>Deal successfully with donors and volunteers</th>
<th>Deal successfully with recipients of the service</th>
</tr>
</thead>
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<tr>
<td>N</td>
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<td>304</td>
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<td>1</td>
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<td>Communicate and coordinate with other agencies</td>
<td>Cooperate and collaborate with other agencies</td>
<td>Deal effectively with unexpected events</td>
<td>Open to change</td>
<td>Actively and widely scan for new information about what is going on</td>
<td>Good at making sense of ambiguous, uncertain situations</td>
<td>Take advantage of opportunities quickly</td>
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<td>Share the organization’s value and beliefs</td>
<td>Know and focus on the big challenges facing our organization</td>
<td>Workers believe disaster and crises we deal with can be fully controlled</td>
<td>Workers believe doing things by the book is the right managerial style to deal with disasters and crises</td>
<td>Workers believe experimenting unplanned and new solutions can increase the effectiveness of the organization</td>
<td>During disaster and crises, workers sometimes take on new activities that he or she may or may not be authorized to do vis-a-vis the role</td>
<td>During disaster and crises, workers sometimes issue orders to others over whom he or she ordinarily has no authority</td>
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