

IMPACTS OF THE LEADER TEAM EXERCISE ON TEAM PERFORMANCE

by

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B.A. Millersville University, 1992

M.S. Baylor University, 2001

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

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Department of Educational Leadership  
College of Education

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

2014

## **Abstract**

In today's interconnected world, teams must form quickly, learn and adapt to overcome challenges regardless of the environment. For example, complexity in responding to natural disasters or man-made political, economic and security crises often requires the ability to learn collaboratively to minimize human suffering and protect property. When teams find success, the operation succeeds beyond what a single organization can provide, but when teams fail they can make a bad situation worse. Leveraging an approach called a Leader Team Exercise (LTX), teams can generate the shared qualities of understanding, confidence and competence in a structured manner to accelerate learning and performance.

This research study investigated the potential of an LTX through initial research in a within-subjects experimental design of the 161st Artillery Battalion, Kansas Army National Guard as they negotiated obstacles located on the Fort Riley, Kansas Field Leaders Reaction Course (FLRC). The quantitative data collected was evaluated employing non-parametric statistical tests to answer five research questions about the relationship of the LTX to dependent variables of team performance, shared understanding and shared confidence to further explore field observations of learning action teams. The study provides new knowledge to further advance understanding of the LTX and its relationship to team performance and learning. In addition, the study also offers a source of data as a foundation for future research to continue investigation into the full depth and breadth of the LTX in other settings and conditions.

The study found a relationship among the dependent variables and the FLRC, as well as a relationship between the LTX and team demographics related to shared understanding and performance. The findings also advance the adult education body of knowledge about learning dynamics, which occur outside the classroom. The implications to improve teams that rapidly

form, disband, and form again will impact adult learning in a wide spectrum of applications in the government, academia and industry. Finally, the study offers recommendations for future areas of research and practical application based on current knowledge for the Kansas National Guard and others who might use or plan on using the LTX in the future.

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# Table of Contents

|  |      |
|--|------|
| List of Figures .....  | xi   |
| List of Tables .....   | xii  |
| Acknowledgements .....   | xiii |
| Dedication .....   | xvii |
| Chapter 1 - Introduction .....   | 1    |
| Overview .....   | 1    |
| Background .....   | 3    |
| Teams of Leaders .....   | 6    |
| Problem Statement .....  | 8    |
| Purpose Statement .....  | 9    |
| Research Questions .....   | 9    |
| Significance of Study .....  | 10   |
| Definition of Terms .....  | 10   |
| Assumptions and Limitations .....  | 13   |
| Procedures .....   | 14   |
| Summary .....  | 16   |
| Chapter 2 - Literature Review .....  | 17   |
| Background .....   | 17   |
| Teams of Leaders Development .....   | 20   |
| Teams of Leaders Development in the Battle Command Knowledge Systems ..... | 30   |
| Teams of Leaders Development in the European Command (USEUCOM) .....       | 36   |
| Team Literature .....  | 39   |
| Hackman and Team Performance .....   | 40   |
| Action Learning and the Learning Organization .....                        | 47   |
| Senge and Team Learning .....  | 47   |
| Marsick & Watkins - Learning Infrastructures .....                         | 48   |
| Garvin and Learning in Action .....  | 49   |
| Foundation in Adult Education .....  | 50   |
| Brookfield and the Democratic Classroom .....                              | 51   |



|   |    |
|---|----|
| Self-Directed Learning.....                             | 54 |
| Adult Motivation to Learn .....                         | 55 |
| Revolutionary Education .....                           | 57 |
| Summary .....   | 58 |
| Chapter 3 - Methodology .....                           | 59 |
| Introduction.....                                       | 59 |
| Research Questions.....                                 | 59 |
| Design of the Study.....                                | 60 |
| Procedure .....   | 62 |
| Instruments.....  | 65 |
| The Leadership Reaction Course .....                    | 65 |
| Teams of Leaders Survey.....                            | 69 |
| The Population.....                                     | 71 |
| Sample .....  | 73 |
| Battery Command Leader Teams .....                      | 74 |
| Headquarters, and Headquarters Battery (HHB) Teams..... | 74 |
| Battalion Command Teams.....                            | 74 |
| Sample Test Groups.....                                 | 75 |
| Data Collection .....                                   | 75 |
| Data Analysis .....                                     | 76 |
| Protection of Human Rights .....                        | 77 |
| Summary .....   | 78 |
| Chapter 4 - Findings.....                               | 79 |
| Introduction.....                                       | 79 |
| Demographics .....                                      | 80 |
| Age .....   | 82 |
| Gender.....   | 83 |
| Years Military Service .....                            | 84 |
| FLRC Experience.....                                    | 85 |
| Analysis of Performance Data .....                      | 85 |
| Research Question 1 .....                               | 86 |

|  |     |
|--|-----|
| Analysis of Survey Results .....                                   | 87  |
| Research Question 2 .....  | 89  |
| Research Question 3 .....  | 92  |
| Correlation among Variables .....                                  | 97  |
| Research Question 4 .....  | 97  |
| Research Question 5 .....  | 99  |
| After Action Review Observations .....                             | 100 |
| Summary of Research Findings .....                                 | 101 |
| Chapter 5 - Discussion .....                                       | 103 |
| Introduction .....   | 103 |
| Discussion of Findings and Conclusions .....                       | 103 |
| Research Question 1 .....  | 103 |
| Research Question 2 .....  | 105 |
| Research Question 3 .....  | 108 |
| Research Question 4 .....  | 109 |
| Research Question 5 .....  | 110 |
| Implication of Results .....                                       | 110 |
| Research Implications .....  | 113 |
| Practical Applications .....                                       | 113 |
| Recommendations for Future Research .....                          | 114 |
| Conclusion .....   | 116 |
| Bibliography .....   | 118 |
| Appendix A - Acronyms .....  | 124 |
| Appendix B - 161 <sup>st</sup> Battalion Approval Memorandum ..... | 126 |
| Appendix C - IRB .....   | 127 |
| Appendix D - LTX Experiment FLRC Guidebook .....                   | 165 |
| Appendix E - Informed Consent Form .....                           | 165 |
| Appendix F - Participant Information Form .....                    | 167 |
| Appendix G - Example of Teams of Leaders (ToL) Surveys .....       | 168 |
| Appendix H - FLRC Performance Data Results .....                   | 169 |
| Appendix I - Survey Data Results - Average by Question .....       | 170 |

## **List of Figures**

|  |    |
|--|----|
| Figure 1.1 Overlapping Components of Teams of Leaders .....              | 7  |
| Figure 2.1 Generating Team Leadership by Increasing Trust .....          | 28 |
| Figure 2.2 Generating Team leadership by Increasing all SKA .....        | 29 |
| Figure 2.3 BCKS Initial Concepts and Objectives .....                    | 33 |
| Figure 2.4 BCKS Concepts and Objectives circa 2006 .....                 | 35 |
| Figure 2.5 The Conditions for Team Effectiveness .....                   | 42 |
| Figure 2.6. Six Conditions for Senior Leadership Team Effectiveness..... | 44 |
| Figure 2.7 Key Competencies for Leadership of a Senior Team.....         | 45 |
| Figure 3.1 Field Leaders Reaction Course (FLRC) Design Layout .....      | 66 |
| Figure 3.2 Test Group and Sub Set Alignment.....                         | 68 |
| Figure 4.1 Participant Age Histogram .....                               | 83 |
| Figure 4.2 Participant Military Service Histogram.....                   | 85 |

## **List of Tables**

|   |    |
|---|----|
| Table 3.1 Layout for the Within-Subjects Experiment / Crossover Design Experiment .....   | 78 |
| Table 3.2 161st Artillery Battalion, Kansas Army National Guard Authorized Strength ..... | 72 |
| Table 3.3 161st Artillery Battalion, Kansas Army National Guard Actual Strength .....     | 73 |
| Table 3.4 Cluster Sample and Test Group Alignment.....                                    | 75 |
| Table 3.5 FLRC Sub Sets Objective, Metrics and Penalties.....                             | 76 |
| Table 4.1 Participant Descriptive Statistics .....  | 81 |
| Table 1.1 Team Descriptive Statistics .....   | 81 |
| Table 4.3 Wilcoxon Rank Sum Results for Team Performance.....                             | 86 |
| Table 4.4 Analysis of Pre-test/ Mid-test (Surveys 1 and 2) “Shared Understanding” .....   | 90 |
| Table 4.5 Analysis of Mid-test/Post-test (Surveys 2 and 3) “Shared Understanding” .....   | 91 |
| Table 4.6 Analysis of Pre-test/Post-test (Surveys 1 and 3) “Shared Understanding” .....   | 91 |
| Table 4.7 Analysis of Pre-test/ Mid-test (Surveys 1 and 2) “Shared Confidence” .....      | 94 |
| Table 4.8 Analysis of Mid-test/ Post-test (Surveys 2 and 3) “Shared Confidence” .....     | 95 |
| Table 4.9 Analysis of Pre-test/ Post-test (Surveys 1 and 3) “Shared Confidence” .....     | 96 |

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The journey home is never a direct route; it is, in fact, always circuitous, and somewhere along the way, we discover that the journey is more significant than the destination, and that the people we meet along the way will be the traveling companions of our memories forever (2002).

As Nelson DeMille's character highlights, great journeys are never accomplished alone and there were countless conversations, emails, and even a kind word now and again that compelled a thought or encouraged forward progress. Collectively, those who helped me contributed far more than they received and although impossible to capture them all, I hope in some small way to say thank you and acknowledge their support.

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## **Dedication**

To my wife Dawn and our two children, Bradley and Locarno -

Thank you for sharing this life with me.

*"All my love"*

# **Chapter 1 - Introduction**

## **Overview**

The complexity in responding to natural disasters or manmade political, economic, and security crises often requires the ability to learn collaboratively and adapt quickly to minimize human suffering and protect property. The Nation's response to the natural disasters caused by Hurricanes Katrina and Sandy provides two examples where the post-hurricane environment required a cooperative response among a wide range of actors from local, state, and Federal agencies in concert with local communities. The diversified actors from all those groups had to rapidly form, disband, and form again to quickly learn while doing and apply their expertise towards responding to a particular problem from the natural disaster. The formation of these teams, which often times crossed organizational boundaries and chains of command, was required to assemble expertise and experience to address unique challenges. Team formation was often difficult due to members possessing different backgrounds and organizational cultures making shared understanding and confidence among members difficult. In addition, this diversity among members required teams to first establish a sense of shared qualities with one another to create a secure psychological environment necessary to allow for the free exchange of ideas that promotes learning (Edmondson, 2012). Without first establishing a secure learning environment, teams risk consuming more time to manage basic tasks, which inhibit their ability to achieve higher performance and collaborating more effectively (Brown, 2009; Prevu et al, 2011).

Successes and failures of these cross boundary teams are often highlighted during after action reviews of major disasters. For example, the Nation's response to the natural disasters caused by Hurricane Katrina (White House Archives, 2006, see also Kaniewski, 2011) and more

recently Hurricane Sandy (Levin, 2012) demonstrate where diverse teams from local, state, and Federal agencies are needed to rapidly form and learn in order to adapt training and experiences to the particular incident. The examples from Hurricane Katrina are not unlike the situation experienced at the United States European Command Headquarters (USEUCOM) in Stuttgart Germany a few years later managing a late summer crisis in the Russian Caucasus Region of Asia. A surprise August 2008 military incursion into South Ossetia, Georgia by Russian troops was quickly followed by a humanitarian crisis and a request for assistance from the Georgian Government through the U.S. Ambassador. Leveraging an approach called Teams of Leaders (ToL), USEUCOM was able to quickly build intergovernmental and interagency teams spanning three continents that collectively learned, planned at the same time they delivered supplies to relieve the human suffering. Teams had to execute despite the lack of prior experience working together and often not physically meeting due to the physical distances and varying time zones among the participants (Hilton, 2009).

Both these examples provided sufficient evidence to warrant a closer investigation of the ToL program developed at USEUCOM in order to further determine if their success can be replicated for use in other locations and circumstances. Observations of action teams made at USEUCOM Headquarters during the crisis action response and then a second time during a follow-on observation of intergovernmental teams during a major military exercise the following spring indicated a much wider application was possible (Prevou, Veitch, & Sullivan, 2009). Further research would assist towards determining if teams applying the ToL approach exhibited more shared understanding and collaboration among members necessary to establish a psychological secure environment to increase learning and adaptability. Due to the lack of research data, there was insufficient information available to corroborate the field observations

about the effectiveness beyond those made at USEUCOM. This study began that inquiry to collect and analyze research data to further understand the potential of ToL and inform follow-on studies.

## **Background**

In order to learn or understand ways to improve team learning and performance beyond the mechanics of traditional team construction, there is a necessity to comprehend the underlying concepts that all team members bring to the team (Hackman, 2002). Comprehension is particularly important in the case of diversified teams where common shared attributes are not as likely to exist prior to team formation but essential for their success (Bradford & Brown, 2008). Furthermore, the rapidly changing conditions during a disaster response or on the modern battlefield only accentuate the need for teams to find novel solutions to maintain a competitive advantage (Murray, 2011). Therefore, the stress faced by first responders or the military provides an excellent medium from which to understand the unseen forces that influence learning among teams.

Hackman (2002), while researching team performance, identified that most organizations believe teams are an effective way to achieve innovative solutions to problems but are generally poor in organizing and enabling them for success (p. 31). Hackman (2002) further identified five essential conditions as necessary for team success which include strong leadership to organize the team, sufficient resources, and available coaching throughout the team's life cycle. Research has proven that these essential conditions are effective in enabling teams, but none of them offer an approach that enables the relationship between team members to develop the interpersonal dynamics necessary for performance (Edmondson, 2012).

Wilson's (2007) research on adventure racing teams under stress designed to observe how team members learn from one. He concluded that higher performing teams throughout the race demonstrated more language conducive to collaborative problem solving between members than language between team members of lower scoring teams (p. ix). Specifically, he noted that conditional language helped the team to generate a shared sense of their situation, team member's needs, and solutions to problems, which improved response and performance under extreme fatigue and stress (2007). On the other hand, Wilson (2007) observed that lower performing teams in the race demonstrated more challenging and adversarial inter-team language which prohibited collaboration, increased friction, and miscommunication. Senge (2006) had previously established a similar conclusion that positive inter-team members language was important to overcome bias and allow for inclusion of new ideas and brainstorming among the group or team. Wilson's and Senge's observations both highlight the interpersonal component to team success that must also be present in addition to Hackman's enabling structure described earlier.

By building on Hackman and Wilson's research, Edmondson (2012) focuses more on the human dimension and the interpersonal relationships and the act of teaming rather than solely on the effective construction of teams. Edmondson (2012) specifically highlights several leadership actions that promote teaming and team learning. She also includes the need for a psychologically secure environment, which promotes learning, to include learning from failure (2012). Edmondson's research reinforces Wilson's findings and provides further evidence that an approach, which enables inter-team relationships, will also contribute towards increased performance. Both expand our understanding about learning and team performance; though,

neither one offers a practical or structured approach a team might employ to build or achieve stronger relationships among members to enable learning or higher performance.

The US Army, in response to challenges faced during over 10 years of fighting in two diversified theaters of war, recently adjusted its doctrine on the art and science of war from one that was technology-centric. The new doctrine called, mission command, adjusted the US Army's philosophy to a new way of thinking that placed greater emphasis on the human dimension of warfare (Army Doctrine Publication 6-0, 2012). One key addition in the mission command doctrine was the inclusion of a primary task for all commanders and leaders to build teams both within their units and among the diversified set of other actors who share the modern battlefield. Mission command also placed an emphasis on trust and shared understanding as essential components to build teams and that the realities of modern combat made teaming and learning with non-traditional partners essential (2012). The challenge faced by the US Army in the early stages of both wars, which led to the shift in thinking about mission command, is best described by General William Wallace, then Commander of the Army's Training and Doctrine Command (TRADOC), during an interview with Thomas Barnett (2006) from Esquire Magazine:

The business that we are doing-the really complex stuff that's going on in the battlefield today-requires the kid on the ground to know what his boss is thinking; requires the boss to know what the kid is seeing; it requires those who have seen the same sort of situation in different parts of the world to share it with those who might be seeing it for the first time. And it requires that those who are being presented with it for the first time are presented with it at our training centers, as opposed to in contact with the enemy. (p. 217)

Prior to the publication of the US Army's Mission Command doctrine, there was an earlier initiative to improve teams and team learning called Teams of Leaders (Brown, 2006; Bradford & Brown, 2008). The ToL concept intersected emerging theories on knowledge management, information management towards enabling peers of leaders that often construct cross-boundary teams. In addition, teams employs a structured exercise called the Leader Team Exercise (LTX) to assist in generating trust and shared understanding to increase confidence among members (Brown, 2006). The LTX offers the means for teams to build on the enabling structure identified by Hackman (2002) and the interpersonal relationships observed by Senge (2006), Wilson (2007), and Edmondson (2012).

### **Teams of Leaders**

ToL consists of three components, high performing leader teams (HP LT), information management (IM) and knowledge management (KM). As described by USEUCOM's *Teams of Leaders Coaching Guide* (2009), these three components together facilitate a continuous collaborative environment, team building, and shared trust, which enable teams to make and execute decisions while rapidly sharing what they have learned or know:

The Teams of Leaders (ToL) approach combines the effective employment of information technology, and knowledge management collaboration processes with a deliberate team development methodology that enables the Leader-Team to see the problems, achieve actionable understanding, orient solutions, and get the job done faster and to a higher standard. (p. 1)

The combined effects of intersecting IM and KM only increase the enabling of leader teams. As described by Brown (2009), the team can employ the “mutually reinforcing interactions of ToL—IM, KM and team building—allow the crossing of various boundaries

without regard to time or distance (time = zero and distance = zero)” to expand the effect achieved by teams through actions such as the LTX to develop high performance (p.4). Figure 1.1 shows the overlapping integration of the three components of ToL.

**Figure 1.1 Overlapping Components of Teams of Leaders**



The first component, leader teams, describes a team constructed of members from different organizations, cultures, agencies, or backgrounds that each brings specific knowledge, skills, and attitudes to the team. Unlike most descriptions of teams, which focus on hierarchical teams where relationships and team structure are well defined, teams within the ToL construct also include informal teams of peers or leaders who each bring expertise with no clear hierarchy or predetermined structure. As described in the US Army Doctrine Publication 6-0 (2012), “these leader-team members often represent a parent agency, organization, or country and come with varying backgrounds, skill sets, motivations, and agendas as they interact to accomplish a common mission or objective” (p. 7). Furthermore, as observed by Hilton (2009) during the application of ToL at USEUCOM:

Leader teams operate within an environment where strong relationships are forged through shared vision or purpose, shared trust, shared confidence, and shared competence enabled by supportive information



management and knowledge management, they are responsive to opportunities for overcoming barriers and challenges to collaboration. (p. 39)

ToL uses an LTX to provide a structured means to generate shared trust, understanding, confidence, and competence necessary for achieving higher levels of performance and adaptability more quickly (Brown, 2006). These shared qualities are increasingly important in achieving higher performance when team members may not share a common background much beyond an initial agreement to assemble together in order to accomplish a general goal (Brown, 2009). The LTX provides a potential solution to solve these emerging challenges and build the cohesive qualities among leader teams to foster adaptive learning (Brown, 2000). The LTX offers a solution to address the enabling structure proposed by Hackman (2002) and the inter-teaming relationships observed by Senge (2006), Wilson (2007), and Edmondson (2012) as necessary for success.

However, the impact of the LTX on success has been limited to learning in action environments in organizations employing ToL towards organizational performance in achieving goals and objectives. The data collected about the effectiveness of the LTX were limited to only observations of teams within a field setting where variability was harder to determine (Prevou et al, 2009; Prevou, Hilton, Hower, McGurn, & Gibson, 2011). The current lack of research data suggests further research was needed to fully understand the potential of the LTX and its broader application as part of ToL.

## **Problem Statement**

Field observations made during the development and implementation of the LTX indicated promise as an approach towards improving team learning and performance (Brown,

2006; Prevou et al, 2011). However, other than observations of teams in field settings, no initial research was available or has been conducted to control for variability and isolate the LTX as an independent variable. The lack of data limits understanding of the LTX's potential in application and as a basis for comparison to support future research.

### **Purpose Statement**

The purpose of the study was to conduct initial research in order to advance the body of knowledge surrounding ToL and more specifically, the LTX. Since this experiment was initial research, the design and data collected will serve as pioneering information to further advance understanding of the LTX and its relationship to team performance and learning. Finally, the study provides a foundation for future researchers to continue exploration into the full depth and breadth of the LTX in other settings and conditions.

### **Research Questions**

This study investigated the following research questions stated as null hypothesis:

H1<sub>0</sub>: There is no relationship between the dependent variable, team performance, and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

H2<sub>0</sub>: There is no relationship between the dependent variable of shared understanding and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

H3<sub>0</sub>: There is no relationship between the dependent variable of shared confidence and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

H4<sub>0</sub>: There is no correlation between dependent variables team performance, shared understanding, and shared confidence in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

H5<sub>0</sub>: There is no correlation between dependent variables team performance, shared understanding, and shared confidence with the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course FLRC.

### **Significance of Study**

The research provided initial quantitative data about the LTX in a controlled setting, which isolated the LTX as an independent variable. More broadly, the results further expanded the body of knowledge and understanding about the LTX as a means to increase team performance and learning. In particular the study provides supporting evidence for the US Army and the Kansas Army National Guard to determine if the LTX is suitable for inclusion in joint and interagency training and for all members of the government to expand disaster response training.

### **Definition of Terms**

For the purposes of this research study, the following definitions were used. In addition, due to the large number of acronyms an additional list of those used throughout the paper are provided in Appendix A:

1. **Teaming** – when people apply and combine their expertise to perform complex tasks or develop solutions to novel problems (Edmondson, 2012, p. 51).
2. **Leadership Teams** – a group of individuals, each of whom has a personal responsibility for leading some part of an organization, who are interdependent for the purpose of providing overall leadership to a larger enterprise (Hackman, 2011, p. 477).
3. **Teams of Leaders** – describes an approach used to generate high-performing leader-teams quicker than conventional methods. This approach rapidly develops

the shared vision/purpose, trust, competence, and confidence required for high performance. It leverages IM technologies, effective KM, and learning strategies to communicate and collaborate across time and space boundaries, while a newly developed LTX is used to build understanding of the operational situation and team requirements interactive combination of information management (IM), knowledge management (KM) and high-performing leader teams (HP LTs) (*Teams of Leaders Coaching Guide*, 2009, p. 3).

4. **Leader Team Exercise (LTX)** – “process comprises three steps. Team SKA develops primarily through the team, as a group, discussing short vignettes (situations in story form), analyzing the mission/task “what if...,” and developing options and considering the “what then...”. The three steps are:

- Determine and understand the team’s situation and requirements.
- Practice by thinking (talking) through the situation.
- Review your shared actions and decisions.

The leader-team exercise, done in the context of the current mission and situation, results in an accelerated maturation of the four shared qualities: vision, trust, competence, and confidence” (*Teams of Leaders Coaching Guide*, 2009, p. 11).

5. **Deliberate Leader Team Exercise** – “scheduled in advance and normally structured to provide a rich context that can support preparation of both command and control. It can draw on proven assessment MOP/MOE (Measures of Performance/Measures of Effectiveness) from cues embedded in the scenario” (Brown, 2006, p. 41).

6. **Hasty Leader Team Exercise** – “supports the unit in combat and teaches current tactical lessons learned and frequently changing TTP (tactics, techniques and procedures). There is shared context of on-going tactical operations” (Brown, 2006, p. 41).
7. **Sub Set** – an administrative alignment of the FLRC six stations into the groups which support the experiment. Sub Set #1 includes stations four, five, and six located on the western side of the FLRC training area. Sub Set #2 includes stations seven, eight, and nine located on the eastern half of the course. Figure 3.2 shows the layout of the FLRC stations.
8. **Vertical Teams** – “any grouping of commanders and staff members (linked by common functions) who must collaborate across contiguous or noncontiguous echelons to integrate and synchronize the elements of combat power” (Cox, et al, 2002, p. 2).
9. **Learning Organization** – “an organization skilled at creating, acquiring, interpreting, transferring and retaining knowledge and at purposefully modifying its behavior to reflect new knowledge and insights” (Garvin, 2000, p. 11).
10. **Leader Team** – “Each member brings specific skills, knowledge, and attitudes to the team to help accomplish an objective and each “*leader*” is part of a greater organization that the leader-team member can reach back to for expertise and support. These teams do not follow a hierarchical organizational model, but rather operate as a network within the hierarchy. At any time, any member of the team may be placed in a lead role for a project or objective” (*Teams of Leaders Coaching Guide*, 2009, p. 4).

## **Assumptions and Limitations**

There were three assumptions which influenced this research. The first assumption was that the participants responded truthfully while completing the surveys and limited their answers solely on their team's ability to negotiate the FLRC. Second, the participants were willing to learn and apply the LTX and did not attempt work-around solutions or revert to prior learned techniques or procedures. No violation of either assumption was observed during the experiment, but it is otherwise impossible to absolutely control for experiential bias in the self-reflection among the participants. Third, field observations of the LTX indicated increased effect when used by diversified teams facing complex problems (Prevou et al, 2011). The demographics of the population and sample in the study were more homogenous compared to those teams observed in the field. This was by design of the study to control diversity and the demographics of the available battalion to support the experiment. The results do not have a direct comparison, but the study was intended to identify an impact of the LTX. Demographic limitations did not prohibit answering the research questions, but does suggest further study is needed to fully explore the field observations made at USEUCOM.

There are four limitations for this research study. First, because the population consisted of the 482 members of the 161<sup>st</sup> Artillery Battalion there was limited generalizability of the results beyond units in the Kansas Army National Guard. Of course team performance and survey data remain limited to the battalion, but as initial research, this limitation did not prevent the drawing conclusions about the research questions, nor from providing initial quantitative data about the LTX.

Second, due to the short timeline of the experiment, the study did not determine the impact of the LTX on team performance linearly over a period of time. Further assessment of the LTX throughout the life cycle of a longer standing team will be necessary through the use of

longitudinal studies in order to add further clarity. Additionally, research over longer periods of time with repeated exposure to the LTX may also ascertain if there is an increasing or decreasing impact on performance.

Third, due to the homogeneity of the unit, no attempt was made to determine the impact of the LTX on shared trust. The 161<sup>st</sup> Artillery Battalion, as a typical among military units, demonstrated a naturally high degree of pre-existing trust based on shared experiences and common backgrounds. The level of shared trust prior to and after the experiment would have been too difficult to ascertain and almost impossible to isolate and measure as a result of the treatment during the experiment. Subsequent studies are needed to examine trust as an additional variable.

Finally, due to the short one day duration of the experiment, the research did not investigate the impact of the LTX on incorporating new team members within an existing team. Team make up is more appropriate for a longitudinal study of teams with longer life cycles than those that negotiated the FLRC as part of their leader development training. Subsequent studies are also needed to examine the impact of team transitions and attrition as an additional variable.

## **Procedures**

A within-subjects design was used to support an experiment on June 18, 2013 at the Field Leaders Reaction Course (FLRC) located on Fort Riley, Kansas. Members of the 161st Artillery Battalion, Kansas Army National Guard, while conducting their annual two-week training exercise, along with a staff of volunteers, conducted the experiment. A within-subjects design was chosen due to the lack of prior research data from which to establish a baseline and to maximize benefits of LTX exposure to the participants. Because within-subjects design participants serve as their own control group, members of the battalion established an

experimental set of baseline data negotiating the FLRC during an initial time period and then conducted a second session after receiving training on the LTX as a treatment for comparison.

The FLRC consisted of 10 stations organized in a semi-circular pattern as an obstacle course designed to build cooperation and critical thinking skills among leaders (Ham, 2009). The course was located on the north side of Fort Riley, Kansas and was consistent with the common design of Leaders Reaction Courses on other bases throughout the US Army. The FLRC was a useful instrument to test the LTX because the obstacles the team had to negotiate relied on basic leadership skills to negotiate obstacles rather than advanced techniques or experiences learned completing other complex tasks associated with the unit's mission. A depiction of the course is included in Figure 3.1 FLRC Design Layout in Chapter 3 along with more details of the procedure and instruments.

In addition to performance data of teams negotiating the FLRC, a modification of a pre-existing ToL Survey was used to measure participant perceptions of shared understanding and confidence. The survey was given three times through a pre-test, intermediate test, called the mid-test, and a post-test, which were administered throughout the experiment to capture control group data and to isolate the LTX. The surveys were adapted from previously designed ToL surveys used specifically for assessing the LTX among teams in field studies which have provided consistent results (Prevou et al, 2009, 2011).

The population and sample groups consisted of members from the 161st Artillery Battalion, Kansas Army National Guard. The sample group comprised of 11 teams of six participants each for a total team size  $n=11$  and a total individual participant size of  $n=66$ . The battalion commander assigned participants to teams based on unit leader development requirements. The teams naturally clustered into three groups identified as Battery Command



Leader Teams, Headquarters, and Headquarters Battery Teams and a Battalion Command Team. The teams were then randomly assigned within each cluster group into one of two similar test groups.

Non-parametric statistical analysis was used to assess the results from the experiment. The tests were appropriate over parametric approaches due to a lack of assumptions about the linear relationship between variables and the small sample size (Fields, 2013; Turner, 2014). For Research Question 1 the Wilcoxon Rank Sum Test was used to compare performance results in both time and number of errors for each obstacle. A second Friedman's Randomized Block Design test was used to assess if team characteristics influenced performance looking at three variables of age, military experience, and prior FLRC experience. The Wilcoxon Rank Sum test was again used to compare changes in survey scores to answer Research Question 2 and 3. The Spearman's Rank-Order Correlation test finally used to investigate the correlations between variables in order to answer Research Question 4 and 5.

## **Summary**

This chapter provided an overview of ToL and the research methodology to investigate the LTX as an essential component to building leader teams. The potential of the LTX had been observed in field studies at USEUCOM, but the lack of quantitative research data available made further study necessary to fully appreciate the potential of the exercise. The chapter also included an overview of an experiment to test the LTX at the FLRC on Fort Riley, Kansas by members of the Kansas Army National Guard, experiment procedures, data analysis, and a summary of how the initial research has contributed towards furthering the body of knowledge.

## **Chapter 2 - Literature Review**

This chapter discusses the background and development of the ToL concept, to include the LTX within the US Army. Specifically, sections on the development within the US Army over the last decade are discussed with the inclusion of recent field research conducted overseas at the USEUCOM. A short literature review of research on teams is also included in areas that have had a direct impact on the development of the LTX. Finally, a short introduction of adult education literature relevant to the LTX is included where learning theories support the LTX. For example, Brookfield, (1990, 1995, 2013), Hackman, (2002, 2010, 2011) and Brown, (2002, 2006, 2009; Bradford & Brown, 2008) all offer overlapping observations, which conceptually support the use of the LTX to enable team learning and increasing performance.

### **Background**

Although arguably the need to learn and work together in teams can be traced back to the beginnings of mankind, the concept of Teams of Leaders traces its conceptual roots back to the US Army's post-Vietnam approach to training and education (Bradford & Brown, 2008). In the summer of 1973, the US Army established a new headquarters to oversee training and education throughout the US Army called the Army Training and Doctrine Command or TRADOC (King, 2013). The creation of TRADOC was the first time the US Army had ever consolidated training and education programs into one headquarters rather than spread out among independent schools, centers, and colleges (p. 1). The result was training and education throughout a soldier's or officer's career from initial entry basic training through senior leader development was managed by one organization with unity of command and purpose (p.1).

The creation of TRADOC provided a foundation for the beginning of what retired Lieutenant General Brown (2003) described as the first of three training revolutions experienced

by the US Army over the past 40 years. The first revolution centered on standardization through the creation of “task, condition, and standards” in the development and delivery of training and education (p. 54). These changes were also defined by inclusion of on the job training and assessment. The result was the infusion of learning throughout a soldier’s career both in school and on the job that throughout the 1970s and 1980s continued to evolve as TRADOC became more experienced in leading Army education programs (King, 2013).

By the 1980s the success in institutionalizing training led to TRADOC being selected by the US Army to lead a new initiative called the Army of Excellence (2013). The initiative focused on reorganizing US Army force structure to support emerging Air Land Battle Doctrine that emphasized the need for forces to work as part of an inter-service team (2013). The US Army’s Field Manual 100-5 (1993), titled *Operations*, highlight development of new the concept through doctrine that described the US Army as, “a key member of the Joint team, the Army serves alongside the Air Force, Navy, and Marine Corps to protect the nation’s vital security interests” (p. 1-4). TRADOC’s improvement of training and development of Air Land Battle Doctrine over the 1970s and 1980s culminated in the successful 1991 defeat of Saddam Hussain’s forces in Iraq during Desert Shield/Desert Storm (King, 2013).

Nearly simultaneously to the victory in Iraq, the Cold War with the Soviet Union ended leaving the US as the sole remaining superpower. In addition, the immediate Post Cold War period in the early 1990s saw rapid growth and change in technologically throughout the world. For the U.S. Army, both conditions led to an increased level of ambiguity about the types of threats and missions the service would likely face in the future (2013). In addition, changes in technology influenced everything in the military from weapons, vehicles, and communications, which created pressure on how training and education was conducted (Bradford & Brown,

2008). Furthermore, peacekeeping operations and humanitarian assistance missions, such as those in Bosnia and Florida after Hurricane Andrew, highlighted new demands for soldiers to work with a growing number and diversity of actors regardless of mission. For example, an initial change in the 1993 version of Field Manual 100-5 *Operations* recognized the change and included guidance on working with interagency partners throughout the government:

Army forces must be prepared to conduct a number of operations that integrate warfighting and operations other than war with a variety of government and nongovernment agencies, other services, forces from other nations, and international agencies (p. 2-2)

As a result the U.S. Army needed to make adjustments in training and education throughout the 1990s away from Air Land Battle Doctrine to a new one eventually titled “Full Spectrum Operations.” The concept was eventually introduced formally in 2001 through new doctrine within Field Manual 3-0 *Operations* to account for more diversity among the types of missions, participants and complexity. In addition to changes in doctrine, Brown (2002, 2003) observed that the U.S. Army’s operating environment was now also being infused with rapidly evolving technology, most notably connectivity via the Internet. Brown (2003) also noted that changes in the environment and impact of technology had resulted in the beginning of a second training revolution by the late 1990s.

Brown’s (2003) second training paradigm centered on a shift from the successful training concepts of the previous two decades towards a new one centered around learning, to include expanded self-development, and education to reinforce training in order to prepare for unpredictable situations in the future (p. 55). Ambiguity included working with diversified leaders from new organizations and agencies on the modern battlefield (Bradford & Brown, 2008). Also, the U.S. Army had begun to develop and integrate new distributed learning

technologies and adjustment to curriculum to produce what a Training and Leader Development Panel also concluded in 2003 as “a self-aware and adaptive leader” who has “the doctrine, tools, and support to foster lifelong learning in the U.S. Army through balanced educational and operational experiences supported by self-development” (Brown, 2003, p. OS-18).

In 1999 the U.S. Army made a dramatic shift to Army Transformation under Chief of Staff of the Army, General Shinseki (King, 2013). As part of Army Transformation, the U.S. Army would develop an Objective Force and the Future Combat System (FCS) shifting focus towards a more modular and agile design among its unit formations (Objective Force White Paper, as cited in King, 2008). The Army Transformation initiative would also initiate a service wide culture change to overcome the current one that was “resting on its laurels from its performance during Operation Desert Storm and the end of the Cold War” (King, 2008, p.2). The Chief of Staff of the Army started a multi-year Army Training and Leader Development Panel (ATLDP) to “identify the characteristics and skills required for leaders of the transforming force” and “examine the current systems for training and leader development to see what changes would provide the best leaders for our Army” (Steele & Walters, 2001, p.2)

### **Teams of Leaders Development**

As part of Army Transformation, Brown (2000) led a study for the Institute for Defense Analysis (IDA) in support of TRADOC and the Defense Advanced Research Projects Agency (DARPA). The intent of the study was to describe “requirements for adaptive leaders and learning methodologies to prepare adaptive land power leaders of all grades to prevail in likely future conflicts” (p.iii). Brown (2000) suggested a fundamental change was needed for future leader development by expanding traditional learning venues focused on individuals and collective training among units to include learning and operating in teams. The inclusion of

teams was eventually incorporated into U.S. Army doctrine and leadership manual, titled FM 6-22 *Army Leadership* (2006) with a section dedicated to “leader teams” a foundational concept within Teams of Leaders.

Brown (2000) also proposed that due to the increased operational tempo and growing availability of technology a requirement emerged for self-developmental learning among leaders in both formal and informal environments. The availability of the Internet increased “just-in-time opportunities” for decentralized self-directed learning, offered that “an entirely new perspective of leader development can prevail” (p.III-18). Because of technology, institutional learning resulted in structured delivery occurring further away and more often outside of traditional TRADOC classrooms to include small teams who are virtually or peer mentored (2000, p. III-17). As a result to changes in leader preparation and self-development and the “advent of vastly expanded data and information exchanges associated with Army digitization, no one acts alone” (2003, p. 59). The U.S. Army needed to increase leader development to all learning domains and add a new one, teams, and those teams should extended vertically throughout the command and staff (Brown, 2002).

The Army Research Institute (Cox, Holder, Lelbrecht, & DeRoche, 2002) sponsored initial qualitative research at Fort Lewis, Washington by observing and interviewing members of Interim Brigade Combat Team (IBCT). The IBCT was one of the first units designated as an interim step or bridge towards the future Army Transformation Objective Force (2002). The unit was fielded with a new Interim Armored Vehicle (IAV), called the Stryker, which required changes to operating procedures to effectively employ and fight with the vehicle. In addition, the unit also was re-organized into a new unit organizational and personnel design that employed

emerging doctrine, which relied on leadership skills and attributes in order to take advantage of emerging technology (2002).

The research investigated the employment of leader development necessary to fight the IBCT to include identifying “the emerging training and professional development needs of the Objective Force” (p. 2). Also included in the assessment were vertical teams defined by the research as “any grouping of commanders and staff members (linked by common functions) who must collaborate across contiguous or noncontiguous echelons to integrate and synchronize the elements of combat power” (p. 2). The research observed the importance of commander and supervisor involvement in adaptive leader development, to include competencies needed to generate skills, knowledge, and attributes to build vertical leader teams (p. 46). Finally, foreshadowing the coming conflicts in Iraq and Afghanistan, the research concluded that future commanders would need to build vertical leader teams broader than Army formations to include complex and diversified environments:

Future forces will also be expected to understand the practices and operations of higher echelon formations. The requirement to respond directly to joint or component headquarters and the license to task theater, other service, and even national assets will tax the capabilities of future leader teams. The need to cooperate closely with foreign military contingents and civil agencies (both U.S. and foreign) without losing team effectiveness will also challenge future vertical team leaders. The Army's training and training support communities will have to prepare Objective Force leader teams and individual leaders with the knowledge and experience base needed to perform competently under such conditions. (p. 47)

Finally, the research study also focused on the IBCT's “vignette-based training technique” with the intent to develop “special multi-echelon training exercises to prepare IBCT

leaders and leader teams for the challenges of their newly formed units” (p. 3). The vignettes were not constructed to teach a specific solution, but instead were flexible in design to allow the facilitator leeway to adapt to each situation and employ vertically down the chain of command using the same scenario in multiple iterations (p. 32). The researchers observed that the training did “enhance vertical team integration and individual leader skills while also developing essential team competencies among primary and supporting staff” (p. 33). They further concluded that:

In the hands of well-prepared leaders-facilitators, the experimental vignette-based leader training technique employed in the IBCCT appeared to be a powerful training tool. It offers easily executable alternatives to achieve leader and team training objectives. The technique holds great promise as a means of leader development training and vertical team integration in future forces. (p. iii)

The vignette-based leader team training would serve as an important foundation for the eventual development of the LTX within the ToL framework (Bradford & Brown, 2008). However, the researcher did note the need for further study and offered sixteen recommendations including to “validate the training effectiveness of the vignette-based technique in terms of effects on subsequent performance and learning” along with “using statistically valid methods study the relationship between leader qualifications and vertical leader team performance” (p. 49). Although numerous field studies have been conducted, no formal research exists on the role of vignette-based training in the LTX design within peer reviewed journals.

IDA conducted a follow-on study titled *Learning to Adapt to Asymmetric Threats* (Tillson, Freeman, Burns, Michel, LeCuyer, Scales, & Worley, 2005) to identify “changes necessary to the military’s learning environment” due to the Global War on Terrorism and combat operations in Iraq and Afghanistan (p. 1). Specifically, researchers, “conduct a survey of



service and joint adaptability-related training programs, of corporate training programs, and of the extensive psychological and training/education literature related to adaptability” (p. 4). The study was significant in connecting initial Army Transformation to changes in leader development that resulted from new Global War on Terrorism requirements and U.S. Army Doctrine (FM 3-0, 2008, FM-22-6, 2006).

In addition, the study (Tillson, et al, 2005) also reached several important conclusions that would influence the development of Teams of Leaders and the LTX. First, the study concluded that individual and collective training programs were well-defined in the force, but “the problem then becomes one of training commands that can create novel combined arms teams—across branches and across services—from the lowest tactical echelons through the operational levels” (p. 16). The study continued to highlight gaps in Army leader development and education in areas of teams both from a learning, as well as an operational construct. The study also further supported the conclusions and recommendations from Cox et al (2002) (see also Brown, 2000, 2002) on vertical teams that in spite of the addition of teams into the 2002 version of Field Manual 6-22 *Army Leadership* not a lot of institutional change had actually occurred in incorporating teams into leader development.

Tillson, et al (2005) *Learning to Adapt to Asymmetric Threats* study also concluded the same observations made by Brown (2000, 2002) and Cox et al (2002), that commander responsibilities to lead and participate in vertical teams had begun to push down lower from traditional levels of authority. In addition they observed that recent combat operations in Iraq and Afghanistan were only increasing the pressure to power down and the trend was likely to continue into the future. Tillson, et al (2005) recommended that the Department of Defense “must design adaptive training events for the command and leader teams responsible for the

higher levels of war” (p. 18) since technology and “military operations in urban areas” were demonstrating “that combined arms teams are required at the lowest tactical levels” (p. 16). This led to an addition in the development of teams of leaders as an important component of transformation:

The second element comes through in all of our research on adaptable teams. The literature makes it clear that trust and cohesion are essential prerequisites for developing adaptive teams. More important, perhaps, is the recognition that human interpersonal dynamics trump technology. This is an important insight because it may be possible to change human interpersonal dynamics more rapidly than to incorporate new technology.  
(p. 34)

Tillson, et al (2005) also observed the inclusion of skills, knowledge, and attributes described by Brown (2000, 2002) as important additions to team training beyond skills and task proficiency:

Individuals make up teams and must prepare for their roles in teams.  
Teams must learn to operate effectively themselves and with other teams.  
It is in this context that we think about the individual relational skills of self-awareness and the team-oriented relational skills that are social rather than task-oriented skills. (Tillson, et al, 2005, p. 49)

Finally, Tillson, et al (2005) also made two important recommendations towards the development of ToL and the LTX. First the study proposed the inclusion of an emerging “collaborative environment” called the Battle Command Knowledge System (BCKS) “to facilitate both the sharing of knowledge and development of adaptability-related skills” (p, S-3). The BCKS would leverage technology and knowledge management growing throughout the force (Brown, 2006). The second recommendation was to expand ongoing initiatives throughout the Department of Defense, which involved decision making exercises (DMXs) to include those

developed by Gary Klein (2003) “to integrate creative and critical thinking” (p. 64) alongside leader development of “Team Relational Skills” (p. 65). This recommendation included several new decision making approaches, including the LTX, in use at Fort Leavenworth, also highlighted by Brown (2006) in a follow-on IDA study titled, *Building High-Performing Commander Leader Teams: Intensive Collaboration Enabled by Information Technology and Knowledge Management*.

The study by Brown (2006) was a jointly sponsored to complete an independent assessment of BCKS intended as a:

Partial fulfillment of the “Independent Evaluation of Battle Command Knowledge System Networks and Services” task. It was prepared to support the development of advanced leader and leader-team preparation in conjunction with the formulation and then development of Blocks Two and Three of the emerging Army Battle Command Knowledge System. (p. iii)

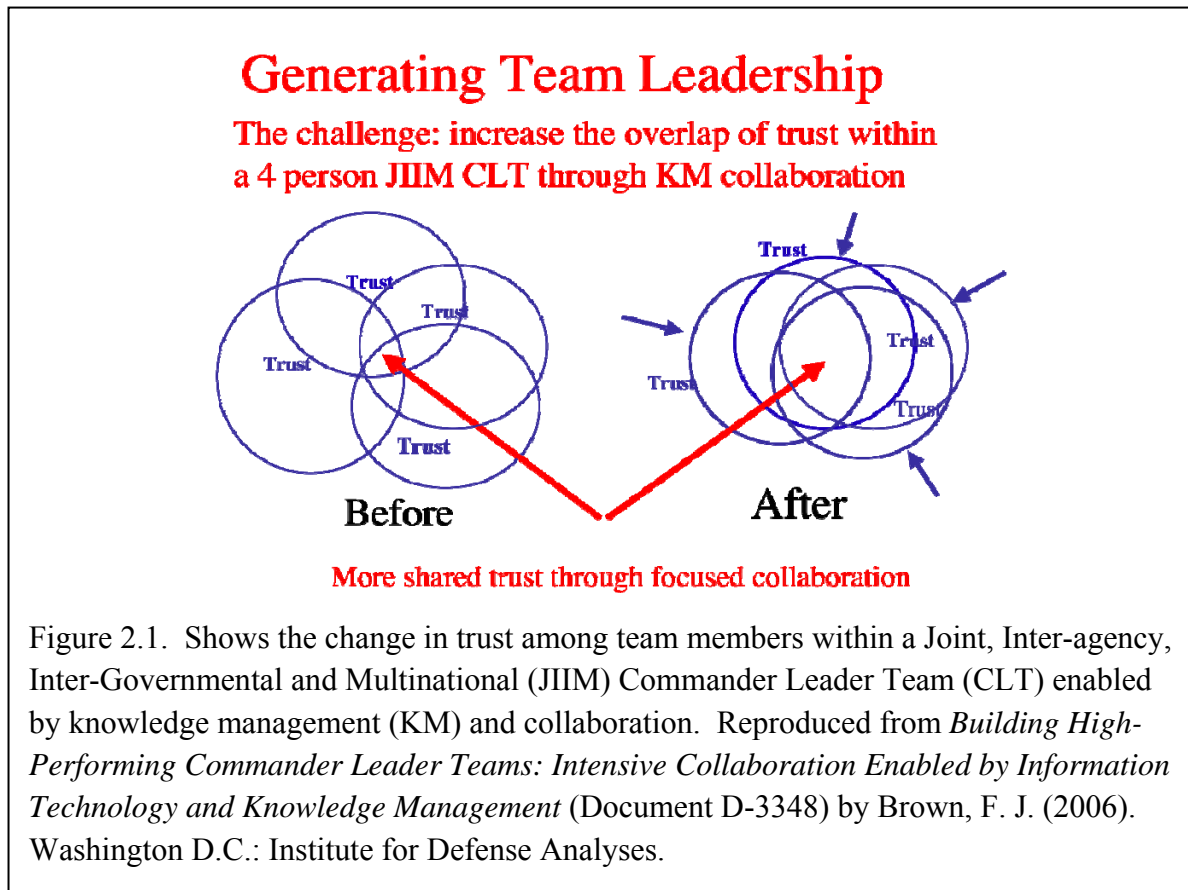
Brown (2006) emphasized the Block Three phase of the BCKS implementation, which included the full integration of the Commander Leader Team concept further enabled by advanced technology and information and knowledge management. Brown (2006) also observed that, although advanced technology and knowledge management was available to further support learning, new tools were also needed to achieve high performance among teams, which included the LTX (p. 33). Brown further defined the LTX as consisting of two different formats, hasty or deliberate (p. 41). The deliberate LTX occurring in structured learning environments and the hasty for use by, “the unit in combat and teaches current tactical lessons learned and frequently changing TTP” (p. 41) where TTP stands for Tactics, Techniques, and Procedures (Joint Publication 1-02, 2013).

Brown (2002, 2006) recommended the application of the LTX for use by commanders in structured and informal training to “train vertical leader teams” (p. 39). This included “joint and allied units and civilian organizations; and functionally-oriented vertical teams of staff leaders” rather than just traditional unit based hierarchical teams, which were the norm at the time (p. 39). Brown (2006) further noted that commanders could employ the LTX to accomplish the following:

- Develop the chain of command into a high-performing team capable of effective team decision-making and teamwork.
- Present experiential leader learning opportunities developing individual skills (interpersonal, conceptual, technical, and tactical).
- Present experiential leader team learning opportunities developing intensive collaboration that generates team leadership SKA—shared trust, shared vision, shared competence and shared confidence—and then shared knowledge and actionable shared understanding. (p. 39)

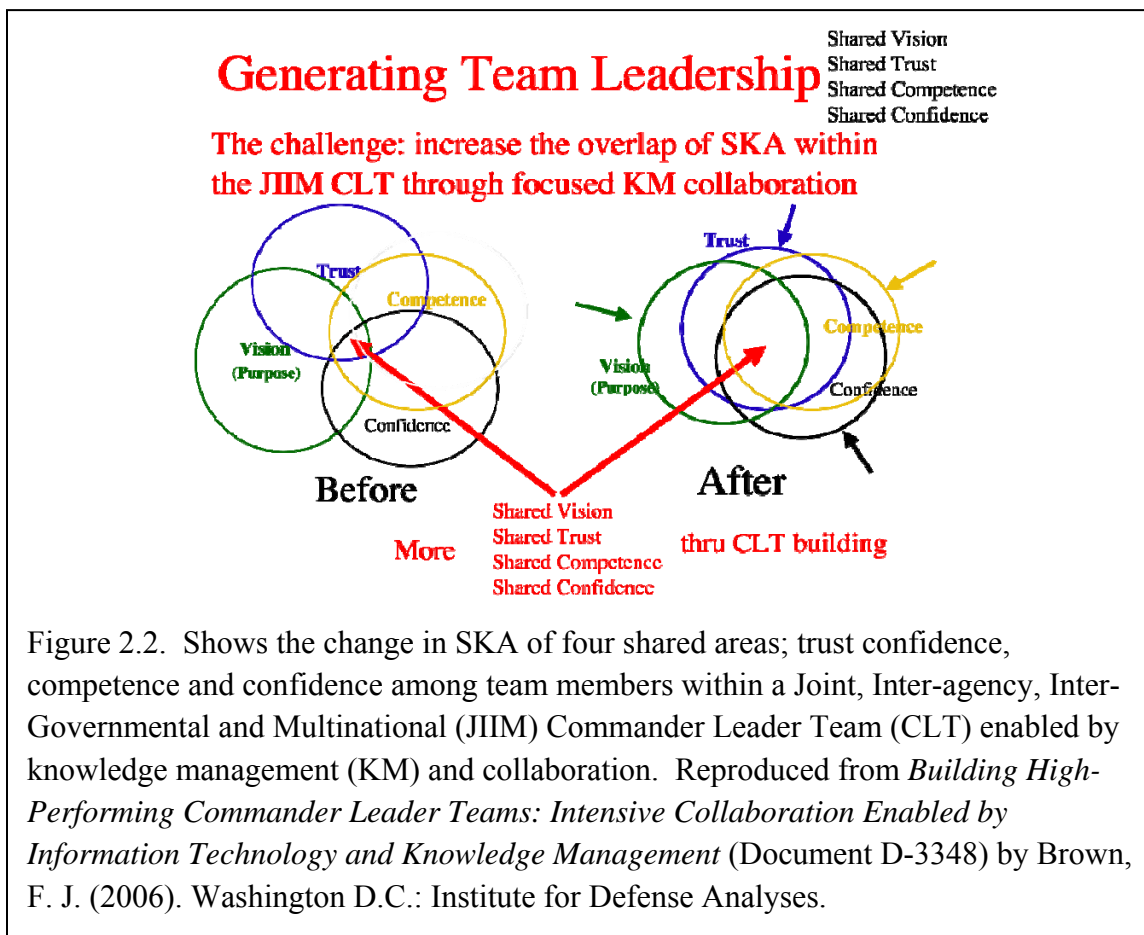
The report also introduced the role of Skills, Knowledge, and Attributes (SKA) as a part of team leadership that, “exists to the extent that there are shared SKA consisting of trust, vision, competence, and confidence within the Commander Leader Teams (CLT). Each member of the CLT shares these four SKA with each other member” (p. J-1). Shared SKA becomes stronger through team activities and experiences as shown in in Figure 2.1 with and tools like the LTX useful in accelerating SKA development.

**Figure 2.1 Generating Team Leadership by Increasing Trust**



The generation of the four shared qualities is not mutually exclusive and overlap one another creating the strong interpersonal relationships in teams to include commander Leader Teams. Figure 2.2 (2006, p. K-2) shows trust along with the other three shared qualities working in relationship to one another. These qualities together move the commander leader team to what Brown (2006) observed as higher performing. Combined with the synergistic effects of knowledge management provided by BCKS and information management within the U.S. Army, the foundation of the current Teams of Leaders concept was established and later described in Bradford & Brown's (2008) book titled, *America's Army, A Model for Interagency Effectiveness*.

**Figure 2.2 Generating Team Leadership by Increasing All SKA**



According to Brown (2003, 2006; see also Bradford & Brown, 2008) the adoption and application of ToL was as the final impetus to move the U.S. Army to a third training revolution where learning occurs in commander leader teams developing SKA alongside traditional task proficiency and learning. Furthermore, with Bradford & Brown's (2008) inclusion of the LTX within the ToL concept, the exercise had become a means to fill the gap first observed by Cox, et al, (2002), to accomplish "the adaptive leader development, to include competencies needed to generate skills, knowledge and attributes to build vertical leader teams" (p. 46). The LTX also became an important tool to support team adaptive learning observed as a necessity by mid-decade in Tillson et al (2005) study to counter new threats from the Global War on Terror.

### ***Teams of Leaders Development in the Battle Command Knowledge Systems***

As the U.S. Army begun to leverage emerging technologies to support changes in leader development, a parallel effort was initiated to distribute lessons learned into the learning process (Dixon, 2000; Marsick & Watkins, 1999). The Center for Army Lessons Learned (CALL) led the effort for the U.S. Army and established the University After Next (UAN) program in 1998 “to explore advanced technologies, processes and procedures that would support the transformation of the Army from an information based to a knowledge based organization” (Warrior Knowledge Network, 2002). This program was the initial effort to build an organization that’s mission was to support the adaptive learning changes underway in the Army. Later the mission to assist in the distribution of lessons was added to enable team learning to respond to changing operating environments due to the Global War on Terror (Brown, 2000; Cox et al, 2002; Tillson et al 2005).

Simultaneously, multiple self-forming Communities of Practice (CoP) grew around the peer to peer exchange of ideas among young leaders and soldiers. The concept of community learning had also been growing in academia and industry with both having recognized a positive symbiotic relationship with traditional learning at brick and mortar schools (Wenger, 1998; Wenger, McDermott & Snyder, 2002; Saint-Onge & Wallace, 2003). The U.S. Army rebranded their CoPs as Army Professional Forums (APF) and incorporated the communities into professional development and formal leader education (Brown, 2006; Bradford & Brown 2008; see also Dixon, Allen, Burgess, Kilner, & Schweitzer, 2005; Baum, 2005). West Point for, example, migrated an APF and incorporated the community into their education program called CompanyCommand.Com, which focused on the learning demands of young captains preparing for company command. West Point later added a second community for new lieutenants preparing to become platoon leaders and incorporated the concept into the curriculum for cadets

(Dixon, et al, 2005). Both would grow into large communities and serve as a model for APF integration into formal education programs throughout other schools and centers across the Army with support from TRADOC (2005).

The Command and General Staff College (CGSC) at Fort Leavenworth had established a new department called the Leader Network in late 2003 to facilitate APF development throughout the college. CGSC sponsored communities centered on the learning demands for new field grade officers preparing for initial assignments as Majors, as well as, officers returning to prepare for command as Lieutenants Colonels and Colonels of battalions and brigades. These two programs would lead the development of APF doctrine and lessons learned and in cooperation with West Point to provide the intellectual environment necessary to foster the growth of new communities throughout the U.S. Army (Dixon et al, 2005; Baum, 2005). The peer to peer learning was an important contributor to the development of Teams of Leaders specifically learning in Commander Leader Teams (CLT) and distributed teams in the preparation and execution of military operations (Brown, 2002, 2006).

Also occurring during the same time period at Fort Leavenworth another important development towards Teams of Leaders evolved. Two important learning tools at the School for Command Preparation (SCP) were being developed that employed vignettes similar to those described by Cox, et al. (2002). Both were related to CLT informal learning, but in a structured format called “Think Like a Commander” (TLAC) a digital Duffer’s Drift was used as part of an end of course exercises. The tools were designed to cultivate critical thinking skills for commanders and their staffs with each other and other units and through the vignettes establish shared vision and trust (Brown, 2006; Bradford & Brown, 2008). Both tools also incorporated



intuitive decision making techniques developed by Gary Klein (1998, 2003) to form the foundation of the LTX.

In the summer of 2004, the U.S. Army expanded WKN again renaming it as the Battle Command Knowledge Network (BCKN) and added to the organization community learning via APFs and tools like TLAC from SCP. The new organization employed advanced knowledge management capability from the WKN with emerging learning techniques to pushed packaged informal learning programs to Army units. Specifically, the U.S. Army published Army Knowledge Management (AKM) Guidance Memorandum Number 5 – Army Training Enterprise Integration (ATEI) on September 7<sup>th</sup> to:

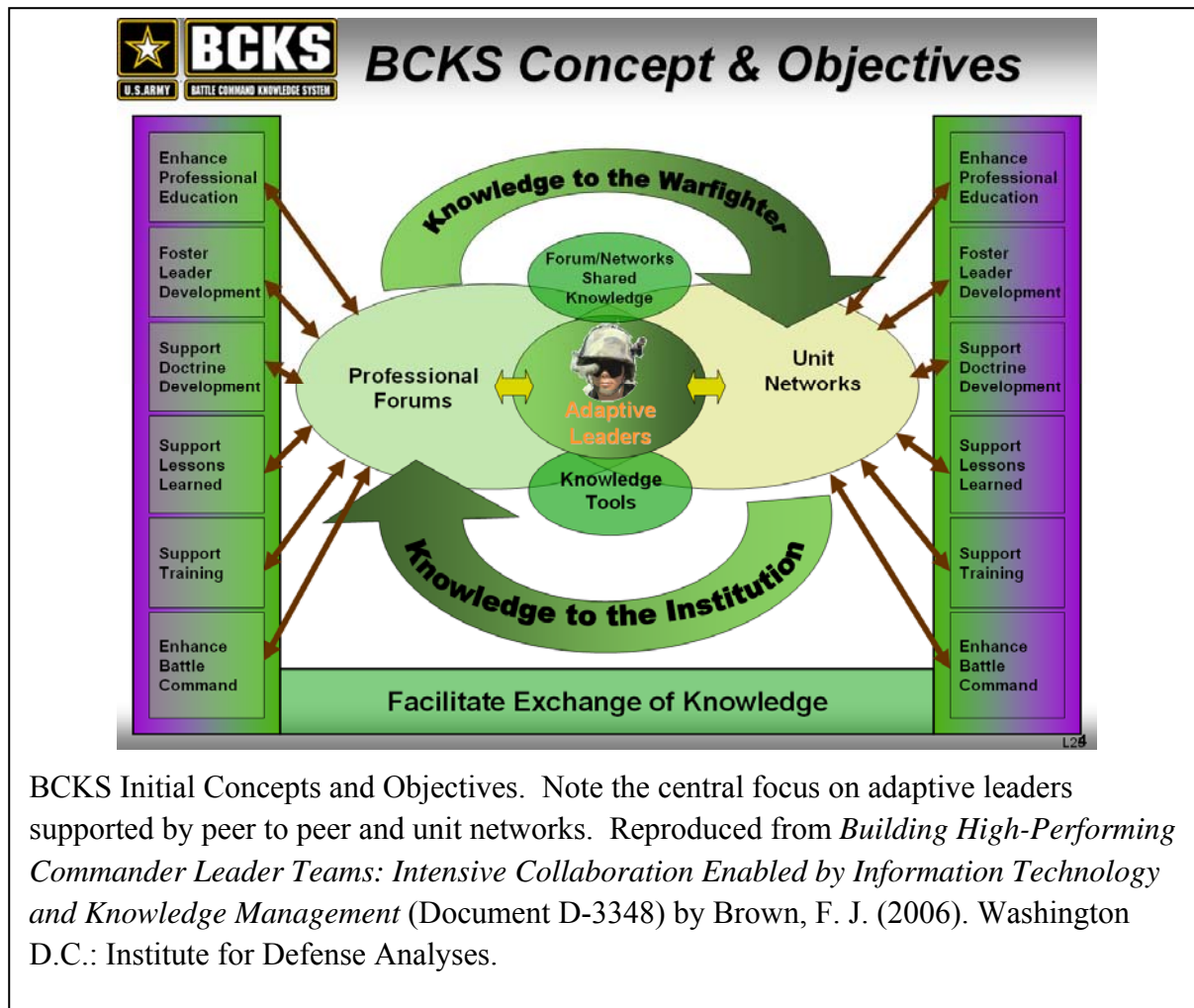
Develop and distribute knowledge via a dynamic, global-knowledge network called Battle Command Knowledge Systems (BCKS), the purpose of providing immediate access to joint service training and leader development resources. The BCKS, a networked and embedded system, will enable capabilities (knowledge, skills and attributes) based on real Warfighter experiences to reduce the decision-making cycle time or eliminate options for an adaptive adversary. (AKM Memo #5, 2004)

An organization with the same name was established by the Combined Arms Center (CAC) at Fort Leavenworth, Kansas in the summer of 2004 by merging the Warrior Knowledge Network, Leader Network and staff from the Command and General Staff College. The initial mission of BCKS given by the CAC Commander:

Battle Command Knowledge System (BCKS) supports the online generation, application, management and exploitation of Army knowledge to foster collaboration among Soldiers and Units in order to share expertise and experience; facilitate leader development and intuitive decision making; and support the development of organizations and teams. (Brown, 2006)

A unit network section was also created and added in the fall of 2004 to disseminate best practices and emerging technologies being developed by Army Units in Iraq and Afghanistan after evidence that peer to peer exchange resulted in the reduction of casualties and increased effectiveness during combat operations (Chiarelli & Michaelis, 2006; see also Afghanistan, Iraq Test Theory of Network-Centric Warfare, 2007). Figure 2.3 below shows the original BCKS concepts and objectives and alignment to support both the Institutional and Operational sides of the U.S. Army (Brown, 2006).

**Figure 2.3 BCKS Initial Concepts and Objectives**



Army Professional Forums demonstrated value in supporting adaptive leader development and learning in support of transformation, especially leader self-development opportunities, in an Army Research Institute (ARI) study (Cianciolo, Heiden & Prevou, 2006). However, they observed that APFs had inherent limitations in supporting specific organizational or unit objectives requiring a more active approach:

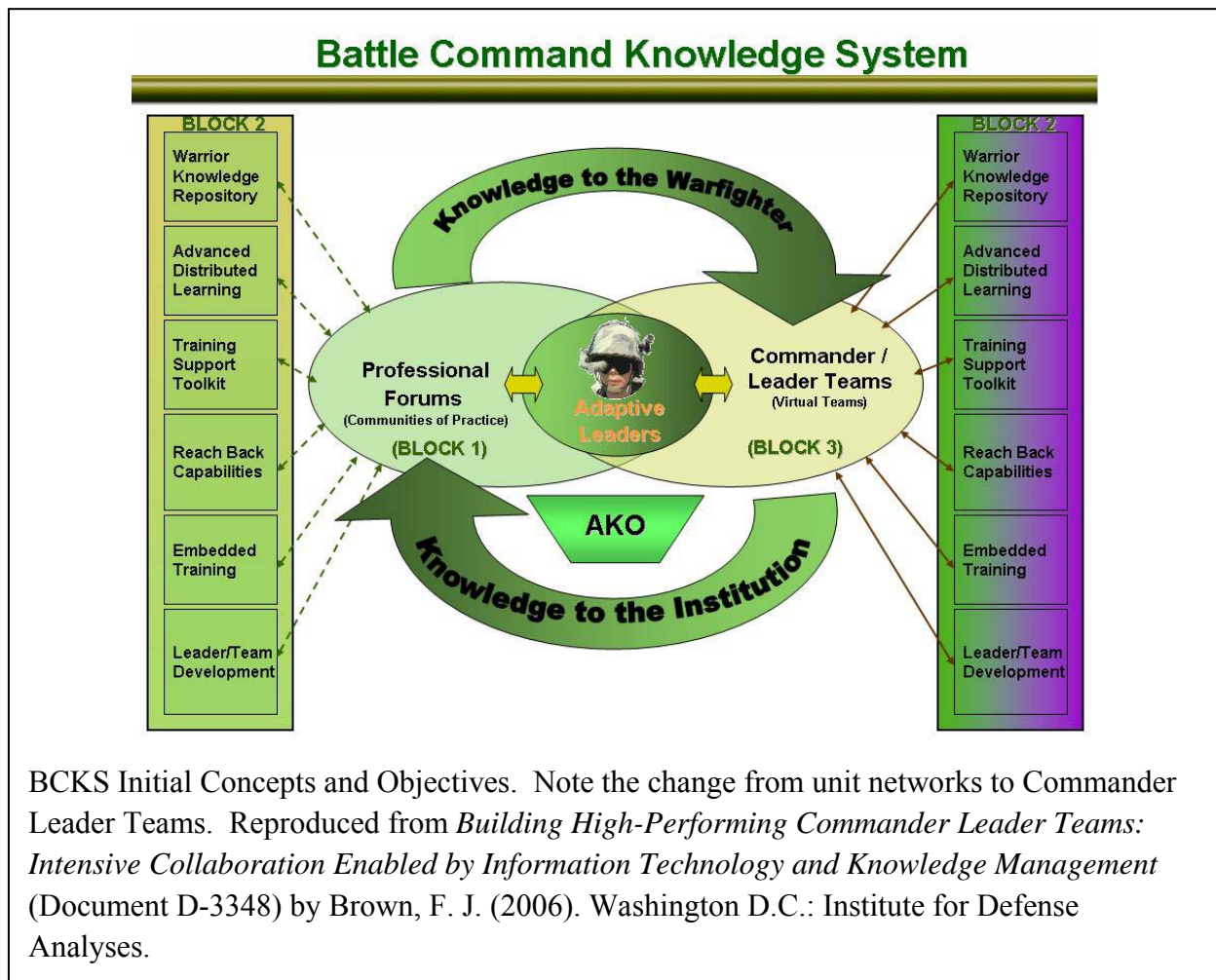
We advise that careful attention be paid to ensuring that APF assessment reflects the delicate balance between the requirements of forum members to grow organically in an informal, consequence-free environment and the requirements of the organization to justify its investment in knowledge sharing to stakeholders. (p. 29)

The research identified the inherent difficulty in measuring APFs impact on unit performance since participation was voluntary and membership alone may indicate a higher level of leader competency (p. 26). The study recommended further research at Army training centers in an attempt at measuring impact, but acknowledged the size and difficulty of the research verses the potential gained at the unit level might prove insufficient beyond just informal learning and leader development (p. 29). Furthermore, feedback from the field in the early stages of the war in Iraq indicated a more concrete approach was needed to facilitate knowledge sharing among leaders in combat. For example, the implementation of CAVNet by the Army's 1<sup>st</sup> Cavalry Division in Baghdad, Iraq facilitated the rapid sharing of lessons by leaders just returning from a patrol with those who were about to depart on a patrol (Patrecia, 2005, see also Silverman, 2006). While professional forums allowed for informal knowledge exchange across the U.S. Army, an approach was needed to assist teams that was more active and responsive to adaptive learning in combat (Cianciolo et al, 2006; Patrecia, 2005; Silverman, 2006).

The U.S. Army's employment of emerging collaborative technology developed at BCKS was now being focused towards leaders operating in teams as first proposed by Brown (2000).

This addition of team learning as part of the BCKS was considered mutually re-enforcing, but more aligned to meet the active learning needs of leaders than professional learning observed in APFs. To address the APF limitations and take advantage of team learning concepts, BCKS in coordination with Brown, established a new initiative called Teams of Leaders in the spring of 2007 (Bradford & Brown, 2008). The BCKS development and integration of commander leader team concepts were now considered essential to the development of adaptive leaders alongside peer to peer learning and updated to reflect the change as shown in Figure 2.4.

**Figure 2.4 BCKS Concepts and Objectives circa 2006**



Furthermore, Jessica Lipnack & Jeffrey Stamps (1994, 1997), experts in virtual teaming from industry, were also consulted. They integrated best practices, to include virtual teaming, as part of the BCKS ToL mission. This culminated in the creation of a new ToL Handbook titled the *Teams of Leaders Handbook: Building Adaptive, High Performing Interagency Teams* in the spring of 2009 intended to increase ToLs application throughout the Army. The Handbook would further refine the LTX both in concept and application and included knowledge and information management integration techniques along with recommend tools to enable collaboration (BCKS, 2009). The Handbook also included virtual team considerations, the inclusion of the LTX for teams inside of CoPs and formally expanded leader team doctrine beyond the U.S. Army to include Joint, Interagency, Inter-governmental and Multinational (JIIM) partners (BCKS, 2009; Bradford & Brown, 2008; Brown, 2009). Finally, by 2012 the U.S. Army had incorporated this concept into doctrine by the end of the decade in its Field Manuals and Army Doctrine Publications (ADP) to includes ones on Operations (2011, 2012), Mission Command (2012) and Leadership (2012).

### ***Teams of Leaders Development in the European Command (USEUCOM)***

The Department of Defense (DoD) announced in 2007 the creation of a new Headquarters called the United States Africa Command Headquarters (AFRICOM) with an organic Inter-Agency design and that USEUCOM had been given the mission to build it (Crawley, 2007; Garamone, 2007). To support the effort a three year ToL Initiative was adopted in 2007 by the USEUCOM Commander, General John Craddock as a program to increase the cross boundary collaboration within the Headquarters. Initially, the ToL program was intended to support AFRICOM's creation by:

ToL has been charged to support program design and activation in this important national interagency effort within the U.S. European Command to improve national security policy formation and execution. Clearly, ToL must evolve to be responsive to important joint and interagency decision processes at every level. (Bradford & Brown, 2008, p. 155)

The inherent value of ToL to expand cross boundary collaboration was quickly realized in the development of Joint and Interagency Team development in support of the AFRICOM mission and by early 2008, the program quickly expanded through multiple pilots throughout the USEUCOM Staff. This expansion also realized effective performance increases through the vertical and horizontal collaboration between officers assigned to Office of Defense Cooperation (ODC) inside of U.S. Embassies throughout Europe and the Headquarters (Brown, 2009). In particular, the value of information system alignment and knowledge sharing practices allowed for the rapid formation of ad hoc or informal teams through the LTX observed by Brown:

Now I propose the LTX, triggering a new, wholly complementary, relationship-building paradigm inter alia by increasing effective communication and stimulating improved collaboration. The new complementary paradigm is IM, KM and team-building interaction stimulated by LTXs to generate high-performing leader teams practicing actionable understanding. (2009, p. 8)

Due to increased evidence of LTX success in the USEUCOM and in collaboration with BCKS the headquarters established the creation of a USEUCOM *Teams of Leaders Coaching Guide* (2009) for the day to day application of ToL in general and the LTX specifically within the organization. Brown (2009) observed that the guide provided leaders with a structured process to enable teams:

User value-added is the fuel for expanding ToL, then building that leader team to high performance using ToL team-building processes, particularly

LTXs described in the EUCOM Teams of Leaders Coaching Guide. And ToL “energizers”—drawing on common accepted practices. (p. 3)

For the first time as part of the program, USEUCOM embedded ToL observers to perform initial analysis of the LTX’s impact as part of interagency support during Austere Challenge ’09, a major exercise conducted by U.S. Forces across the European Continent (Prevou, et al, 2009). Specifically, the observers were tasked with observing and assisting “the initial Geographic Combatant Command and Joint Task Force (JTF) support operation of the State Department Coordinator of Reconstruction and Stabilization (S/CRS)” integrated within the headquarters for the event (Brown, 2009, p. 4).

As part of Austere Challenge, Prevou et al (2009) imbedded into a Joint Inter-Agency Task Force (JIATF) consisting of five separate teams to observe gaps in successfully building high performing teams. He concluded a need for a structured approach to enable adaptive learning, especially within cross boundary leader teams with members from the S/CRS and USEUCOM coordinating in work groups to support the exercise. Prevou et al (2009; see also Prevou et al, 2011) concluded that a structured learning approach which incorporates vignettes, like the LTX, established both before and employed during a crisis can effectively increase a team’s performance. Although the results indicated positive gains in team performance the research was limited to only five teams and due to exercise demands could not control many of the external variables influencing the teams (2009).

ToL, as a separate initiative at EUCOM, ended in September, 2010 after three years. The USEUCOM Commander had concluded that the cultural changes had altered the organizational climate to one that enabled effective learning and collaboration. ToL resources were distributed throughout the Headquarters and integrated into enduring activities. General Craddock remarked on the success of the program:

During my tenure as EUCOM Commander one of the two most significant "wins" was the Command's embrace of the Teams of Leaders concept. Without question -- ToL was and remains the enabler for a significantly higher performing staff, increased horizontal and vertical communications, and shared priorities and focus of effort. This -- ToL -- is no silver bullet - - not fairy dust -- but rather the application of enlightened, thoughtful, effective procedures by talented professionals -- commencing with a series of " ah-ha's" that quickly become self-generating. While buffeted by the growth of the Command, thanks to ToL, based upon the ToL precedent, I am increasingly enthusiastic about what this program offers to the US whole of government and multinational organizations. (Brown, 2009)

### **Team Literature**

Today a large body of research exists on teams, which reaches all the way back to the formation of the modern corporation throughout the last century. However, this particular review will focus on the specific literature and research applicable to teams of leaders and the leader team exercise. While the U.S. Army pursued research in support of its transformation efforts and learning during combat operations, an accompanying amount of corollary research also occurred in both academia and industry. Schein (1999) a leading researcher on corporations noted in his work *The Corporate Culture Survival Guide* that “if you are the agent of change, the key to managing transformative change is to balance survival anxiety with enough psychological safety to overcome resistance to change” (p. 189). In some cases, such as Klein’s (2003) work on intuitive decision making, research was accomplished in close cooperation among academia, industry, and government communities who learned from one another and provided support during the change management process.



### ***Hackman and Team Performance***

In a 1998 article ‘Why Teams Don’t Work,’ Hackman, a leading expert from Harvard University highlights the promise of increased benefits of working in teams:

Teams bring more resources, and more diverse resources, to bear on a task than could any single performer. Moreover, teams offer flexibility in the use of those resources—the capability to quickly redeploy member talents and energies and to keep the work going even when some members are unavailable (p. 245).

He goes on to state that in spite of the overwhelming promise, “research evidence about team performance shows that teams usually do less well—not better—than the sum of their members’ individual contributions” (p. 246). Hackman highlighted that there are six common mistakes made by managers in the construction and employment of teams:

- Mistake 1: Use a Team for Work That Is Better Done by Individuals (p. 248).
- Mistake 2: Call the Performing Unit a Team but Really Manage Members as Individuals (p. 249).
- Mistake 3: Fall Off the Authority Balance Beam (p. 250).
- Mistake 4: Dismantle Existing Organizational Structures So That Teams Will Be Fully “Empowered” to Accomplish the Work (p. 252).
- Mistake 5: Specify Challenging Team Objectives, but Skimp on Organizational Supports (p. 253).
- Mistake 6: Assume That Members Already Have All the Skills They Need to Work Well as a Team (p. 254).

Hackman further proposes the existence of two primary obstacles, co-opt and corporate, that were diametrically opposite, but that together set conditions for managers to make the previous common mistakes made in team formation (p. 260). The co-opt obstacle as defined by Hackman (1998) was the application of Democratic values to supersede the creative thinking and sharing of ideas, “that in cooperative organizations, those ideals so frequently get in the way of

creating the very conditions that promote team effectiveness” (p. 258). Subsequently, the corporate challenge was the corporate bureaucracy and culture preventing effective performance of established teams due to:

Organizational structures, systems, and policies that have been turned over the years to control and support work performed by individual employees. Managers are understandably reluctant to overturn well-established organizational features just to see whether work teams actually generate the benefits claimed for them. (p. 259)

As a result, Hackman made two important recommendations that will influence future research. First, that “that creating and supporting work teams in organizations often requires the redirection of strong institutional forces, the activity is more appropriately viewed as revolutionary than as management-as-usual” (p. 264) or arguably transformational in nature. Second, “that both research on teams and competent leadership of them also require unconventionality in how one thinks about teams and the factors that affect their performance” (p. 264) which warrants further research and understanding.

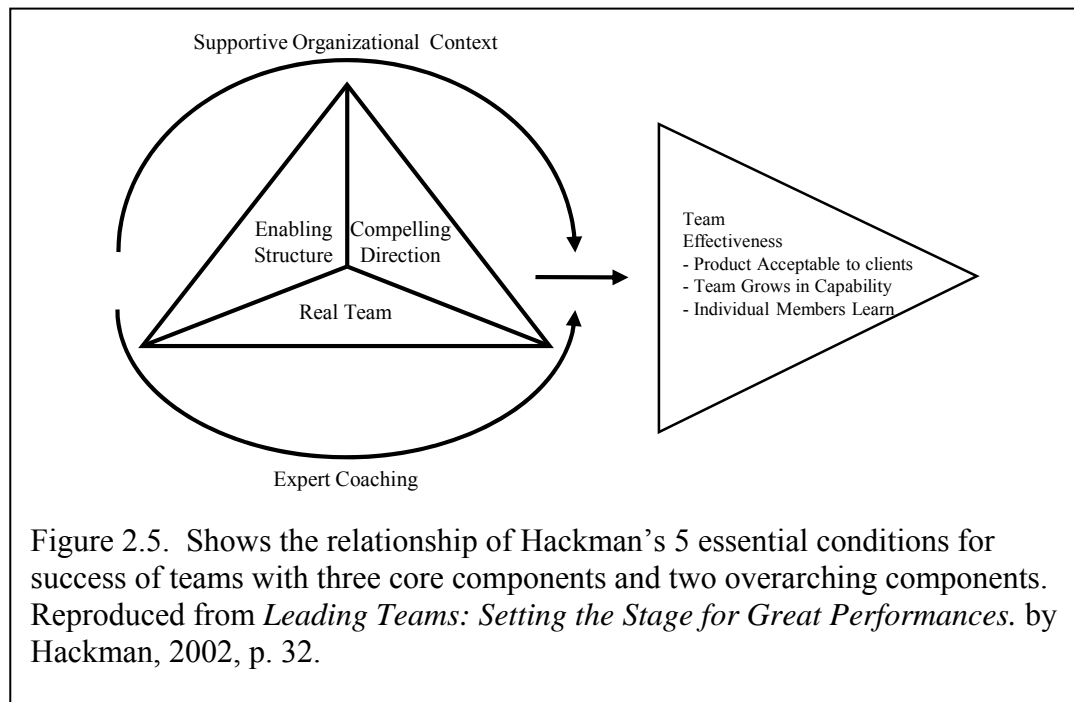
Hackman (2002) in *Leading Teams: Setting the Stage for Great Performances* synthesized over two decades of research on teams, assumptions about teams and reality observed in their performance in action. He built on his previous research on why teams don’t work with offering, “five conditions that leaders can put in place to increase the chance that the team will, over time, achieve a high standing” (p. 31) on “a team product acceptable to clients, growth in team capability, and a group experience meaningful and satisfying for members” (p. 30). The five conditions were:

when a team (1) is a real team rather than a team in name only, (2) has a compelling direction for its work, (3) has an enabling structure that facilitates rather than impedes teamwork, (4) operates within a supportive

organizational context, and (5) has available ample expert coaching in teamwork. (p. 31)

Figure 2.6 shows the five conditions needed for team effectiveness as described by Hackman and the associated team effectiveness.

**Figure 2.5 The Conditions for Team Effectiveness**



Hackman further recommended that the five conditions require continued leadership to fine tune and make adjustments once the basic conditions are in place (p. 254). He also cautiously proposed a two-step model “specifically for use when implementing work teams in organizations” (p. 244) which are “be prepared” and “lie in wait” (p. 244). The first step, be prepared, was described as the study to “create, support and lead work teams” (p. 245), as well as, “envisioning what might be created” (p. 245) and finally “political action” (p. 245) to support the implementation of teams. The second step was about timing and when to force and when to be patient in implementing necessary changes to make teams work (p. 246).

Finally, Hackman discussed the challenges facing the effective use of teams stating that, “we also have seen that it is much easier to describe the conditions that foster team effectiveness than it is to create and sustain them in work organizations” (p. 254). Hackman’s work influenced Prevou et al (2009, 2011) work with USEUCOM, directly citing Hackman’s (2002) five conditions as essential for success, with the addition of ToL and the LTX as a means to achieve rather than just describe team effectiveness.

Wageman, Nunes, Burruss, & Hackman (2008) worked in cooperation with Hackman findings to further research teams beyond organizational work teams (Hackman, 2002) to investigate senior leadership teams constructed of corporate executives that, “focuses on what it takes to lead a team whose members are themselves leaders” (2008, p. xi). They would further define the dilemma of these teams stating:

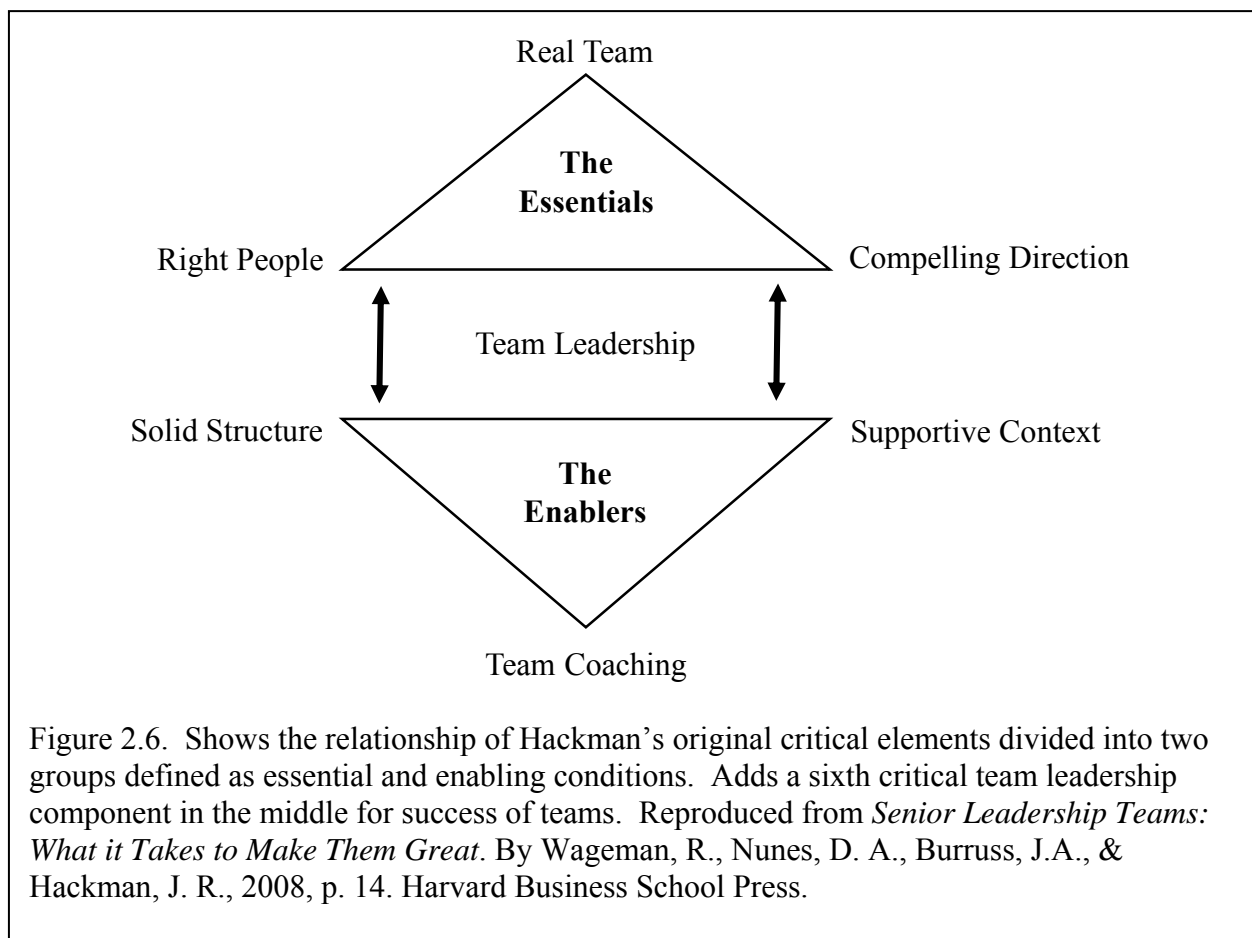
On the one hand they are responsible for leading their own organizational units. On the other hand, they are expected to be fully engaged and committed members of the enterprise’s senior team. It can feel like being caught in two powerful cross currents. (p. xi)

These senior leadership teams were comparable to the leader teams described by Brown (2002, 2006, 2009) and Bradford & Brown (2008) that leaders in the Military were facing working with senior leaders from across the government, sister services, and multinational partners. The research further refined Hackman’s five conditions for team effectiveness dividing them into two elements, essential and enabling conditions (p. 13), and a sixth component, a critical function (p. 184), team leadership as shown in Figure 2.6.

The researchers concluded from observing senior leader teams that when the three essential elements were in place, “the team has a solid foundation for carrying out its work and is poised to set out on a course of increasingly competent teamwork” (p. 15). If the essential

elements were not attainable they concluded it was better to not form a team at all and identify another solution (p. 16). These essential elements were comparable to Teams of Leaders and the need for top down and identification of leader team members and the rule of engagement for teamwork (Bradford & Brown, 2008, Brown, 2009).

**Figure 2.6. Six Conditions for Senior Leadership Team Effectiveness**



The three enabling conditions described as a “solid team structure,” “supportive organizational context,” and “competent team coaching” (p. 18) where previously identified by Hackman (1998, 2002). The difference in the new model, shown in Figure 2.6, is that the enabling conditions do not necessarily need to be present initially, but “can be strengthened as

the team gains experience and maturity” (p. 18). Again these were relevant in ToL with Prevou et al (2009, 2011) finding a higher degree of team performance when the three conditions were relevant, particularly coaching.

The addition of team leadership was included as a critical condition that was central to bringing the elements of essential and enabling conditions together (Wageman, et al, 2008), noting that these are more critical than the individual leadership characteristics themselves (p.183). Furthermore, they broke down team leadership into two categories, team design, and hands-on leadership, ensuring that the team was a real team and properly coached and led (p.184). Figure 2.7 shows Wageman’s et al (2008) breakdown of senior leader teams both in the diagnostic phase or team planning and in execution.

**Figure 2.7 Key Competencies for Leadership of a Senior Team**

|            | Team Design                               | Hands-on Leadership                  |
|------------|---|--------------------------------------|
| Diagnostic | Organizational acuity<br>Conceptual skill | Monitoring skill<br>Empathy          |
| Execution  | Ability to decide<br>Political skill      | Ability to inspire<br>Coaching skill |

Figure 2.7. Breaks down the sixth critical team leadership component into preparatory and execution components in the creation of senior leader teams. Reproduced from *Senior Leadership Teams: What it Takes to Make Them Great*. By Wageman, R., Nunes, D. A., Burruss, J.A., & Hackman, J. R., 2008, p. 185. Harvard Business School Press.

Included in each box were the leadership competencies necessary for senior leader teams to become “great” (p. 185). These appeared to correlate with Brown’s (2000, 2006) skills, knowledge, and attributes, which also centered on the interpersonal relationships between team members. Furthermore, Wageman et al (2008) also identified the similar need for learning as

described in Brown's 2000 report *Preparation of Leaders* in order to move from average performance to greatness, stating, "ideally, senior team leaders behave in ways that foster continuous learning, both their own and that of team members, thereby helping a team and its members become increasingly capable (p. 204).

As research on the application of teams continued to evolve over the last decade, Hackman's (2010) research appeared to converge with Brown (2009) and Prevu et al (2009, 2011) with the latter adopting the LTX. He further defined them as "a group of individuals, each of whom has a personal responsibility for leading some part of an organization, who are interdependent for the purpose of providing overall leadership to a larger enterprise (Hackman, 2010, p. 477). Most recently Hackman (2011) applied the six conditions outlined in Figure 2.7 in research conducted within the Intelligence Community on teams. He concluded that:

Mere exhortation to collaborate and team-building exercise intended to promote harmony and trust are insufficient to produce results. Teams have to be thoughtfully designed and supported if they are to be an effective means of engaging individuals' resources in pursuit of collective purposes. (p. 167)

Hackman's work, however, does not account for the challenges among joint, inter-agency, intergovernmental, and multinational leader teams discussed by Brown (2009). Nor did he offer the means to build leadership teams in an ad hoc or learning in action environments where structure is less defined. Accounting for more fluid situations where authority was pushed further down the chain of command was observed as a necessity among military teams in responding to new threats combatting terrorism (Tillson et al, 2005).

Hackman (2011) did include many similar characteristics for leadership teams as those used to describe commander leader teams, such as shared purpose (p. 496); however, there was no discussion of a tool or approach similar to the leader team exercise as a potential methodology

team members could employ to achieve the six conditions describe as needed for team success (Hackman, 2010, 2011; Wageman, et al (2008).

### **Action Learning and the Learning Organization**

There exists a rich history on action learning and the learning organization. However, this literary review was limited in nature and did not provide a comprehensive overview of the topic and was limited to founding principles that influenced the early development of Teams of Leaders. Research in action learning and learning organizations continued to evolve alongside ToL over the past decade, but did not have the same direct impact as the development of the LTX or areas of ToL investigated within this study.

### ***Senge and Team Learning***

The concept of the Learning Organization simultaneously grew at the same time leader development was changing through Army Transformation (King, 2013). New knowledge management concepts alongside the emergence of the Internet and information technology had influenced thinking on how organizations could learn, notably captured by Peter Senge's (1999) book titled, *The Fifth Discipline: The Art & Practice of the Learning Organization*. Senge's (2006) revised edition of the same title defined five disciplines of the learning organization that included, personal mastery, mental models, shared vision, team learning, and systems thinking. Senge (2006) further defined that "team learning starts with dialogue," (p. 10) which allows team members to "suspend assumptions and enter into a genuine thinking together" (p. 10). Senge (2006) further defined the results of team learning as:

The process of aligning and developing the capacity of the team to create the results its members truly desire. It develops on the discipline of shared vision. It also builds on personal mastery, for talented teams are made up of talented individuals. (p. 218)



Senge further proposed that the five disciplines must “develop as an ensemble” (p. 11) rather than as individual efforts but that, “this is challenging because it is much harder to integrate new tools than simply apply them separately. But the payoffs are immense” (p. 11). Brown (2006) later made a similar observation in the implementation of BCKS and Army Knowledge Online to support leader development and leader teams in the U.S. Army.

### ***Marsick & Watkins - Learning Infrastructures***

Marsick & Watkins (1999) also described the changes the U.S. Army had experienced throughout the last decade and corresponding steps towards becoming a learning organization. Marsick & Watkins also foreshadowed the changes needed in the future for leader development and learning similar to Brown (2000), specifically highlighted Army wide learning and “a new learning infrastructure that would meet people in the field” (p. 67) and then further defined that:

Learning infrastructure consists of all those activities that promote individual, team and organizational learning and knowledge creation. It also includes the systems and policies that need to be in place to support learning and link it to business goals and processes. (p. 69)

Marsick & Watkins (1999) subsequently define action learning within that structure as when, “people focus on learning from real life problems while they act” (p. 138) and that “leaders must provide a safe space in which people can take on new behaviors and realize that it is expected that they take on the status quo” (p. 159). These two foundational principles would become important a decade later at USEUCOM Headquarters where the Commander, General John Craddock, would have to provide both the security and impetus to cross traditional boundaries for the successful implementation of Teams of Leaders (Brown, 2009).

### ***Garvin and Learning in Action***

Finally, Garvin (2000) *Learning in Action: Putting the Learning Organization to Work* proposed the means to apply the concepts of the learning organization from concept to practice. He defined the learning organization as “an organization skilled at creating, acquiring, interpreting, transferring and retaining knowledge and at purposefully modifying its behavior to reflect new knowledge and insights” (p. 11) through the application of three stages of organizational learning; the ability to acquire, interpret and apply information (p. 20). These learning stages occur constrained by “learning disabilities” (p. 28), which Garvin identified as, “biased information” (p. 28) or “flawed interpretation” (p. 31) or “an inability or unwillingness to act on new interpretations” or “inaction” (p. 33).

Garvin offered three recommendations to overcome organizational learning disabilities, learning forums, shared experiences, and exploratory assignments. First, learning forums included “activities and events whose primary purpose is to foster learning” (p. 191) and “shared experiences to put managers and employees through learning process that mimics ones they have personally experienced” (p. 196). Finally, exploratory assignments were when “results can be achieved simply by bringing together participants around a common challenge and setting aside enough time and space so real thinking can occur (p. 194).

Garvin did not include a methodology to overcome the learning disabilities, but his research served as pioneering work for the future application of the leader team exercise. His three recommendations were applicable in both formal structured learning at training centers or in hasty application within tactical training or combat operations in the field (Brown, 2006). Finally, exploratory assignments was similar in design to the vignette approach described by Cox et al (2002) and employed by the IBCT at Fort Lewis.

## **Foundation in Adult Education**

This section provided a short overview of the foundational adult education theories and principles as part of the Army Transformation experience and efforts to change its culture, how leaders learn given new adversaries, and technology of the 21st Century. The U.S. Army had a long history with adult education that traced back to the earliest days of the last century as noted by Captain Adolf Von Schell (1933), an exchange officer from Germany serving with the Infantry at Fort Benning, “the fundamental difference between the American Army and most of those in Europe is that in America, the role of teacher occupies the foreground of attention” (p. 91).

This earlier observation by a visiting German captain echoed later with the same foundation of education and leader development as cornerstones to General Shinseki’s Army Transformation initiative almost 70 years later (as cited in King, 2008). However, with an organization as large as the U.S. Army and the complexity of the changes over the last several decades, a relationship could be made to almost all facets of adult education. For example, the relationships among leader team members from the United States and Eastern European at USEUCOM observed by Brown (2009) would relate to Perry’s (1999) dualistic thinking by college students or transformational learning researched by Mezirow (2000), but these were not included since they were related to individual learning and development as opposed to team learning.

Therefore, the literary review focused on adult learning as related to ToL and the LTX in three general areas. First, was an overview of the key areas of Brookfield’s work as a practitioner and theorist on adult education. He didn’t necessarily focus on teams, but did investigate classroom conditions, which parallel in many ways the leader team environment described by Brown (2006, 2009). Specifically Brookfield’s democratic classroom, critical

thinking, and the role of power and voice, which intersects with security and not unrelated to the security needed among teams noted by Edmondson (2012 and Wilson (2007).

Second, since Army Transformation efforts included lifelong learning and was a key components of Brown's (2003) description of the second training revolution in 1990s, self-directed learning will be considered. The body of knowledge was expansive, so self-directed learning was centered on the peer to peer and team learning since it was a realistic assumption that the U.S. Army incorporated self-directed learning principles into its educational programs.

The role of adult motivation to learn was also considered, but again the body of knowledge was expansive. The review would center on intrinsic motivation to participate and the extrinsic motivation to change (Wlodkowski, 2008; Ryan & Deci, 2000a, 2000b). Since ToL was intended to push across traditional cultural and organizational boundaries as described by Bradford & Brown (2008), team members must have both the intrinsic motivation to move beyond personal comfort zones along with the extrinsic motivation to support their own and others objectives and requirements. Finally, there was a brief discussion on the interplay between the LTX and revolutionary leadership.

### ***Brookfield and the Democratic Classroom***

Although Brookfield did not conduct specific research on teams, his years as a practitioner, and theories for educators, provided a solid adult education foundation for Teams of Leaders and the LTX in generating shared qualities among team members. Specifically, Brookfield's concepts on voice, security, and shared power had implications on the designed outcomes of the LTX to generate SKA among leader team members. Brookfield's democratic classroom was designed to generate discussion, respect differences, and address conflicts openly in a similar manner that a democracy governs society (Brookfield, 2005). In doing so he

proposed three elements that must exist in a democratic classroom (2013); multiple voices and perspectives, decision making processes, and “incorporating unfamiliar perspectives” (p. 127) based on the experience level of the learners (p. 130).

These democratic principals had significance inside the leader team environment as well, where hierarchical power could be more distributed, especially among leader teams constructed of members from joint military services, inter-agency partners, inter-governmental partners, and multinational organizations (Brown, 2006). These diversified groups potentially could replicate the diversified classroom described by Brookfield & Preskill (2005) on making shared trust and shared understanding generated by the LTX equally important. For example, Brookfield & Preskill (2005) wrote:

In choosing how we wish others to think of us, we can explore how identifying with a particular class or culture influences our behavior, language, and attitudes. We start to think how we can show respect for different cultures and what words and actions might be interpreted as disrespectful. (p. 128)

Facilitating discussion through the use of a vignette to discover lessons learned during the after action review or to share a commander’s intent to generate shared understanding is a fundamental component of Teams of Leaders first described by Brown (2000) and later observed by Cox et al (2002) at Fort Lewis, Washington. Brookfield’s discussions occurred in the classroom, but the principles were the same where the teacher was the coach and sharing voice and power were a fundamental goal to expose diversity and voice (2013; see also Page, 2007).

Brookfield described in *The Skillful Teacher* (1990) some speculative guidelines that, “by its very nature discussion is unpredictable” (p. 102) and in summarizing how to facilitate discussion, described a classroom situation that could just as easily describe a deliberate or hasty LTX in action:

When conducted authentically, discussion is not an easy, soft option. It is intellectually taxing and emotionally unsettling. It requires participants to attend carefully to what others are saying. It places the responsibility for the success of the activity in the student's hands as much as the teacher's expertise, for even the most animatedly enthusiastic and well informed leader can do little if students steadfastly refuse to respond.

Students have to present their ideas as clearly as possible, respond thoughtfully to others reactions to these, and interpret other student's ideas, which may be expressed in highly personalized, ambiguous ways. And they have to do all this in an atmosphere that may be highly competitive and without a chance at rehearse contributions so they come out smoothly and confidently. Small wonder, then, that participating in sprawling, wayward, emotionally charged activity we know as discussion represents for many students and teachers their most memorable college experience. (p. 114)

The comparison between changes in Adult Education and the acceptance of the principles of the Democratic Classroom (2013) were not unlike the third training revolution described by Brown (2003). When learning was centered on collaboration, whether in the form of leader teams, professional forums or classrooms, the most current ideas by Brookfield's (2013) democratic classroom were necessary to achieve the voice, which allowed sharing and learning to occur. Furthermore, Brookfield recommended that teachers reflect on their teaching in two books, *The Skillful Teacher* (1990) and subsequent work five years later, *Becoming a Critically Reflective Teacher* (1995) stating in the preface of the second book:

Critically reflective teaching happens when we identify and scrutinize the assumptions that undergird how we work. The most effective way to become aware of these assumptions is to view our practice from different perspectives. Seeing how we think and work through different lenses is a core process of reflective practice. (p. xiii)

Both Senge (2006) and Wilson (2007) had, like Brookfield, observed that learning and operating in high performing teams required the same critical reflection as teachers in the classroom. Brookfield (1990) stated that teachers, like Wilson (2007) had proposed for action racing teams, would benefit by seeing themselves in action through the use of video or similar media. By observing their own behaviors, teachers and team members could “surface their tacitly held beliefs, identify pernicious habits, and discuss obstacles that may be undermine their ability to adapt and perform in challenging contexts” (p. 196).

Finally, Brookfield (2013) observed the role of power in the classroom and offered solutions on how to manage both the positive and negative aspects teaching adults. He stated that power, despite a teacher’s best efforts, cannot be fully distributed and must be accounted for to ensure its proper application to support learning (2013). Power, similarly translated into the ToL environments where underlying authoritative relationships, established or unknown, can result in barriers to collaboration (Brown, 2009; White House Archives, 2006). The role of power will require more research in the future to fully understand the new concepts offered by Brookfield (2013) and its applicability to Teams of Leaders.

### ***Self-Directed Learning***

The importance of self-directed learning is clearly stated upfront in a 2002 white paper on the Objective Force, which stated:

Throughout their careers, Soldiers play a greater role in their own professional development, by keeping pace with changing operational requirements, new technologies, common weapons platforms, and evolving doctrines. Soldiers are supported throughout their career by the institutional learning base as they transition from assignment to assignment, and progress from lower to higher rank. (p. 9)

As discussed earlier, the role of APFs, a series of Army sponsored communities of practice, and a key component of BCKS served as catalyst for development of self-directed learning in the U.S. Army. Professional Forums provided a valuable resource to assist leader teams by providing virtual access to peers in order to obtain critical knowledge in action (Brown, 2006). A team from West Point (Dixon, et al, 2005) studying Professional Forums concluded they could support the Army by “creating expert knowledge, and teaching it to each other, and applying it must be woven into the very fabric of who we are as professionals” (p. 180) implying self-directed learning as a fundamental professional value if not obligation. Furthermore, the integration of Army knowledge management as part of Teams of Leaders (Brown, 2006) and emerging Mission Command Doctrine (Army Doctrine Publication 6-0, 2012), both within and outside of academic environments, further enabled self-directed learning as part of the operations process, to include the directed task to “build cohesive teams through shared trust” (p. 2).

### ***Adult Motivation to Learn***

The connection between motivation and learning was well researched within Adult Education, which certainly extends to team learning and performance. Wlodkowski (2008) commented that “intuition and common sense are often based on tacit knowledge, unarticulated understanding, and skills operating at a level below full consciousness and learned within our culture groups, such knowledge can mislead us” (p. 4). Brown (2009) argued that those characteristics can become amplified among leader teams operating in complex environments such as those faced by USEUCOM required approaches such as the LTX.

In addition, Ryan and Deci (2000a) implied that internal motivation factors also apply in team or group settings since participation cannot be forced and requires a degree of intrinsic motivation which is more than a personal characteristic, but a social one as well:



Although, in one sense, intrinsic motivation exists within individuals, in another sense intrinsic motivation exists in the relation between individuals and activities. People are intrinsically motivated for some activities and not others, and not everyone is intrinsically motivated for any particular task. (p. 56)

Furthermore, Ryan and Deci (2000b) also observed that adults have a basic psychological desire to engage in activities that interest them, which served as the underlining foundation for learning. One could assume this would involve those working in teams since they (2000b) also note that human psychology was further influenced by the basic need for social inclusion within an environment of “autonomy, competence, and relatedness” (p. 14). As external rewards influenced team members, there was an associated level of influence on intrinsic motivation (2000b).

Not all extrinsic-based rewards exhibited the same influence on intrinsic motivation and a basic hierarchical framework developed by Ryan and Deci (2000b) based on how the reward is perceived, as either controlling or informational, was developed and useful in understanding the influence on internal interpretation and effect on motivation (p. 14). If a reward was perceived by an individual as a controlling device used to drive behavior than research demonstrated a decreasing corresponding effect in internal motivation (2000b). This degradation in internal motivation was observed even if the task was initially interesting and desirable before the award was presented (2000b). Ryan and Deci’s work was significant since it demonstrated psychological implications to team performance beyond task performance alone. The perception of shared team qualities of trust, understanding, confidence, and competence described by Brown (2002, 2006, 2009) and Prevou et al (2009, 2011) implied implications in the human dimension supportive of Brown’s (2003) description of a third training revolution and further testing of the LTX.

### ***Revolutionary Education***

The connection between ToL and the use of the LTX as an educationally liberating force was not an obvious one or even necessarily a central theme, but there was an association worth mentioning. In Paulo Friere's book *Pedagogy of the Oppressed* (1993), he discussed the role of revolutionary leadership to education of the poor in order that they might understand their condition:

A revolutionary leadership must accordingly practice co-intentional educational education. Teachers and students (leadership and people), co-intent on reality, are both Subjects, not only in the task of unveiling that reality, and thereby coming to know it critically, but the task of re-creating that knowledge. As they discover themselves as its permanent re-creators. In this way, the presence of the oppressed in a struggle for their liberation will be what it should be: not pseudo-participation, but committed involvement. (p. 27)

At USEUCOM, application of Teams of Leaders, including the LTX, was a means to bridge the cultural barriers with the Former Soviet Bloc Nations in Eastern Europe to establish shared understanding and trust (Brown, 2009). The LTX was seen as a tool to relate across cultural boundaries for shared discovery to solve issues and challenges. ToL was acknowledged as an important contributor:

The collaboration processes of ToL can transcend national boundaries as that national bureaucracy wishes. ToL can be molded to enhance collaboration whatever the local jurisdictional boundaries, reinforcing important allies' collaboration as they draw on ToL to improve the effectiveness of their support to NATO. (p. 5)

The last component offered a connection to building the trust among the oppressed and their oppressors to find innovative solutions as a leader team, or at least a shared vision for the

future. Maybe not as dramatic, but the LTX might offer a tool for local communities to improve their lives or those of others they seek to help. In this case, the question becomes the means to establish the necessary trust between the teacher and the subjects and a common shared vision or understanding from which to take action. The LTX may offer a means to teach without directing and share power through the use of a model or vignette. However, there are risks in taking such a relationship too far since as it is evidence in the book by Horton & Friere (1990), *We Make the Road by Walking*, the authors were seeking social movements and change well beyond the scope or intent of ToL or the LTX.

### **Summary**

This chapter discussed the foundational theories, history, and concepts for ToL and an overview of Team and Adult Education literature as a foundation for further investigation on the impact of the LTX on team learning and performance. There are similarities among the bodies of knowledge on the need to generate trust, and shared vision in a secure environment to generate and promote learning. The classroom teacher (Brookfield, 1990, 1995, 2013), corporate team coach (Hackman, 2002, 2010, 2011), and leader team member (Brown, 2006, 2009; Bradford & Brown, 2008) all have varying degrees of expertise, barriers to learning, and recommendations on overcoming them. The LTX offered potential as a structured approach within multiple domains, but especially among teams that must learn quickly, but consist of members who are less experienced or faced with unique challenges or new opportunities.

## **Chapter 3 - Methodology**

### **Introduction**

This chapter describes the research methodology, which includes research questions, design, procedures, participants, and data collection and analysis. The study used a quantitative based experimental approach to conduct an initial investigation on the effects of the Leader Team Exercise (LTX) on team performance, shared understanding and confidence. The study pioneered formal research based on observations from the field in the use of the LTX by teams at U.S. European Command (USEUCOM) Headquarters in Germany. The study intended to test the use of the LTX as a means to improve learning and performance within a more controlled environment by assessing teams conducting training at a Field Leaders Reaction Course (FLRC) located on Fort Riley, Kansas. The FLRC allowed for the isolation of the LTX from environmental variability in order to determine a level of influence on teams constructed from a Kansas Army National Guard Artillery Battalion.

### **Research Questions**

This study plans investigated the following research questions stated as null hypothesis:

H1<sub>0</sub>: There is no relationship between the dependent variable, team performance, and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

H2<sub>0</sub>: There is no relationship between the dependent variable of shared understanding and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

H3<sub>0</sub>: There is no relationship between the dependent variable of shared confidence and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

H4<sub>0</sub>: There is no correlation between dependent variables team performance, shared understanding, and shared confidence in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

H5<sub>0</sub>: There is no correlation between dependent variables team performance, shared understanding, and shared confidence with the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

### **Design of the Study**

A within-subjects randomized experiment or crossover design was employed for the experiment. A within-subjects design was chosen over a between subjects design because no initial data existed to develop assumptions about data normalcy or distribution of responses both before or after treatment to compared results from those of an independent control group (Field, 2013; Gliner, J. A., Morgan, G. A., & Leech, N. L, 2009). As a within-subjects design, the sample served as their own control group baseline normalcy of the participants prior to the introduction of the LTX as a treatment and assessment. Therefore, the sample established baseline data of a normal response to negotiating the FLRC prior to the introduction of the LTX as a treatment and after treatment negotiating a different set of obstacles.

A within-subjects design was appropriate since the design reduced error variance between the normal distribution likely present throughout the population and the variance among the sample group. In addition, the within-subjects design also maximized the exposure of the participants to the treatments and the benefits of learning the LTX. See Table 3.1 Layout for the Within-Subjects Randomized Experiment / Crossover Design Experiment for an overview of the experimental design.

**Table 3.1 Layout for the Within-Subjects Experiment / Crossover Design Experiment**

|   |            |          |            |                      |           |             |           |
|---|------------|----------|------------|----------------------|-----------|-------------|-----------|
| R | Test Group | Pre-Test | C1 (Set 1) | Post-Test / Pre-Test | Treatment | X1 ( Set 2) | Post-Test |
| R | Test Group | Pre-Test | C2 (Set 2) | Post-Test / Pre-Test | Treatment | X2 (Set 1)  | Post-Test |

Moreover, the role of leadership experience proved an unpredictable, uncontrollable variable resident throughout the population and was difficult to measure. Since prior leadership experience was not controllable, the within-subjects design established normalcy in the sample inclusive of prior leadership, reducing potential error in the results. The within-subjects design results were very unique to the battalion reducing overall generalizability, however, the design still allowed for sufficient evidence to support initial research in assessing. The assessment was possible because the study did not try to generalize the amount of change caused by the LTX, but only that a degree of change had occurred with a degree of confidence that the change was in fact due to the treatment.

One weakness of the within-subjects design was the risk of a carryover effect from the initial exposure to the experiment, in this case the FLRC, and participants influenced by the training influencing results during the second exposure (Gliner, et al , 2009). In order to mitigate the risk of a carryover effect, each team completed three FLRC stations prior to treatment and then did a crossover and completed three different stations after treatment. The station change meant that no team was evaluated on the same station twice, nor did any team have insights on a solution prior to negotiating it. An additional FLRC station was used for training to further

mitigate any risk of a carryover effect while learning the LTX or preparing to negotiate the first or second Sub Sets.

### **Procedure**

The experiment was conducted on June 18, 2013 at the FLRC on Fort Riley, Kansas. The 161st Artillery Battalion, Kansas Army National Guard was conducting their annual two week training exercise at Fort Riley, which was the unit's only event throughout the year where the entire battalion was co-located physically at the same location. The Battalion's annual training was conducted from June 8th through June 23rd and the unit incorporated the experiment into their training schedule as a planned leadership development event. See Appendix B for a copy of unit's approval memorandum and Appendix C for the Kansas State University Institutional Review Board approval memorandum.

In addition to the battalion's members who participated in the experiment, there were three additional groups which provided support for the study. The first group consisted of seven controllers, also from the battalion, to monitor the FLRC stations. Their role was to read the FLRC station instructions, to ensure safety procedures were followed, and to facilitate movement of the teams between stations. The other significant responsibility for controllers was to serve as time keepers and data collectors for each team negotiating their assigned station. The second group consisted of three observers who conducted quality control and monitored the teams as they applied the LTX to ensure the accuracy and reliability of application in accordance with the LTX training. Observers had previously received LTX training prior to the experiment, as well as, a rehearsal and group testing to ensure inter-observer reliability and standardization. The final group was a support staff, which included members of the battalion and volunteers to help set up the FLRC, provide administrative support and handling of the paper surveys throughout

the experiment. This group also performed data coding during collection and transfer to Microsoft Excel spreadsheets to ensure accuracy was maintained.

The experiment started at approximately 6:00 A.M. at the FLRC with the controllers, observers and support staff arriving to set up the site. Immediately following a review of the timeline, a review of evaluation guidelines was conducted for each stage of events using the FLRC Station #1 “Mine Crossing.” This included a rehearsal of grading procedures by the controllers for each of the stations along with observers to insure inter-observer reliability. Each controller and observer was provided a copy of the LTX Experiment FLRC Guidebook in Appendix D. The LTX Experiment FLRC Guidebook included instructions for each of the FLRC stations, mandatory safety procedures and a data collection worksheet in order to standardize collection. An overview of the LTX was also included for the observers to assess its application by the teams. Finally, during the rehearsal, a review of the LTX Experiment FLRC Guidebook and data collection was conducted for all controllers and observers.

At approximately 8:00 A.M. members from the 161<sup>st</sup> Artillery Battalion arrived at the FLRC site and received a range control and safety brief in accordance with Fort Riley, Kansas policy. At this point, each participant was briefed on the voluntary nature of the experiment and asked to sign the informed consent form included in Appendix E. The participants were organized into 11 teams by the Battalion commander and randomly assigned into either Test Group A or B based on predetermined sample clusters. Finally, the participants were asked to complete a FLRC Participant Form requesting the subject’s age, gender, rank, years of service along with any prior experience at the FLRC as shown in Appendix F and completed the initial pre-test survey as shown in Appendix G. Starting at 8:30 A.M. the teams moved to their initial FLRC Sub Set starting point and spent an hour negotiating the first set of obstacles, which



included three stations, prior to returning to the FLRC Marshalling Area for LTX training. The initial stations were based on test groups with Group A completing Sub Set #1 which included stations 4, 5 and 6 and Test Group B completing Sub Set #2, stations 7, 8 and 9 in order to establish control data as a baseline for all six stations used during the experiment.

Upon completion of the initial Sub Sets, all teams returned to the FLRC Marshalling Area, completed an mid-test survey to capture control data. Immediately following the mid-test survey, participants received approximately one to one and a half hours' worth of instruction on the LTX. Dr. Michael Prevou, an expert on the LTX, provided instruction based on the curriculum used in previous applications by action teams in the field. At the time of the experiment, he had more experience as an LTX trainer than anyone else with over 1000 hours providing instruction to a wide range of audiences. Dr. Prevou focused the training on how to employ the LTX in a hasty environment, which included time for practice, coaching, and feedback from the instructor to the teams.

After the treatment, the Test Groups switched FLRC Sub Sets with Test Group A completing Sub Set 2 and Test Group B completing Sub Set 1 with the additional requirement that they must use the LTX to support the team's negotiation of the obstacles. Controllers measured team performance using the same criteria as during the initial rotation and observers ensured the proper application of the LTX was employed. The teams had no prior exposure to the new FLRC stations or knowledge of the LTX prior to the training in order to reduce the risk of a carryover effect. At the conclusion of the second rotation through the stations, the teams re-assembled at the marshalling area and completed a post-test survey to capture feedback from the teams completing FLRC stations employing the LTX. The battalion commander, along with the LTX trainer, led an After Action Review (AAR) in accordance with the unit's standard operating

procedures and the U.S. Army's 2011 manual *Leaders Guide to the After Action Review*. The unit conducted an AAR to identify lessons learned on the course, training, and LTX. Observers captured comments related to the experiment, but otherwise did not participate in the unit's AAR.

## **Instruments**

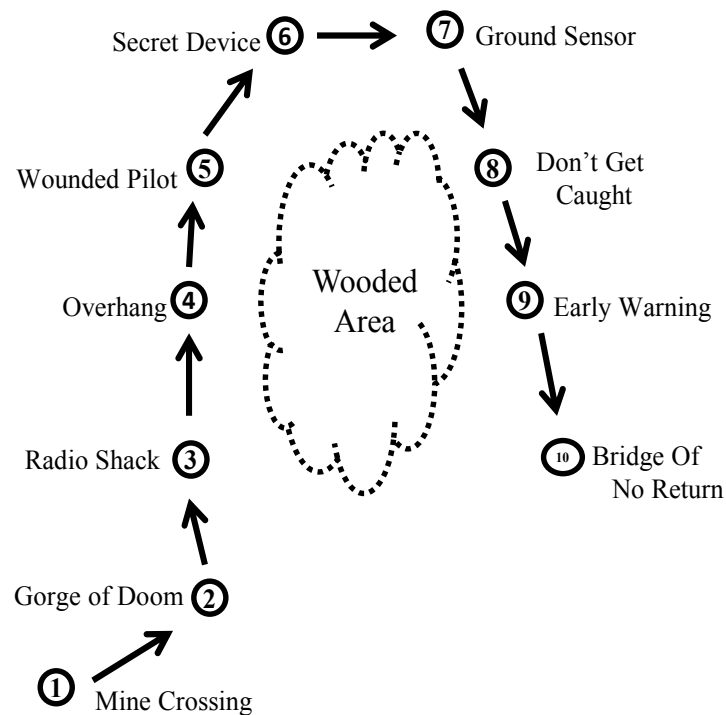
### ***The Leadership Reaction Course***

The Leaders Reaction Course was developed during the first half of the 20<sup>th</sup> Century initially as a pre-World War II officer evaluation tool by the German Army and then later adapted and further developed by the British and United States Military in the 1950s and 1960s. The course, in addition to developing leadership skills was also designed to “test teamwork and problem-solving skills” (Ham, 2009). The Leaders Reaction Course is widely used throughout the United States and is popular with the Reserve Officer Training Corps (ROTC) and according to the Utah National Guard manual on procedures to operate a Leaders Reaction Course at Camp W. G. Williams, the purpose is:

- (1) To improve the student's leadership ability by affording the student an opportunity to apply the lessons learned in his formal leadership instruction.
- (2) To assess the student by measuring the degree to which certain leadership traits and behaviors are possessed by the students.
- (3) To provide the student with a means of making a self-evaluation to determine more accurately his leadership ability.
- (4) To provide students the opportunity to observe the effects of strengths and weaknesses of others during a team operation.
- (5) To develop individuals as leaders.

The FLRC at Fort Riley, Kansas was consistent with the common design of Leaders Reaction Courses throughout the U.S. Army. The Fort Riley Course consisted of 10 stations organized in a semi-circular pattern as depicted in Figure 3.1 Field Leaders Reaction Course (FLRC) Design Layout with each station designed to test leaders as they negotiate a challenge or obstacle.

**Figure 3.1 Field Leaders Reaction Course (FLRC) Design Layout**



The FLRC was located on the north side of Fort Riley, Kansas adjacent to the barracks and unit headquarters of the 1<sup>st</sup> Infantry Division which allowed for easy access to the training site. The FLRC was managed and maintained by the Fort Riley, Kansas Range Control, which is a subordinate office to the Directorate of Plans, Training, Mobilization, and Security.

Coordination with Range Control was conducted in order to ensure proper usage and safety of

the FLRC for the experiment. The site was also within close proximity of the Irwin Army Community Hospital on Fort Riley, Kansas and was capable of providing medical care for the participants and support staff had there been an emergency.

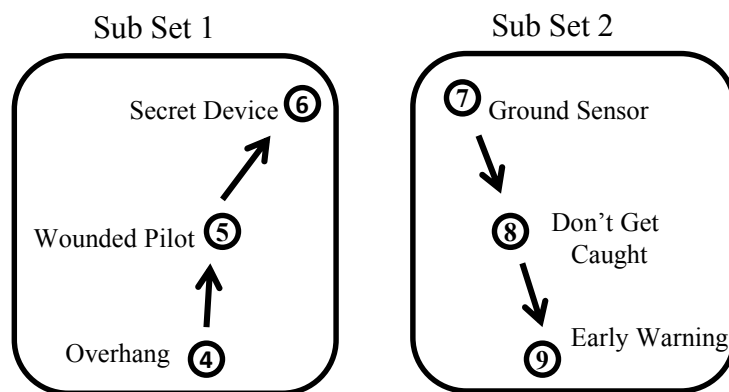
The FLRC provided a useful instrument to test the effect of the LTX by creating a standard uniformed assessment tool to measure team performance based solely on basic leadership skills. The FLRC helped to reduce potential influence of external individual expertise or experiences that may have been present in field settings and potentially introduce bias into the experiment. Although leadership competencies cannot be completely mitigated, the FLRC created a standard challenge not seen before and reduced variance through the use of explicit performance metrics, mainly time, that remained constant from one team to another regardless of a team member's experience. For this experiment, nine of the 10 stations were used. Station Number 3, the Radio Shack, was not used since it did not meet the necessary criteria of explicit performance metrics to objectively measure performance.

The first station, called the "Mine Crossing" was selected as a practice or rehearsal station for the support staff and teams to demonstrate proficiency or practice the LTX throughout the experiment. The Mine Crossing station was selected as a training site primarily because of its central location to the marshalling area and convenient access by the teams and support staff. A secondary reason for selection as a training site was its general visibility throughout the marshalling area, which allowed teams to observe others negotiating the obstacle thus potentially influencing the results.

In addition, six stations were selected and divided into two groups identified as Sub Set #1 and Sub Set #2. These Sub Sets provided the framework for the two test groups identified as Test Group A and B to negotiate the obstacles both before and after treatment. Figure 3.2 shows

the layout of the FLRC stations with the alignment of the six stations into the Sub Sets to support the experiment. Sub Set #1 included stations four, five and six located on the western side of the FLRC training area depicted by the first box and Sub Set #2 included stations seven, eight, and nine were located on the eastern half of the course and shown by the box on the right.

**Figure 3.2 Test Group and Sub Set Alignment**



The stations were primarily selected based on two criteria. The first criteria was station location as describe above with each station adjacent to at least one of the other stations in the set. A second criteria was the ability to create a standardized measurement in the completion of the challenge. For example, as previously mentioned, “The Radio Shack” was not used in the experiment because successful completion of the obstacle was a judgment based on interpretation of the team leader’s decisions. This was the only station that didn’t use time to measure performance and would have increased the risk of inter-observer reliability while also requiring the development of an additional scale to measure performance beyond the scope of the experiment. Station number two, “Gorge of Doom,” and station number 10, “Bridge of No Return,” were not selected primarily because of location and would have become backup stations for Sub Sets 1 and Sub Sets 2 respectively had one of the primary sites become unusable during the experiment.

Finally, as previously mentioned, an LTX Experiment FLRC Guidebook adapted from the Fort Riley, Kansas FLRC Handbook was developed for use by the controllers, observers, and support staff to conduct the experiment. The LTX Experiment FLRC Guidebook included base instructions required by the Fort Riley, Kansas Range Control to ensure safety and proper use of the FLRC, along with instructions on the conduct of the experiment, which supported standardization and uniform data collection.

### ***Teams of Leaders Survey***

The Teams of Leaders (ToL) Survey was developed at the Battle Command Knowledge Systems in an effort led by Dr. Michael Prevou and accomplished in coordination with Brown (2006), Lipnack and Stamps (1994, 1997, NetAge.com) and other military leaders who all have varying degrees of expertise on teams in government, industry, and military settings. The ToL Survey was specifically developed for use by the Army and consists of seven different sections designed to measure different skills, knowledge, and attributes originally defined by Brown (2006). The survey also included sections to measure knowledge management and information management skills team members possess. All the sections together provide a comprehensive overview for the broader ToL concept. The survey was also used to measure four shared qualities in and among team members generated while completing an LTX during field observations. These shared qualities included shared trust, understanding, confidence, and competence all considered necessary for higher levels of team performance (Prevou, et al, 2009, 2011).

The survey consisted of a five-point Likert Scale to capture individual team member's perceptions on the seven different areas. The five-point Likert scale was considered sufficient to generate measurable data sufficient to interpret the results (Fields, 2013). The survey was

designed for use in both a deliberate and hasty team environment while simultaneously supporting measurement of the LTX. The ToL survey was tested and validated in multiple field settings to include the EUCOM Headquarters, the U.S. Army's 4<sup>th</sup> Brigade, 1<sup>st</sup> Infantry Division along with multiple groups from the Central Michigan Health community and more recently Team Rubicon (Prevou et al, 2009, 2011; Prevou, personal communication, January 25, 2013 & March 12, 2014). The ToL Surveys provided consistent results in field settings when measuring shared team qualities generated while conducting the LTX, but lacked baseline data captured within a controlled experimental design setting. The ToL Survey was the only survey tool specifically designed for use with the LTX.

Because the experiment only tested two of the four shared qualities through the ToL survey, the study only employed a portion of the complete ToL Survey for this research. The sections on knowledge management and information management were excluded since neither area was tested and not relevant to assessing the LTX as an independent variable. In addition, survey questions about shared competency were also removed from the survey and assessed separately through team performance while conducting the FLRC. Questions designed to assess shared trust were also excluded since trust was not measured. Sections on shared understanding, confidence were used with slight modification to adjust the questions to tailor for clarity by including terms used at the FLRC. For example, questions that infer longer periods of time were adjusted for the short timelines of the experiment, but otherwise the meaning was not changed. Questions 1-7 were used to assess levels of shared understanding and questions 8-15 were used to assess shared confidence and a copy of the survey used for the study is included in Appendix G.

The participants completed the survey three times during the experiment consistent with a within-subject design (Gliner, et al, 2009). The first one was a pre-test survey administered to each participant prior to teams negotiating the initial sub set of stations. A second interim or mid-test survey was completed upon completion of the initial subset obstacles to establish baseline results for use as control group data, as well as, a baseline to measure differences after teams completed the second subset of obstacles during the second time period. A final survey or post-test survey was administered when teams completed the second sub set of obstacles and prior to the unit's after action review. The surveys were labeled as pre-test, mid-test and post-test and an example of the two sections of the ToL survey used for the study is included in Appendix G.

### **The Population**

The population for this research was the 483 members of the 161st Artillery Battalion, Kansas Army National Guard. The unit was further organized into six subordinate company sized elements that were stationed throughout the state of Kansas. See Table 3.2 for the battalion's organization and authorized strengths.



**Table 3.2 161st Artillery Battalion, Kansas Army National Guard Authorized Strength**

| Unit                              | Authorized Strength |                 |          |           |
|-----------------------------------|---------------------|-----------------|----------|-----------|
|                                   | Officer             | Warrant Officer | Enlisted | Aggregate |
| Headquarters Battery              | 15                  | 2               | 73       | 90        |
| Battery A                         | 5                   | 0               | 64       | 69        |
| Battery B                         | 5                   | 0               | 64       | 69        |
| Battery C                         | 5                   | 0               | 64       | 69        |
| Battery E                         | 1                   | 2               | 45       | 48        |
| 116st Forward Support Company (-) | 5                   | 1               | 129      | 135       |
| Battalion Totals                  | 36                  | 5               | 439      | 480       |

The overall battalion personnel end strength was 100.63% with 482 assigned personnel, slightly over the 480 positions allocated within the battalion's personnel roster. The distribution was not equally divided among the subordinate batteries and company sized units with the highest strength at 110.81% and the lowest overall strength at 77.08%. See Table 3.3 for the breakdown of actual personnel assigned strengths. The table also highlights the officer, NCO and enlisted soldier densities of each unit.

The battalion's personnel demographics were approximately 98% male, 2% female with all the female soldiers assigned to the 116st Forward Support Company. Ethnic diversity was approximately 70% Caucasian and 30% mix in composition of other ethnicities. All members of the unit volunteered to serve in the Kansas Army National Guard.

**Table 3.3 161st Artillery Battalion, Kansas Army National Guard Actual Strength**

| Unit                              | Officer | Warrant Officer | Enlisted | Aggregate | % Strength |
|-----------------------------------|---------|-----------------|----------|-----------|------------|
| Headquarters Battery              | 11      | 0               | 75       | 86        | 95.6%      |
| Battery A                         | 3       | 0               | 69       | 72        | 104.3%     |
| Battery B                         | 5       | 0               | 66       | 71        | 102.9%     |
| Battery C                         | 5       | 0               | 69       | 74        | 107.2%     |
| Battery E                         | 1       | 0               | 36       | 37        | 77.1%      |
| 116st Forward Support Company (-) | 4       | 0               | 138      | 142       | 105.2%     |
| Battalion Totals                  | 29      | 0               | 453      | 482       | 100.4%     |

The unit members traveled from their home residences across three states; Kansas, Missouri, and Oklahoma to nine unit armories located throughout Kansas for duty periods that were on average one weekend a month and a two-week annual training period each year. The unit's duty was consistent with routine individual training common to all soldiers and collective training that supported the battalion's mission to provide artillery support to the U.S. Army and Kansas National Guard. The 116st Forward Support Company Detachment was not organic to the battalion, but had a long term habitual relationship to provide logistical support common within the U.S. Army and Kansas Army National Guard.

### **Sample**

The sample for the experiment consisted of 11 teams with 6 participants in each team for a total team size  $n=11$  and a total individual participant size of  $n=66$ . The teams were not constructed based on random selection of personnel, but rather purposefully assigned by the battalion commander based on unit designation in order to take advantage of the FLRC training and the potential benefits of the LTX treatment. The battalion commander had established the 11

teams into three clustered groups and the clusters were labeled as Battery Command Teams, Headquarters, and Headquarters Battery (HHB) Teams and a Battalion Command Team.

### ***Battery Command Leader Teams***

Six of the teams consisted of the battalion commander, his or her Executive Officer (XO) and the unit 1st sergeant. The batteries were commanded by a captain with between 6-10 years of experience with all six of the battery commanders had assumed command within the last year and were new to the position. Battery XOs normally consist of a 1st Lieutenant with less than five years of military experience, is the senior lieutenant within the unit and handles the day to day tasks. The units had experienced XOs who had been in the unit for longer periods of time than the battery commanders and although subordinate to the commanders had more continuity and experience in the unit's mission and operations.

### ***Headquarters and Headquarters Battery (HHB) Teams***

The Battalion HHB consisted of staff and support personnel divided into staff sections, which handled the day to day operations and administration of the battalion. They were designated using an S symbol to indicate staff and a number assigned for their duty type. For example the S1 handles administration and personnel actions similar to a human resources department within a corporation. The four staff sections for this experiment were led by a senior leader with varying number of non-commissioned officers and soldiers.

### ***Battalion Command Teams***

The final team consisted of members from the Battalion's Command Group, which were similar in design to the battery command teams, but obviously with more years of experience. This team included the battalion commander, battalion XO, and command sergeant major with other soldiers assigned to the unit's command group. The additional soldiers provide support

functions for the commander, XO, and sergeant major and were younger and less experienced than their senior teammates.

### ***Sample Test Groups***

The teams were clustered based on the purposeful assignment by the battalion commander with each group then randomly divided in half and then placed into one of two test groups labeled Test Groups 1 and 2. The Test Groups were similar to one another in order to reduce variance when measured as a complete test group. Table 3.4 shows the division and pairing of the clusters into Test Group “Red” and Test Group “Green.”

**Table 3.4 Cluster Sample and Test Group Alignment**

| <b>Sample Cluster</b>                              | <b>Test Group “Red”</b> | <b>Test Group “Green”</b> |
|--|-------------------------|---------------------------|
| Battery Command Leader Teams                       | 3 X Teams (H, I, J)     | 3 X Teams (A, B, C)       |
| Headquarters, and Headquarters Battery (HHB) Teams | 2 X Teams (F, K)        | 2 X Teams (D, E)          |
| Battalion Command Teams                            | 0                       | 1 X Team (G)              |

### **Data Collection**

Data collection occurred on June 18, 2013 at the FLRC course on Fort Riley, Kansas from approximately 8:00 A.M. through 3:00 PM when the training concluded. Two groups collected data. First controllers at each of the obstacles collected the total time in seconds of each team as they negotiated the various obstacles in Sub Set 1 and Sub Set 2. Second, controllers captured the number of penalties that occurred for each station. Table 3.5 shows both FLRC Sub Sets and the objective measured and associated time penalty for each station. Observers captured performance data on a sheet provided in the LTX Experiment FLRC Guidebook. A copy of the Guidebook is enclosed in Appendix D. The survey data was captured

on 5 x8 inch cardstock and filled out by each participant. The data was then transferred to Microsoft Excel and SPSS for analysis. Observers helped to consolidated data from the surveys to the spreadsheets and validated accuracy during the transfer process.

**Table 3.5 FLRC Sub Sets Objective, Metrics and Penalties**

**FLRC Sub Set 1**

| <b>Station Number</b> | <b>Station Name</b> | <b>Station Objective</b>                      | <b>Metric</b> | <b>Penalties</b>                                     |
|-----------------------|---------------------|---|---------------|--|
| 4                     | Overhang            | Team and ammo crate across the obstacle       | Time          | Team or equipment touches the far side wood beam     |
| 5                     | Wounded Pilot       | Team and wounded pilot over the "ravine"      | Time          | If a team member or equipment touches ground         |
| 6                     | Secret Device       | Team enters compound, steal device and return | Time          | If team touches vertical beam, mines, or booby traps |

**FLRC Sub Set 2**

| <b>Station Number</b> | <b>Station Name</b> | <b>Station Objective</b>                      | <b>Metric</b> | <b>Penalties</b>  |
|-----------------------|---------------------|---|---------------|---|
| 7                     | Ground Sensor       | Move team and 4 boxes over obstacle           | Time          | If team, box, or wood plank touches surface of fence or mine                  |
| 8                     | Don't Get Caught    | Cross double fence with team and ammo box     | Time          | If a team member or timber touches fence, ground, or ammo box is dropped      |
| 9                     | Early Warning       | Team and warning device (box) across obstacle | Time          | If team member enters into off limits area or equipment falls into mined area |

***Data Analysis***

Due to the small team sample size and the inability to make assumptions about normality of the variables, the study uses non-parametric statistical analysis to assess the data. (Fields, 2013, Gliner, et al, 2009). For Research Question 1 the Wilcoxon Rank Sum Test was used to compare performance results in both time and number of errors for each obstacle. The test

required that the data was derived from a continuous distribution available from the within subjects sample (Kraska-Miller, 2014). In addition, the test also takes into account the magnitude of scores by ranking the data (2014). A second Friedman's Randomized Block Design test was used to assess if team characteristics influenced performance looking at three variables of age, military experience and prior FLRC experience.

The Wilcoxon Rank Sum Test was also used to compare changes in survey scores between the three surveys to answer Research Question 2 and 3. The Wilcoxon Rank Sum Test compared data for each question three times. An initial test compared pre-test and mid-test scores. A second test compared a mid-test to post-test scores and a final test compared pre-test and post-test scores. The second test comparing the mid-test to post-test scores was used to determine impact of the LTX as the independent variable with the dependent variables shared understanding and shared confidence. In total the Wilcoxon Rank Sum Test was conducted 45 times to develop data for all 15 survey questions.

The Spearman's Rank-Order Correlation test was used to investigate the correlations between variables in order to answer Research Question 4 and 5. The test was appropriate over parametric approaches such as Pearson's  $r$  because of a lack of assumptions about the linear relationship between variables and the small sample size (Turner, 2014). The Spearman's Rank-Order Correlation test was used to compare the three dependent variables and then conducted a second time to assess if the relationships changed due to the LTX.

### **Protection of Human Rights**

This research was conducted in accordance with the Institutional Review Board of Kansas State University and policies and procedures of the U.S. Army and Kansas Army National Guard. In addition, Fort Riley had specific rules and regulations for the certification of

range officers to guide the conduct of military training which included training at the FLRC. Range officer certification included risk management, medical care, safety and administration, which were all designed to protect the participants training at the site. The conduct of the experiment met all requirements.

### **Summary**

This chapter provided an overview of the research including the research questions, design, procedures, population, samples and data analysis. As initial research on the LTX, the intent of the study was to determine if observations of action teams in the field could be reproduced in a more controlled experimental design environment using the FLRC on Fort Riley, Kansas. The data collected was intended to provided further clarity to observations from the field about the LTX to support additional research in the future.

## **Chapter 4 - Findings**

### **Introduction**

This chapter describes the analysis of results based on the five research questions from the experiment conducted on June 18, 2013 at the Field Leaders Reaction Course (FLRC) at Fort Riley, Kansas. The chapter initially provides an overview of the demographic information collected, which contains information about the sample participant's age, gender, military service and prior FLRC exposure. The information is organized to describe characteristics of both the individual participants and the teams within the experiment to assist in understanding implications from further analysis.

In addition, the chapter also provides a section containing the quantitative analysis of the FLRC performance results based on total time in seconds to complete course obstacles and the number of penalties incurred. Performance data analysis supports answering Research Question 1 concerning the relationship between the dependent variable performance and the Leader Team Exercise (LTX). The data was analyzed by comparing both total time and the number of penalties committed as team negotiated obstacles before and after introduction of the LTX. In addition, the performance between teams was also conducted using average performance scores, total time, and errors. Due to the low team sample size and lack of assumptions about the normalcy, the study employed nonparametric statistical approaches to interpret the data.

A second section evaluates the three sets of survey data collected to investigate relationships between the LTX and participant perceptions of the dependent variables shared understanding and shared confidence. The study interprets the data to answer Research Question 2 and 3 also employing nonparametric approaches. The study conducted a three-way comparison of the surveys to identify significant changes in participant responses pre-treatment



and then again post-treatment. The section also investigates the differences between scores from the beginning to the end of the experiment with all three tests considered to answer the research questions. In addition, the analysis will provide feedback to the Kansas Army National on suitability for inclusion in joint and interagency disaster response training.

A third section in the chapter investigates the relationships between the dependent variables and the LTX to determine if any correlation exists. The study uses the results from the comparisons to answer Research Question 4 and 5 about relationships of variables among teams. The correlations help determine if any significant causality exists among team performance or perceptions of shared qualities. For example, do teams that demonstrate a higher amount of shared understanding by nature exhibit more shared confidence?

A final section includes observations made during the post-training after action review conducted by the unit commander and LTX instructor. Although not officially part of the data collection, the comments provide further information concerning participant perceptions of the experiment and the LTX not obtained through the performance data or surveys. The study does not conduct a qualitative analysis of the participant's comments nor was the information used to assess significance of the research questions, but did offer insights on the results and suggestions for future research discussed in the following chapter.

## **Demographics**

The sample originally consisted of 66 participants from the 483 members of the 161st Artillery Battalion, Kansas Army National Guard. One participant from Team G was lost during the beginning of the experiment as teams began to negotiate obstacles in the first subset due to issues unrelated to the experiment. The sample size was reduced to 65 participants and used for all analysis. No impact was reported by Team G due to the loss of a team member nor was one

perceived by observers during the experiment. Table 4.1 contains the demographics for the participants in the sample.

**Table 4.1 Participant Descriptive Statistics**

|                | Age     | Gender   | Military Service | % FLRC Experience | Year since FLRC Experience |
|----------------|---------|----------|------------------|-------------------|----------------------------|
|                | (years) | (% Male) | (years)          |                   |                            |
| Mean           | 32.985  | 0.98     | 12.8308          | 0.09              | 0.9115                     |
| Median         | 34      | 1        | 11               | 0                 | 0                          |
| Mode           | 28, 41  | 1        | 22               | 0                 | 0                          |
| Std. Deviation | 9.6493  | 0.124    | 8.73135          | 0.292             | 4.00986                    |
| Range          | 37      | 1        | 28               | 1                 | 25                         |
| Minimum        | 19      | 0        | 1                | 0                 | 0                          |
| Maximum        | 56      | 1        | 29               | 1                 | 25                         |

In addition, the participants were organized by the unit commander into eleven teams for a total team sample size of  $n=11$ . The teams represented three clusters within the battalion that included one command, six battery and four Headquarters, Headquarters Battery teams. Teams from each cluster were randomly divided into two groups and assigned a team designation of A through K to identify and manage them throughout the experiment. The descriptive statistics for the teams are shown in Table 4.2 and highlights the same five categories and the participants were organized in each team, labeled as teams A through K.

**Table 4.2 Team Descriptive Statistics**

| Team assignment | Average Age (years) | Gender (% Male) | Military Service (years) | % FLRC experience | Years since last FLRC Experience |
|-----------------|---------------------|-----------------|--------------------------|-------------------|----------------------------------|
| Team A          | 28.67               | 100%            | 9.67                     | 0                 | 0                                |
| Team B          | 29.83               | 100%            | 11.5                     | 0.33              | 8.5                              |
| Team C          | 42.33               | 83%             | 21.5                     | 0.17              | 2                                |
| Team D          | 29.67               | 100%            | 9.5                      | 0                 | 0                                |
| Team E          | 34.67               | 100%            | 13.25                    | 0                 | 0                                |
| Team F          | 32.5                | 100%            | 11.08                    | 0                 | 0                                |
| Team G          | 35.17               | 100%            | 16.42                    | 0.33              | 20                               |
| Team H          | 29                  | 100%            | 9.42                     | 0.17              | 0.25                             |
| Team I          | 33.17               | 100%            | 12.83                    | 0                 | 0                                |
| Team J          | 37                  | 100%            | 15.4                     | 0                 | 0                                |
| Team K          | 31.5                | 100%            | 11                       | 0                 | 0                                |

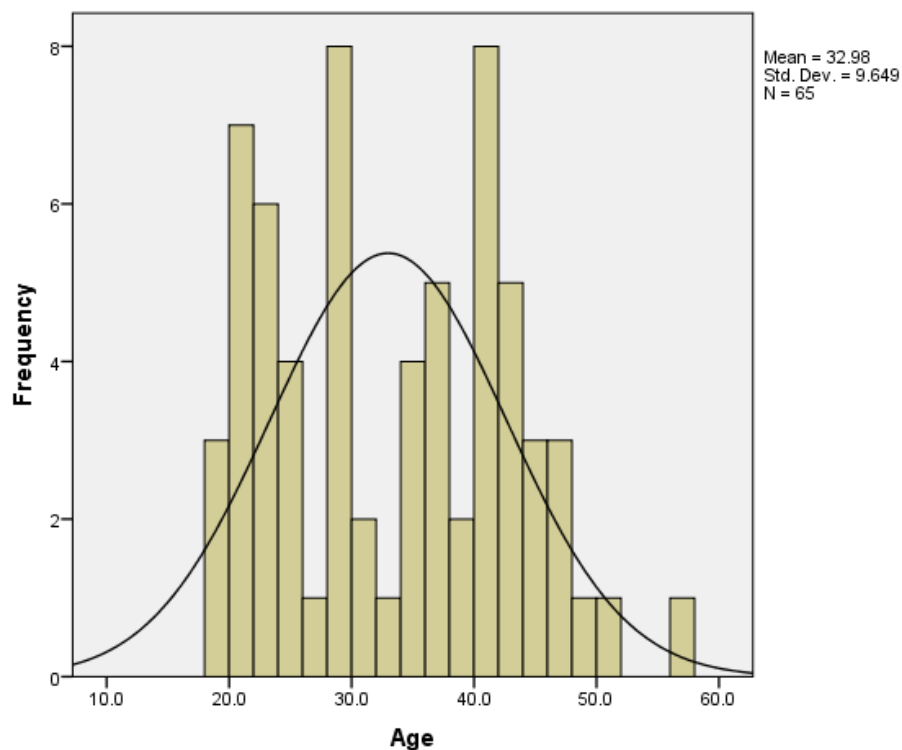
### *Age*

Sample ages for participants ranged from 19 to 56 years old with an average age of 32.98. The median age was 34 and a mode age of 28 and 42 years old. Average ages for teams ranged from a youngest at 29.00 years old for Team C to the oldest at 42.33 years for Team G. Table 4.1 contains the average age of teams who participated in the experiment. The ages were normally distributed, but somewhat clustered around one standard deviation on both sides of the mean at 23.331 and 42.629 respectively with only one participant at age 56 two standard deviations from the mean. Table 4.1 shows the descriptive statistics and the histogram in Figure 4.1 shows the distribution of the participants based on age.

The existence of two modal scores of 28 and 41 indicated a bimodal distribution, which became apparent through the histogram and was more reflective of the sample's demographics than the mean or the median representation within the unit. Overall, 28 of the 65 participants, or 43% of the sample, were under the age of 30. In addition of the remaining 57% the next largest

group of participants were over the age of 40 at 23 or 35.5%. Finally, the smallest group consisting of only 14 participants, or 21.5%, were in their 30s. Age distribution assisted in understanding individual years of military service, which were highly correlated and considered during analysis of the data.

**Figure 4.1 Participant Age Histogram**



### ***Gender***

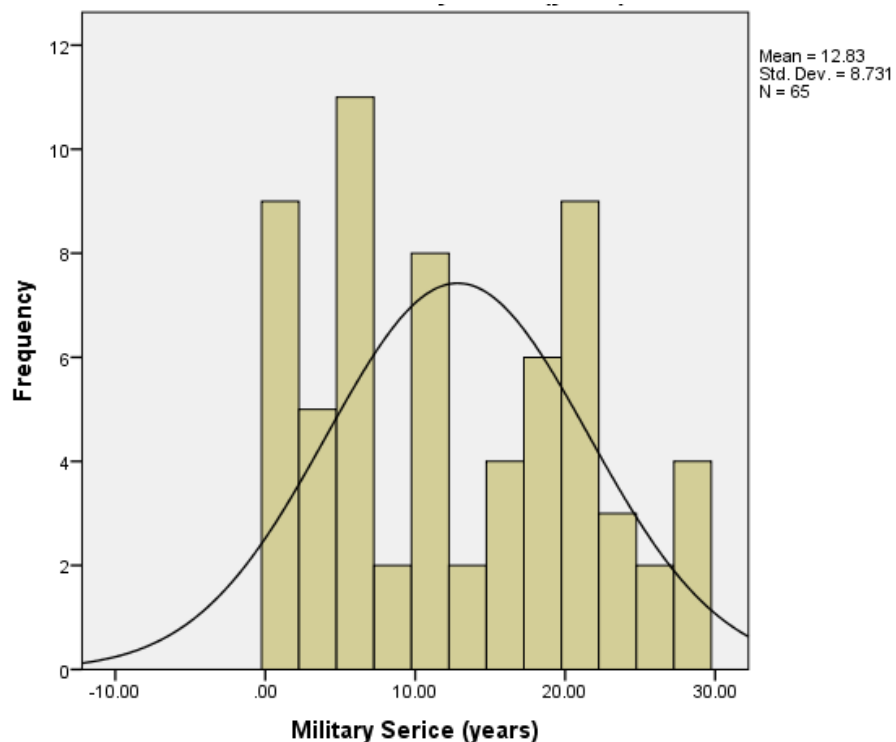
The sample was overwhelmingly male at 99.98% with only one female participating in the training. This percentage was slightly lower than the total female member representation within 161st Artillery Battalion reported at 2% of the overall unit. The difference between the sample and population female representation was due to the limited participation by the 116st Forward Support Company, which contained all of the female soldiers in the organization. The one female participant was assigned to team C creating a lower percentage male score of 83.33%

rather than 100% for the remaining teams. Due to the lack of female participants no observations were made on the impacts of gender during the experiment.

### ***Years Military Service***

Years of military experience ranges from a high of 29 years to a low of one year with an average military experience of 12.83. The median individual military experience level was 11 years and a mode of 22 years. Average military experience levels for the teams ranged from a high of 21.50 for Team C and a lowest experience level of 9.42 years for Team H. This corresponded with the highest and lowest ages among teams. As expected there was a high correlation level of .93 between age and years of military service. Similar to age distribution, Figure 4.2 shows that military service also clustered around one standard deviation from the mean in a similar manner as the sample group's age. Table 4.1 contains the average military service in years and was also considered during analysis of the data.

**Figure 4.2 Participant Military Service Histogram**



### ***FLRC Experience***

Six participants reported prior experience training at a FLRC site in Teams B, C, G, and H. This was lower than expected since it the FLRC is commonly used for training of officers and non-commissioned officers. No teams reported having negotiated the Fort Riley, Kansas FLRC and any variance among team performance was captured during the first subset for each team prior to the introduction of the LTX training while establish control data consistent with within subject testing (Gliner, et al, 2009). Table 4.2 shows the distribution of prior FLRC experience among the teams and was also considered during subsequent data testing.

### **Analysis of Performance Data**

Observers collected data on team performance by total time in seconds to complete each obstacle and the number of penalties committed by teams both prior to and after the LTX

training. Appendix H contains team performance by FLRC Obstacle and displays the data by station. Station numbers 4 and 5 both showed an improvement in the average completion time and number of penalties from pre to post-treatment. Station number 6 stayed constant with only a one second differential in average time. Station 6 contained no penalty variable so remained 0 for all teams. Further, teams A through F all achieved slower completion times while completing Stations 7, 8 and 9 from pretest to post-test after treatment with only a slight reduction in the number of penalties that occurred.

### ***Research Question 1***

Research Question 1: H1<sub>0</sub>: There is no relationship between the dependent variable, team performance, and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

Due to the small sample size and the inability to determine assumptions about the normal distribution of the data, the study employed a Wilcoxon Rank Sum nonparametric test (Fields, 2013, Kraska-Miller, 2014, Turner, 2014). The test was conducted at the 95% confidence level using IBM SPSS twice. One test to assess performance in time to complete obstacles measured as in seconds to complete obstacles and a second test to compare the number of penalties committed by teams while negotiating obstacles both before and after introduction of the LTX. The significance level ( $p$ ), test value ( $T$ ),  $z$ -score ( $z$ ) and effect size ( $r$ ) are provided in Table 4.3. Based on the Wilcoxon Rank Sum Test for performance as both time and the number of penalties committed, no observable impact on performance can be attributed to the LTX.

**Table 4.3 Wilcoxon Rank Sum Results for Team Performance**

|  | $p$   | $T$ | $z$ -score | $r$    |
|--|-------|-----|------------|--------|
| Changes in Performance in Time (sec)       | 0.249 | 5   | -1.153     | -0.333 |
| Change in Performance by Rate of Penalties | 0.273 | 2   | -1.095     | -0.316 |

To specifically address potential variations in team demographics on performance, a Friedman's Randomized Block Design nonparametric test was conducted. Team characteristics on age, military experience, or prior FLRC experience was tested to determine if team characteristics influenced performance results. The test was conducted with a hypothesis that a difference existed among team variables and differences in performance results. The Friedman's Randomized Block Design concluded that team characteristics age, military experience and prior FLRC experience does impact performance ( $p < .002$ ). To further isolate which variables were having an impact, a follow-on Wilcoxon Rank Sum test was conducted to compare each variable separately with team performance (Fields, 2013). The results are significant for age ( $p = .003$ ), military experience ( $p = .001$ ) and prior FLRC experience ( $p = .003$ ). Further testing will be needed to fully understand the relationship among age, military and FLRC experience with both performance and the LTX.

After viewing the performance data through two different nonparametric tests, the null hypothesis for Research Question 1 was retained. Further research is required to fully explore the relationship of team variables, performance and the LTX. However, based on the results from the experiment, insufficient evidence exists to conclude a relationship exists between the dependent variable team performance and the LTX while completing challenges on the Fort Riley FLRC. Chapter 5 provides further interpretation of the results and implications for future research.

### **Analysis of Survey Results**

The participants completed the survey three times by filling out pre-printed cards during the experiment consistent with a within-subject design (Gliner, et al, 2009). The first was a pre-test survey administered prior to conducting the initial set of stations. Participants completed a



second mid-test survey after teams negotiated the first set of obstacles and prior to the treatment to establish control group data as a baseline for further assessment. A final post-test survey was completed after participants had received the LTX training and conducted the final set of obstacles.

All the survey data was coded into both Microsoft Excel and IBM SPSS and then verified to ensure accuracy during transcription from the physical survey cards. An initial assessment of the data mean and mode was calculated by question and arranged side by side across all three surveys based on the individual responses sample size of  $n=65$ . The mean and the mode were selected to account for both categorical and numerical attributes of Likert scale data (Fields, 2013). Both demonstrated an observable rise across all three surveys consistent with previous field observations by Prevou et al (2009, 2011) and Brown (2006, 2009), and are displayed in Appendix I.

The survey data was divided into two parts by question with the associated dependent variable each was designed to test. Questions 1-7 were used to assess shared understanding and questions 8-15 were used to assess shared confidence. The commander's removal of individual coding data on all surveys prior to the start of the experiment limited assessing participant data below the team level from one survey to the next. Therefore, team average responses were calculated and used to compare changes in scores from one survey to the next reducing the sample size from  $n=65$  to  $n=11$ . Using team average scores each question was compared three times. Pre-test scores (survey 1) to mid-test scores (survey 2) for baseline or control group data. Then mid-test scores (survey 2) to post-test scores to assess the impact of the LTX (survey 3) and then finally pre-test scores (survey 1) and the post-test scores (survey 3) for changes from

the start to the end of the experiment. The data was tested and used to answer Research Questions 2 and 3 accordingly with results in the following two sections.

### ***Research Question 2***

Research Question 2: H2<sub>0</sub>: There is no relationship between the dependent variable of shared understanding and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

The study used survey questions 1-7 to determine participant perceptions of shared understanding. Using both the mean and mode scores, changes in survey responses are displayed in tables contained in Appendix I to visualize changes in participant responses for each of the three surveys conducted. The mean made an observable change from pre-test to mid-test, and then a much smaller change after treatment and post-test. The mode showed a smaller increase from pre-test to mid test, but a larger shift between mid and post-test, which was after treatment. The difference between the mean and the mode in understanding results is likely due to the unique characteristics of Likert surveys (Field, 2013). However, both the mean and mode results demonstrated an observable rise in scores from pre-test, to mid-test and post-test observed by Prevou et al (2009, 2011) and Brown (2006, 2009) during field observations.

In order to determine if the change in scores was statistically significant, a Wilcoxon Signed Rank nonparametric test at a 95% significant level was used to determine relationship between the dependent variable shared understanding and the LTX. For effect size, expressed as  $r$ , Cohen's  $d$  was used dividing the calculated  $z$ -score by the square root of the number of total observations (22) for each test (Fields, 2013). The comparison of the first test evaluated scores from the pre-test (survey 1) to the mid-test (survey 2). The significance level ( $p$ ), test value ( $T$ ),  $z$ -score ( $z$ ) and effect size ( $r$ ) are provided in Table 4.4. The change in responses between the

pre-test and mid-test for survey questions 1, 3-7 returned a significant value below  $p = .05$  and the rejection of the null hypothesis that no change occurred. Question 2, “*Our team will discuss and review goals and objectives to complete the obstacles*” returned a value  $p = .102$  above the significant level .05 and supports a conclusion to retain the null hypothesis.

**Table 4.4 Analysis of Pre-test/ Mid-Test (Surveys 1 and 2) “Shared Understanding”**

| Survey Questions 1-7 "Shared Understanding"   | <i>p</i> | T    | z-score | <i>r</i> |
|---|----------|------|---------|----------|
| Q1. The team will have the same understanding of how to negotiate the obstacles.                                      | 0.007    | 63.5 | 2.719   | 0.580    |
| Q2. Our team will discuss and review goals and objectives to complete the obstacles.                                  | 0.102    | 43.5 | 1.637   | 0.349    |
| Q3. Our team will follow an accepted process to complete the obstacles  | 0.005    | 64.5 | 2.822   | 0.602    |
| Q4. Our team will develop and review procedures to effectively complete the obstacles.                                | 0.010    | 62.0 | 2.585   | 0.551    |
| Q5. We have an effective way to communicate with all team members.  | 0.010    | 62.0 | 2.585   | 0.551    |
| Q6. Everyone on our team has the freedom and flexibility to do their work.  | 0.015    | 43.0 | 2.439   | 0.520    |
| Q7. Our team continuously clarifies roles, responsibilities, and competencies before, during and after each obstacle. | 0.012    | 43.5 | 2.501   | 0.533    |

The comparison of the second test evaluated scores from the mid test-test (survey 2) to the post-test (survey 3). Table 4.5 displays the significance level ( $p$ ), test value ( $T$ ), z-score ( $z$ ), and effect size ( $r$ ) results. The change in responses between the mid-test and post-test after application of the LTX yielded significant values above  $p = .05$  for all questions but question survey question 7, “*Our team continuously clarifies roles, responsibilities, and competencies before, during and after each obstacle,*” which returned  $p = .011$  below test value of .05. Consequently, the null hypothesis that the LTX would not change team perceptions of shared

understanding while completing challenges at the Fort Riley FLRC is retained except for question 7, which displayed a significant difference in scores.

**Table 4.5 Analysis of Mid-Test/Post-test (Surveys 2 and 3) “Shared Understanding”**

| Survey Questions 1-7 "Shared Understanding"   | <i>p</i> | T    | <i>z</i> -score | <i>r</i> |
|---|----------|------|-----------------|----------|
| Q1. The team will have the same understanding of how to negotiate the obstacles.                                      | 0.91     | 11.0 | 1.692           | 0.361    |
| Q2. Our team will discuss and review goals and objectives to complete the obstacles.                                  | 0.277    | 38.0 | 1.087           | 0.232    |
| Q3. Our team will follow an accepted process to complete the obstacles  | 0.401    | 29.5 | 0.840           | 0.179    |
| Q4. Our team will develop and review procedures to effectively complete the obstacles.                                | 0.172    | 34.0 | 1.365           | 0.291    |
| Q5. We have an effective way to communicate with all team members.  | 0.916    | 10.0 | -0.105          | -0.224   |
| Q6. Everyone on our team has the freedom and flexibility to do their work.  | 0.644    | 32.0 | 0.462           | 0.098    |
| Q7. Our team continuously clarifies roles, responsibilities, and competencies before, during and after each obstacle. | 0.011    | 44.0 | 2.549           | 0.543    |

The final test compared the results from tests conducted between the pre-test (survey 1) and the post-test (survey 3) for the entirety of the experiment from the beginning to the end of the day. The results support the rise in average response scores with all reporting significant *p* levels below .05 and an effect size as medium  $r > .5$  to explain total variance (Fields, 2013). The results support a conclusion that a change in shared understanding occurred as a result of the experiment for all survey questions, but only survey question 7 is directly attributed to the LTX as an independent variable.

**Table 4.6 Analysis of Pre-test/ Post-test (Surveys 1 and 3) “Shared Understanding”**

| Survey Questions 1-7 "Shared Understanding"   | <i>p</i> | T    | z-score | <i>r</i> |
|---|----------|------|---------|----------|
| Q1. The team will have the same understanding of how to negotiate the obstacles.                                      | 0.005    | 55.0 | 2.807   | 0.598    |
| Q2. Our team will discuss and review goals and objectives to complete the obstacles.                                  | 0.013    | 61.0 | 2.494   | 0.532    |
| Q3. Our team will follow an accepted process to complete the obstacles  | 0.003    | 66.0 | 2.937   | 0.626    |
| Q4. Our team will develop and review procedures to effectively complete the obstacles.                                | 0.003    | 66.0 | 2.943   | 0.627    |
| Q5. We have an effective way to communicate with all team members.  | 0.005    | 55.0 | 2.812   | 0.600    |
| Q6. Everyone on our team has the freedom and flexibility to do their work.  | 0.003    | 66.0 | 2.940   | 0.627    |
| Q7. Our team continuously clarifies roles, responsibilities, and competencies before, during and after each obstacle. | 0.003    | 66.0 | 2.937   | 0.626    |

Based on the data and the lack of significance among the scores between the mid-test (survey 2) and the post-test (survey 3), which focused on change in the dependent variable shared understanding due to the LTX treatment, the null hypothesis is retained. However, the significant rise in scores prior to treatment (survey 1 to survey 2) and scores between the start and conclusion of the experiment (survey 1 and survey 3) indicate a significant change in shared understanding occurred. For the purposes of the research the null hypothesis is retained, but further research is required to understand the variable or variables, which contributed to the change in participant perspectives about shared understanding among the team. Chapter 5 further discusses the results and recommendation about future research.

### ***Research Question 3***

Research Question 3: H30: There is no relationship between the dependent variable of shared confidence and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

The study used survey questions 8-15 to determine participant perceptions of shared confidence. Observing both the mean and mode scores, changes in survey scores are displayed in Appendix I to assist in visualizing changes in participant responses by mean and mode for each of the three surveys conducted. The mean made an observable change from pre-test to mid-test, and then a much smaller change after treatment to post-test. The mode showed a smaller but similar increase from pre-test to mid-test, but a larger shift between mid-test and post-test after treatment. The difference between the mean and the mode results was likely due to the unique characteristics of Likert surveys (Fields, 2013). However, both the mean and mode demonstrate an observable rise in scores as those observed by Prevou (2009) and Brown (2006) during field observations.

In order to determine if the change was statistically significant, the study conducted the same Wilcoxon Signed Rank nonparametric test using SPSS that was done to analyze results for Research Question 2. Additionally, the same 95% significant level for (p) and calculation of Cohen's d was made to determine effect size (r) used to assess relationship between the dependent and independent variables for Research Question 2. The same table is included as the previous section to display and discuss the results for all three series of tests.

The comparison of the first test evaluated scores from the pre-test (survey 1) to the mid-test (survey 2). The significance level (p), test value (T), z-score (z), and effect size (r) are provided in Table 4.7. The change in responses between the pre-test and mid-test for all survey questions returned a significant value below  $p = .05$ . Based on the results a significant change occurred while teams negotiated the first set of obstacles prior to introducing the independent variable as a treatment. Effect size for all questions is  $r > .5$  or "medium" except for question 1 with  $r = .477$  value returned.

**Table 4.7 Analysis of Pre-test/ Mid-Test (Surveys 1 and 2) “Shared Confidence”**

| Survey Questions 8-15 "Shared Confidence"  | <i>p</i> | T    | <i>z</i> -score | <i>r</i> |
|--|----------|------|-----------------|----------|
| Q8. Members of our team are encouraged to lead and to follow as appropriate.                         | 0.025    | 58.0 | 2.239           | 0.477    |
| Q9. If a team member does not know how to complete the obstacles, he/she is willing to ask for help. | 0.005    | 55.0 | 2.812           | 0.600    |
| Q10. Our team has clear courses of action or sequence of steps to complete the obstacles             | 0.006    | 64.0 | 2.763           | 0.589    |
| Q11. All team members are aware of key team requirements and team member's needs.                    | 0.005    | 55.0 | 2.805           | 0.598    |
| Q12. Timelines for our team are collaboratively established.   | 0.005    | 64.5 | 2.805           | 0.598    |
| Q13. Knowledge is shared effectively within the team.  | 0.008    | 45.0 | 2.673           | 0.570    |
| Q14. Lessons Learned are captured and effectively reused to improve the team.                        | 0.009    | 62.5 | 2.631           | 0.561    |
| Q15. The team has an effective way for identifying and sharing ways to complete the obstacles.       | 0.004    | 65.0 | 2.865           | 0.611    |

The comparison of the second test evaluated scores from the mid-test (survey 2) to the post-test (survey 3). Table 4.8 displays the significance level (*p*), test value (*T*), *z*-score (*z*), and effect size (*r*) results. The change in responses between the mid-test and post-test after application of the LTX yielded no significant values below  $p = .05$ . Therefore the null hypothesis that no change occurred is retained for all survey questions. Effect size is “small” at  $r < .5$  for all questions. Further discussion on the results is done in Chapter 5.

**Table 4.8 Analysis of Mid-test/ Post-test (Surveys 2 and 3) “Shared Confidence”**

| Survey Questions 8-15 "Shared Confidence"  | <i>p</i> | T    | z-score | <i>r</i> |
|--|----------|------|---------|----------|
| Q8. Members of our team are encouraged to lead and to follow as appropriate.                         | 0.588    | 39.0 | 0.542   | 0.116    |
| Q9. If a team member does not know how to complete the obstacles, he/she is willing to ask for help. | 0.67     | 16.5 | 0.426   | 0.091    |
| Q10. Our team has clear courses of action or sequence of steps to complete the obstacles             | 0.081    | 44.5 | 1.744   | 0.372    |
| Q11. All team members are aware of key team requirements and team member’s needs.                    | 0.067    | 53.5 | 1.829   | 0.390    |
| Q12. Timelines for our team are collaboratively established.   | 0.082    | 44.5 | 1.738   | 0.371    |
| Q13. Knowledge is shared effectively within the team.  | 0.084    | 37.0 | 1.727   | 0.368    |
| Q14. Lessons Learned are captured and effectively reused to improve the team.                        | 0.084    | 37.0 | 1.730   | 0.369    |
| Q15. The team has an effective way for identifying and sharing ways to complete the obstacles.       | 0.2      | 21.5 | 1.282   | 0.273    |

The final test compared the results from scores between the pre-test (survey 1) and the post-test (survey 3) for the entirety of the experiment from the beginning to the end of the day. The results are displayed in Table 4.9. The table highlights the rise in average response scores and a significant increase in shared confidence with a  $p < .05$  and effect size as medium  $r > .5$  to explain total variance. The results support a conclusion that like shared understanding a change in shared confidence occurred as a result of the experiment. However, based on the lack of significant results between mid-test (survey 2) and post-test (survey 3) the change cannot be attributed to the LTX as an independent variable.



**Table 4.9 Analysis of Pre-test/ Post-test (Surveys 1 and 3) “Shared Confidence”**

| Survey Questions 8-15 "Shared Confidence"  | <i>p</i> | T    | <i>z</i> -score | <i>r</i> |
|--|----------|------|-----------------|----------|
| Q8. Members of our team are encouraged to lead and to follow as appropriate.                         | 0.012    | 52.0 | 2.507           | 0.534    |
| Q9. If a team member does not know how to complete the obstacles, he/she is willing to ask for help. | 0.003    | 66.0 | 2.941           | 0.627    |
| Q10. Our team has clear courses of action or sequence of steps to complete the obstacles             | 0.003    | 66.0 | 2.941           | 0.627    |
| Q11. All team members are aware of key team requirements and team member's needs.                    | 0.003    | 66.0 | 2.943           | 0.627    |
| Q12. Timelines for our team are collaboratively established.   | 0.003    | 66.0 | 2.938           | 0.626    |
| Q13. Knowledge is shared effectively within the team.  | 0.003    | 66.0 | 2.944           | 0.628    |
| Q14. Lessons Learned are captured and effectively reused to improve the team.                        | 0.003    | 66.0 | 2.940           | 0.627    |
| Q15. The team has an effective way for identifying and sharing ways to complete the obstacles.       | 0.003    | 66.0 | 2.950           | 0.629    |

Based on the data and the lack of significance among the scores between the mid-tests (survey 2) and the post-test (survey 3) the null hypothesis is retained with no change observed in the dependent variable shared confidence based on the LTX as a treatment. Therefore, the experiment did not find a relationship between the dependent variable of shared confidence and the LTX in completing challenges on the Fort Riley FLRC. On the other hand, the significant rise in scores prior to treatment (survey 1 to survey 2) and scores between the start and conclusion of the experiment (survey 1 and survey 3) indicate a significant change in shared confidence occurred in a similar pattern as with shared understanding. Chapter 5 further discusses the results and recommendation for future research.

## **Correlation among Variables**

### ***Research Question 4***

Research Question 4: H4<sub>0</sub>: There is no correlation between dependent variables team performance, shared understanding, and shared confidence in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

In order to determine if any correlation exists among the team performance and the dependent variables shared understanding and shared confidence the study conducted a Spearman's Rank-Order Correlation test. The data was organized into averages based on team performance in time as total seconds to complete all stations regardless of exposure to the LTX. Averages for shared understanding and shared confidence were obtained from the pre-test and post-test surveys to identify correlations between variables and performance. An additional correlation was conducted to compare performance in average time with the rate of change in shared understanding and confidence calculated by subtracting the average survey score for the pre-test from the average score of the mid-test. A final test was conducted comparing the correlation in performance with the rate of change between the post-test scores and the pre-test scores.

An initial Spearman's Rank-Order Correlation test examined the relationship of team performance and shared understanding. At a 95% confidence level, the results from the initial Spearman's Rank-Order Correlation test returned a significant relationship between team performance scores and initial levels of shared understanding ( $r_s = -.609$ ,  $p = .047$ ). The correlation remained similar when tested against mid-test survey scores ( $r_s = -.100$ ,  $p = .047$ ). A final Spearman's Rank-Order Correlation test comparing team performance against the change in

survey results between pre-test and mid-test yielded a non-significant result ( $r_s = .118$ ,  $p = .729$ ) at a 95% confidence level.

A second Spearman's Rank-Order Correlation test was conducted to assess relationships between variables of team performance and shared confidence. At a 95% confidence level, the results returned a lack of a significant relationship among the two variables at performance and pre-test survey ( $r_s = -.373$ ,  $p = .259$ ), and mid-test survey ( $r_s = -.064$ ,  $p = .853$ ). Finally, when comparing changes in the pre-test and mid-test survey results with team performance, the results also displayed no relationship with team performance ( $r_s = -.109$ ,  $p = .750$ ).

By comparison, the dependent variables shared understanding, and shared confidence, were significantly related to one another for all tests at the 99% confidence level. All correlation coefficients were also strongly positive. For the pre-test survey  $r_s = .891$  and  $p$  values were greater than .0001. The correlations remained strong for the mid-test ( $r_s = .900$ ,  $p < .0001$ ) and when comparing changes between survey results from pre-test to mid-test for both dependent variables ( $r_s = .809$ ,  $p = .003$ ).

For Research Question 4 the null hypothesis that no correlation exists between dependent variables team performance, shared understanding and shared confidence was rejected. An unequal relationship exists between some, but not all variables. There is a strong correlation at the 99% confidence level between shared understanding and shared confidence. However, team performance showed a significant relationship with shared understanding, but performance displayed no relationship with shared confidence. So, although the null hypothesis is rejected further testing is needed to test the relationship between team performance and the shared confidence.

### ***Research Question 5***

Research Question 5: H5<sub>0</sub>: There is no correlation between dependent variables team performance, shared understanding, and shared confidence with the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

In order to answer Research Question 5, analysis from the first four research questions was supplemented by an additional two Spearman's Rank-Order Correlation test to isolate the independent variable LTX in relationship to dependent variables shared understanding and confidence. The first test was to determine if the same strong correlation continued between shared understanding and shared confidence after the introduction of the LTX. A Spearman's Rank-Order Correlation test was conducted between overall team performance and the post-test scores which confirmed the lack of relationship continued for shared understanding ( $r_s = -.445$ ,  $p = .170$ ) and shared confidence ( $r_s = -.492$ ,  $p = .124$ ). A second test found the strong correlation at a 99% significant level continued between shared understanding and confidence for post-test survey scores ( $r_s = .870$ ,  $p < .0001$ ). An additional test comparing changes between mid-test and post-test scores for the two variables also yielded the same results ( $r_s = .936$ ,  $p < .0001$ ).

Based on previous data analyzed and the additional tests conducted, a relationship between the independent variable and the dependent variables was not discovered. Although the strong relationship continues between the dependent variables shared understanding and confidence it cannot be attributed to a relationship with the independent variable LTX. Therefore, the null hypothesis was retained with no relationship identified between the dependent variables team performance, shared understanding and shared confidence and the LTX in completing challenges on the Fort Riley, Kansas FLRC.

## **After Action Review Observations**

After completing the final FLRC obstacles and the last post-test survey, the unit commander led an after action review (AAR). The commander followed the AAR process outlined in the U.S. Army's Leader's Guide to After-Action Reviews (2011), which includes capturing observations through four questions:

1. Review what was supposed to occur?
2. Establish what happened?
3. Determine what was right or wrong with what happened?
4. Determine how the task should be done differently next time?

The AAR was conducted in two large group sessions and led by the Commander and LTX trainer. Participants were encouraged to offer insights about the FLRC training and the LTX to include if the unit should do similar training in the future. The responses were random among the participants reflecting their impressions of the training. Although not part of the research design, the AAR did allow for additional observations that proved helpful in providing context to further understand the research findings. The subsequent 16 quotes were captured among the two groups of participants and included in no particular order:

- "We did the steps, but not in order."
- "We did all the steps at once."
- "You knew everybody knew what was going on."
- "Helped collaborating on an idea and already had the same idea and thinking the same thing."
- "Not communicating with me, maybe because I'm a private, wasn't a good experience for me."
- "Everybody had their say and went with the best idea."
- "Put more emphasis with junior leaders, brings out competencies they didn't know they had."

- “Switch team members between batteries so they don’t have the conflict of knowing the leaders.”
- “Best damn thing for a squad or platoon to do!”
- “Commander, a big sustainment!”
- “Slow at first, juggling with it.”
- “Made us more efficient, more effective, made a big difference.”
- “Worked well on the first run, but much tighter on the second run.”
- “We are all leaders and we had to decide who the leader is.”
- “Everybody huddled up, what’s going on, how we going to do it.”

Two addition questions were included along with the standard three AAR questions.

The participants asked to respond either “yes” or “no” to the questions below. Participants responded with a “yes” 63% and 60% respectively. However, no further analysis was conducted since it was not part of the experiment’s design, but does provide additional insights on general perceptions of participants about the LTX.

1. Did you feel more confident about your teams’ ability to successfully complete the FLRC tasks after the training?
2. Did the LTX help you organize how you would approach the FLRC problems?

## **Summary**

This chapter described the analysis and results from the research experiment conducted on June 18, 2013 at the FLRC at Fort Riley, Kansas. The chapter provides a descriptive overview of the sample demographics about the participants and teams within the experiment. The chapter also included non-parametric testing of the FLRC performance to test the relationship between the dependent variable team performance and the LTX to answer Research Question 1. In addition, the chapter also conducted nonparametric testing survey of data to analyze the relationship between the dependents variable of shared understanding and shared

confidence and the LTX to answer Research Question 2 and 3. Finally, the last section compared the results among the dependent variables to one another and the independent variables to identify correlations present to answer Research Question 4 and 5. A final section is included on captured qualitative data used to further understand the data in a discussion and recommendation as part of the next chapter.

## **Chapter 5 - Discussion**

### **Introduction**

The final chapter consists of a discussion and conclusion on the findings and offers recommendations for further research based on the statistical analysis conducted in Chapter 4. The research tested the Leader Team Exercise (LTX) as an independent variable against three reported benefits observed in the field through five research questions. The study first examined if the LTX influenced team performance. This was tested through the assessment of time and the number of penalties teams incurred while negotiating obstacles on a Field Leaders Reaction Course (FLRC) at Fort Riley, Kansas. The second two variables consisted of a team's sense of shared understanding and confidence while negotiating obstacles assessed through the use of pre-test, mid-test and post-test surveys of the participants. The first section examines all five by research question and discusses each. Also, a subsequent section covers the implications and offers suggestions for future research. Because organizations use the both the LTX and the Field Leaders Reaction Course (FLRC), suggestions for future research includes recommendations for further experimentation and practical application to include consideration for use by the Kansas Army National Guard or similar units in the U.S. Army.

### **Discussion of Findings and Conclusions**

#### ***Research Question 1***

Research Question 1: H1<sub>0</sub>: There is no relationship between the dependent variable, team performance, and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

The experiment attempted to examine if there was a relationship between team performance and application of the LTX while completing obstacles at the Fort Riley, Kansas



FLRC. The Wilcoxon Rank Sum test returned inconclusive results and retaining of the null hypothesis when comparing performance measured in both time and number of penalties before and after the introduction of the LTX. Therefore, the experiment did not uncover the benefits of the LTX observed at USEUCOM Headquarters by Prevou et al (2009, 2011), but did observe a somewhat similar pattern of improvement in half the stations post-treatment which mirrors data collected in the field. Conversely, the Friedman's Randomized Block Design test and follow-on Wilcoxon Rank Sum tests comparing performance to team characteristics did conclude that age, military and prior FLRC experience does impact performance.

The sample teams displayed higher levels of homogeneity than teams observed in the field, an advantage in order to control variables and test the LTX. The caution is the results in a controlled environment with homogenous teams still returned varying levels of performance based on age, military and FLRC experience. The experiment employed the FLRC in an attempt to control prior military experience by measuring teams as they negotiated simple obstacles where skills learned over time would not provide one team an advantage over another team. Clearly the results show that age and experience contribute to performance even at basic levels and suggest a correlation might exist as complexity is introduced into a team's task. Brown (2006, 2009, see also Bradford & Brown, 2008) and Prevou et al (2009, 2011) specifically noted the LTX helps increase performance among inter-agency teams. The research findings suggest team diversity impacts results beyond organizational difference to individual characteristics of the members themselves.

In addition, task complexity and time of task were simpler and shorter than observations of performance in the field. As initial research, the experiment intended to discover if team performance had changed at a foundational level prior to the introduction of additional

environmental variables. For example, the teams observed by Prevou, et al (2009) at USEUCOM were from multiple organizations attempting to complete complicated tasks as part of a major military exercise. The presence of multiple uncontrolled variables resulted in speculation on what was causing the LTX to increase performance. Although not determined through this experiment, the results suggest other variables might have impacted performance beyond the team's ability to organize and accomplish simple tasks conducted over a short duration.

An additional factor, which limited the results, was the change in sample size just prior to the experiment. Based on safety concerns, the number of teams was reduced from 22 to 11 teams, with each team doubling in size from three to six members. The minimum number of team member's necessary to negotiate obstacles was initially assessed at three in coordination with the unit. However, the morning of the experiment range safety officers recommended an increase in team size to five members and the 161<sup>st</sup> Battalion Commander ultimately decided to adjust team composition to six members to maximize safety and the training benefit for his soldiers. No other changes were made to the experiment, but the reduction in the overall number of teams reduced the sample size from 22 to 11 and the number of different teams negotiating the obstacles.

### ***Research Question 2***

Research Question 2: H2<sub>0</sub>: There is no relationship between the dependent variable of shared understanding and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

A high level of significant change occurred in shared understanding from the pre-test to mid-test surveys as teams established baseline data for the FLRC course. A much smaller change

was observed and determined as statistically insignificant when measuring the change between the mid-tests to post-test. The conclusion is the LTX did not impact shared understanding among participants; however, the data does suggest something was occurring among the members of the teams. All participants reported higher levels of shared understanding in their survey scores, which uniformly increased from the beginning to the end of the day.

Although the possibility exists that a carryover effect occurred between the initial team experiences negotiating the first subset and post-treatment application of the LTX, a closer examination of the data suggests something else may also have been occurring. Question #2 on the survey, *“Our team will discuss and review goals and objectives to complete the obstacles”* remained insignificant both prior to and subsequent to the introduction of the LTX. The scores became statistically significant from the beginning to the end of the day comparing pre-test to the post-test. Hackman (2002, 2011) suggested five conditions needed by a team that includes an enabling structure, which facilitates task completion and a compelling direction both provided by the FLRC, but not achieved prior to and after the introduction of the LTX. However, the experience of teaming itself as suggested by Edmondson (2012) and Wilson (2007) may have contributed to the increase between pre-test and post-test survey scores and an unintended carryover effect separate from the impact of the FLRC or the LTX.

In addition, the LTX also caused a significant change in question #7 on the survey, *“Our team continuously clarifies roles, responsibilities, and competencies before, during and after each obstacle.”* Similar to the previous question, roles, responsibilities, and competencies were those identified within the team and not prescribed externally as part of the experiment or the FLRC. Despite the structure provided, the team felt the LTX added to internal team shared understanding when not provided externally.

Both questions #2 and #7 on the survey indicated that although the FLRC may have provided several of Hackman's (2002) essential elements neither sufficiently address the intra-team dynamics between participants. Edmondson (2012) and Wilson (2007) both noted the importance of shared understanding relating to language and learning in teams. Furthermore, observations in the field were conducted among diversified teams performing complex tasks over time, which imply a larger potential for gaps in shared understanding.

Moreover, the qualitative data also suggest a change was occurring within the teams if not readily apparent through the survey data. Comments from the After Action Review (AAR) such as, "*Helped collaborating on an idea and already had the same idea and thinking the same thing*" and "*We are all leaders and we had to decide who the leader is*" suggest changes in intra-team dynamics may have occurred. Also a change from 34% to 68% reporting either "strongly agreeing" or "agreeing" pre- to post-levels of shared confidence between the mid-test surveys to post-test surveys after the introduction of the LTX and a 60 % favorable response to the AAR question, "*Did the LTX help you organize how you would approach the FLRC problems?*" Both support additional inquiry to fully identify what dependent variables are changing within the teams.

As stated earlier, the initial research of the LTX removed variables of team diversity, tasks complexity, and time within the experiment to test shared understanding at a foundational level. The quantitative data proves the FLRC generates shared understanding among teams. The LTX improved a team's ability to clarify "roles, responsibilities, and competencies before, during and after each obstacle." However, the experiment provided further clarity on variables the LTX does not impact and combined with the qualitative data suggests potential variables it might influence and provided a baseline for future research.

### ***Research Question 3***

Research Question 3: H3<sub>0</sub>: There is no relationship between the dependent variable of shared confidence and the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

Unlike changes in the dependent variable shared understanding, shared confidence followed a more uniform pattern throughout the experiment. Scores for all eight questions of the survey steadily increased throughout the day. The change from the pre-test to the mid-test was significant, but the change after introduction of the LTX from mid-test to the post-test was not. Also, like changes in shared understanding, the change from pre-test to post-test was also significant. Therefore, the participants reported they perceived much higher levels of confidence as the experiment progressed regardless if the change was due to the LTX or not.

Similar to Research Question 2, comments from the After Action Review (AAR) such as, *“You knew everybody knew what was going on”* and *“Made us more efficient, more effective, made a big difference”* also implies variations in intra-team dynamics among participants. Likewise a change from 25% to 49% reporting either “strongly agreeing” or “agreeing” pre- to post-levels of shared confidence between the mid-test surveys to post-test surveys after the introduction of the LTX. Also 63% reported favorable response to the AAR question *“Did you feel more confident about your teams’ ability to successfully complete the FLRC tasks after the training?”* support additional research about what is occurring within the teams. Brookfield (2013) highlighted the influence of incorporating multiple voices and perspectives and decision-making processes to promote confidence among learners. Although Brookfield specifically addressed learners in a classroom environment, Garvin (2000) noted the importance of shared experience to aid a team’s learning in action to overcome challenges. Both Brookfield and

Garvin suggest confidence empowers learning whether in a classroom or on a FLRC at Fort Riley Kansas.

#### ***Research Question 4***

Research Question 4: H4<sub>0</sub>: There is no correlation between dependent variables team performance, shared understanding, and shared confidence in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

The lack of correlation between dependent variables performance, shared understanding and shared confidence was surprising. The initial correlation identified between performance and shared understanding ( $r_s = -.609$ ,  $p = .047$ ) is noteworthy but requires further clarification before drawing a conclusion about its implications. The correlation was negative and hard to ascertain with the available data if lower levels of shared understanding inversely impacted performance in the first subset or correlated to higher changes in performance. This is largely due to a lack of relationships within subsequent results either at the mid-point survey or post-treatment.

On the other hand, the high levels of correlation between dependent variables shared understanding and shared confidence was less surprising. The correlations were strongly positive throughout the experiment and it was not difficult to understand why higher levels of shared understanding would increase someone's confidence or inversely why confidence would increase a team's ability to generate shared understanding. Brookfield (1990, 1995 and 2013) discussed the role of a secure environment on learning and increased levels of sharing especially when confronting boundaries of comfort based on culture or individual bias.

The high correlation levels throughout the experiment raise questions about the reliability and sensitivity levels within the survey. Although the potential exists for the generation of

shared qualities in one area to positively influence another area of shared qualities, the high correlation results implies additional validity testing may be needed to capture differences between shared understanding and shared confidence should they exist.

### ***Research Question 5***

Research Question 5: H5<sub>0</sub>: There is no correlation between dependent variables team performance, shared understanding, and shared confidence with the LTX in completing challenges on the Fort Riley, Kansas, Field Leaders Reaction Course.

The intent of Research Question 5 was to determine if the independent variable LTX and the three dependent variables were related to one another. For example, the LTX improved team performance which was related to an increase in shared confidence. However, lack of significant findings between the dependent variables and the LTX made an assessment or correlation difficult. On the other hand, after the introduction of the LTX, the strong relationship continued between the dependent variables shared understanding and shared confidence. Although the data does not show any changes due to the LTX, the strong correlation does not appear negatively impacted either. The strong correlation among the two variables suggest the influence of Hackman's (2002, 2011) and Wageman, et al, (2008) enabling team conditions may have been provided by the FLRC that in turn had more influence than the LTX. The results also suggest the benefits of shared experiences noted by Garvin (2000) to promote team learning even if the results did not provide a significant correlation with performance.

### **Implication of Results**

As initial research, there was a lack of quantitative data to help understand why the LTX was observed as successful in unconstrained field environments facing complex tasks among diversified teams. The results from the experiment concluded that teams facing simple tasks

over a short duration did not benefit from the LTX; however, it did obtain comparable results observed in descriptive statistics. This suggests there are other factors either not tested or not captured based on the levels of sensitivity available through the sample, experiment or evaluation tests used in this study. Although team performance was not significantly different and changes observed among survey questions were not directly related to the LTX, teams did improve or report higher scores throughout the experiment. These results parallel those found during field observations, but clearly there are other variables that impact the teams. The data does suggest what is not occurring even if it does not identify specific variables influenced by the LTX.

All teams experienced increases in shared understanding and shared confidence throughout the experiment with the largest increases occurring between initial team formations and negotiating obstacles during the first FLRC subset prior to the introduction of the LTX. This would suggest that the FLRC might also promote shared qualities among team members in addition to any benefit derived from the LTX. The FLRC is traditionally used to develop leadership skills rather than teamwork and the research findings suggest further inquiry is needed to determine if the training might provide broader benefits to develop teams in the future. Wilson (2007) observed benefits of the positive language among team members under stress to improve performance. The FLRC might provide a structured training method to improve team communication in a learning environment prior to the introduction of stressful conditions during operations when time or pre-task training is not available.

A second implication from the study is to identify the differences between the potential of the FLRC to provide a team the support identified by Hackman (2002, 2011) and Wageman et al (2008) and those Prevou et al (2009, 2011) and Brown (2006, 2009) observed provided by the LTX in the field. The question suggests a potential gap the LTX might be providing in the field



not replicated at the FLRC. Although it's not practical to have work or action teams in the middle of execution take an afternoon to negotiate obstacles at a leader's reaction course, the use of an approach, such as the LTX, to generate shared qualities may serve as an alternative in the field. This was not tested and more work is required to fully explore potential impacts of different structured approaches to teambuilding.

In addition, the environment, specifically weather, may have influenced the experiment and the rate of fatigue among the participants. Sunrise had occurred well before the 8:00 A.M. start of the experiment providing full sunlight even in the shaded areas of the FLRC. The temperature started around 70 degrees Fahrenheit and rose throughout the day to a reported high of 91 degrees Fahrenheit by mid-afternoon. The combination of heat and sunlight made the stations directly exposed to the sun more uncomfortable than those obstacles located in the shade. Teams did not report that the sun or heat impacted their performance, but observations among the control group suggest that environment variables need further consideration in the future.

Finally, practical applications of the research can inform leaders in organizations to make a decision about the inclusion of the FLRC or the LTX as a team development tool. The research also supports the adult education body of knowledge by increasing understanding about the learning dynamics occurring outside the classroom and in teams in the workplace. The implications to improve teams that rapidly form, disband and form again will impact adult learning across the government, academia and industry. Therefore, conclusions about the research were divided into two sections consisting of research itself and practical applications for the future.

### ***Research Implications***

The research attempted to advance the body of knowledge surrounding ToL in general and the LTX specifically. Both support adult learning outside the classroom. As initial research, the design and data collected will provide a foundation to further advance our understanding of the LTX. In addition, implications of this research will inform future researchers to continue exploration into the full depth and breadth of the LTX in other settings and conditions.

One concern with a between-subjects study is the carryover effect from pre to post-treatment which was a concern in the research design. While the data on team performance staying mixed suggests that the carryover-effect was minimal and did not provide an advantage to teams negotiating obstacles at stations post-treatment. This would suggest the FLRC is an adequate tool to support further research or as a training platform to instruct the LTX by the Kansas Army National Guard. The ToL survey provided similar results to data collected in the field, but concerns about sensitivity between the pre-test survey, mid-test and post-test surveys was due to an underlying validity issue or lack of impact by the LTX. The research provides an additional data set to assess the survey.

### ***Practical Applications***

During the AAR and the conclusion of the training, the 161<sup>st</sup> Artillery battalion leaders observed that the training was popular among the participants in the unit. The observers and controllers which supported the experiment and the LTX trainer were asked multiple times for copies of the training guides and methods they could use to conduct similar training with other soldiers in the future. As a practical application, the Kansas National Guard should assess the experimental design to conclude if modification of traditional leadership training conducted at the FLRC might provide a broader application to benefit other units. In addition, the

development of modified or new training guides derived from those used to support the experiment. Finally, adult educators can assess if the research provides a sufficient foundation to further inquiry into team learning and if there is a gap between classroom approaches and available methods for use in the field.

### **Recommendations for Future Research**

Although the study did not find statistical significance from the data about the LTX, the information collected will contribute to understanding about its use. Clearly something is occurring in the field that makes the LTX an attractive means to improve team performance even if not directly replicated at the FLRC. As initial research, variables associated with complexity, time, and diversity were minimized through the selection of participants from the 161<sup>st</sup> Artillery Battalion. Therefore, following recommendations for future research are suggested based on the findings of this research project:

1. Further research is needed to understand the impact of the FLRC on team performance. Although a within-subjects design was useful for initial research, future studies should consider a between-subjects design with an independent control group to fully understand the FLRC effect on team performance. Between subjects testing of teams negotiating obstacles would provide a foundation for the introduction of additional variables such as the LTX or different variations of team design. No such data existed for this research project requiring a within-subjects approach that now provides the foundation to make assumptions about distribution of the data in the future.
2. Future research should assess the value of the FLRC as a team-building tool in addition to its current use as a leadership training exercise. Although team

performance and number of penalties didn't improve, the positive change in the survey data between pre-test to mid-test and pre-test to post-test surveys suggests that the FLRC obstacles might also act as a positive contributor towards team shared characteristics. The FLRC itself might serve as a preparation tool to prepare teams in the future, as well as, to develop leaders.

3. Prevou (2009) noted that diversity played a role in LTX application in several field settings not replicated in the sample used for this research. As initial research, variables contributing towards diversity were purposely excluded through the selection of a more homogenous sample. Future research should include varying levels of diversity based on individual or organizational backgrounds, experiences, and motivations. Hackman (2002, 2011), Prevou et al (2009, 2011), and Brown (2006, 2009) all noted the importance of enabling structures when cross boundary diversity exists among team members. Follow-on research is needed to investigate if there is a correlation between diversity, the LTX, and team performance or shared characteristics.
4. Prevou et al (2009, 2011; Prevou, personal communication, January 25, 2013 & March, 12, 2014) also observed that a potential correlation exists between task complexity and the benefits of the LTX during application. Similar to diversity, variables associated with task complexity were controlled through the selection of the FLRC as an assessment tool of performance. Does the LTX effect on performance change based on the increasing levels of team task complexity or amount of time needed to complete a task or series of tasks?

5. Further research is needed on the role of gender within teams and the impact of the LTX to improve shared understanding and confidence. This was not tested due to the 99.8% male demographics of the sample. Are there benefits or disadvantages to the LTX in enabling team learning and performance based on gender?
6. Additional validity testing of the ToL survey is needed. The high correlation levels between the survey results for shared understanding and shared confidence suggest participants develop both together. Further validity testing of the survey could generate questions more sensitive to differences or reduce the overall size of the current survey and use the same questions to capture data about both attributes.

## **Conclusion**

Finally, the after action review observations and questions suggest qualitative studies would yield further understanding into LTX effects on internal team dynamics. Despite the statistical evidence, the after action review returned positive feedback from the participants not measured as part of the study. Future qualitative research might uncover the presence of existing variables or impacts not readily discoverable through quantitative based research. Both Wilson (2007) and Edmondson (2011) highlighted the importance of the interpersonal relationship between team members on team success and the language used to build shared understanding and supportive structures to overcome problems and challenges. The LTX may provide a medium to build those relationships not measured within the study.

The application of Teams of Leaders and the use of the LTX was observed by Prevou et al (2009, 2011) and Brown (2006, 2009) to have a positive effects on team performance. This research was important to understand why increases in team performance, shared-understanding and shared-competence were observed and what environmental variables might have contributed

towards the conclusion of the LTX's prior success. Even if the research identified variables not influenced by the LTX. Due to a lack of data, determining what dependent variables the LTX did not impact was as important as finding significance on those it does. Future research at a minimum should build on these initial results and add other variables to test the LTX.

The importance of a simple structured approach to enhance team learning and improve performance could have an impact across a wide range of future applications. For example, the Kansas Army National Guard has expressed interest in how the LTX might assist in generating teamwork necessary among local, state and federal responses during a disaster. The low cost in resources needed by a team to implement the LTX and the potential advantages offered by what cross boundary teams might contribute through their expertise alone warrants fully developing an understanding the appropriate application of the LTX for future.

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## **Appendix A - Acronyms**

|           |  |
|-----------|--|
| AAR       | After Action Review                        |
| ADP       | Army Doctrine Publication                  |
| USAFRICOM | United States Africa Command               |
| AKM       | Army Knowledge Memorandum                  |
| AKO       | Army Knowledge Management                  |
| APF       | Army Professional Forum                    |
| ARI       | Army Research Institute                    |
| ATEI      | Army Training Enterprise Integration       |
| ATLDP     | Army Training and Leader Development Panel |
| BCKS      | Battle Command Knowledge Systems           |
| BN        | Battalion                                  |
| CAC       | Combined Arms Center                       |
| CALL      | Center for Army Lessons Learned            |
| CLT       | Commander Leader Team                      |
| CoP       | Communities of Practice                    |
| DARPA     | Defense Advanced Research Project Agency   |
| DMX       | Decision Making Exercises                  |
| FA        | Field Artillery                            |
| FCS       | Future Combat                              |
| FLRC      | Field Leaders Reaction Course              |
| FM        | Field Manual                               |
| GWOT      | Global War on Terrorism                    |
| HHB       | Headquarters, Headquarters Battery         |
| HP CLT    | High Performing Commander Leader Teams     |
| HP LT     | High Performing Leader Teams               |
| IAV       | Interim Armored Vehicle                    |
| IBCT      | Intermediate Brigade Combat Teams          |
| IDA       | Institute for Defense Analysis             |
| IM        | Information Management                     |

|         |   |
|---------|---|
| JIATF   | Joint Inter-Agency Task Force                                     |
| JIIM    | Joint, Inter-agency, Inter-Governmental, Multinational            |
| JP      | Joint Publication   |
| JTF     | Joint Task Force  |
| KM      | Knowledge Management  |
| LDX     | Leader Development Exercise                                       |
| LT      | Leader Team   |
| LTG     | Lieutenant General  |
| LTG (R) | Lieutenant General (Retired)                                      |
| LTX     | Leader Team Exercise  |
| MOP     | Measures of Performance   |
| NATO    | North Atlantic Treaty Organization                                |
| NCO     | Non-Commissioned Officer  |
| NGO     | Non-Governmental Organization                                     |
| ROTC    | Reserve Officer Training Corps                                    |
| S/CRS   | Stated Department/Coordination, Reconstruction, and Stabilization |
| S1      | Adjutant, Human Resources   |
| S2      | Intelligence  |
| S3      | Operations  |
| S4      | Logistics   |
| SCP     | School for Command Preparation                                    |
| SKA     | Skills, Knowledge, Attributes                                     |
| TDS     | Team Diagnostic Survey  |
| ToL     | Teams of Leaders  |
| TRADOC  | Training & Doctrine Command                                       |
| TTP     | Tactics, Techniques and Procedures                                |
| U.S.    | United States   |
| UAN     | University After Next   |
| USEUCOM | United States European Command                                    |
| WKN     | Warrior Knowledge Network   |
| XO      | Executive Officer   |

## Appendix B - 161<sup>st</sup> Battalion Approval Memorandum



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
1ST BATTALION, 161ST FIELD ARTILLERY  
3535 WEST DOUGLAS AVENUE  
WICHITA, KANSAS 67213-2405

NGKS-FAB-Z

30 May 2013

### MEMORANDUM FOR RECORD

SUBJECT: Experiment Support at Field Leaders Reaction Course (FLRC), Fort Riley, Kansas

1. The 161<sup>st</sup> Artillery Battalion, Kansas National Guard grants approval for Kansas State University to conduct a dissertation experiment by Bradley Hilton on or around 18 JUN 13 at FLRC, Fort Riley, Kansas.
2. The 161<sup>st</sup> Artillery Battalion will conduct training at the FLRC on 18 JUN 13 as part of the Unit's Leader Development Training. The Leader Team Exercise (LTX) will benefit the individual leader development and the overall collective training for the Unit.
3. The Battalion will coordinate with the Fort Riley Range Control and the Experiment Support Staff to meet all administrative, safety and operational requirements in order to conduct training at the FLRC site.
4. The Unit will support the Kansas State University Institutional Review Board (IRB) processes and protocols to protect volunteers from the unit who participate in the research.
5. The point of contact for this memorandum is Major Adam Krein at (785) 817-2954 or email at [adam.d.krein.mil@mail.mil](mailto:adam.d.krein.mil@mail.mil).



MARTIN FRIES  
LTC, FA, KSARNG  
Commanding


## Appendix C - IRB

**KANSAS STATE**  
UNIVERSITY

University Research and Compliance Office

TO: Sarah Jane Fishback  
Educational Leadership  
354 Bluemont Hall

Proposal Number: 6734

FROM: Rick Scheidt, Chair   
Committee on Research Involving Human Subjects

DATE: 06/14/2013

RE: Approval of Proposal Entitled, "Impact of the Leader Team Exercise on Team Performance."

The Committee on Research Involving Human Subjects has reviewed your proposal and has granted full approval. This proposal is approved for one year from the date of this correspondence, pending "continuing review."

APPROVAL DATE: 06/14/2013

EXPIRATION DATE: 06/14/2014

Several months prior to the expiration date listed, the IRB will solicit information from you for federally mandated "continuing review" of the research. Based on the review, the IRB may approve the activity for another year. **If continuing IRB approval is not granted, or the IRB fails to perform the continuing review before the expiration date noted above, the project will expire and the activity involving human subjects must be terminated on that date. Consequently, it is critical that you are responsive to the IRB request for information for continuing review if you want your project to continue.**

In giving its approval, the Committee has determined that:

☒  
☐

There is no more than minimal risk to the subjects.

There is greater than minimal risk to the subjects.

This approval applies only to the proposal currently on file as written. Any change or modification affecting human subjects must be approved by the IRB prior to implementation. All approved proposals are subject to continuing review at least annually, which may include the examination of records connected with the project. Announced post-approval monitoring may be performed during the course of this approval period by URCO staff. Injuries, unanticipated problems or adverse events involving risk to subjects or to others must be reported immediately to the Chair of the IRB and / or the URCO.



203 Fairchild Hall, Lower Mezzanine, Manhattan, KS 66506-1103 | (785) 532-3224 | fax: (785) 532-3278 | [k-state.edu/research/comply](http://k-state.edu/research/comply)



## **Appendix D - LTX Experiment FLRC Guidebook**

# THE EXPIREMENT GUIDEBOOK

## IMPACTS OF THE LEADER TEAM EXERCISE ON TEAM PERFORMANCE

An experiment conducted in cooperation between Kansas State University and members of the  
161<sup>st</sup> Artillery Battalion, Kansas National Guard

Field Leaders Reaction Course  
Fort Riley, Kansas

June 18, 2013



This experiment is to help establish quantitative data about the Leader Team Exercise in an experimental design that isolates and measures the Leader Team Exercise. The results will further grow the body of knowledge and understanding of the Leader Team Exercise as a team building tool and to provide additional information for the Kansas National Guard to determine if the Leader Team Exercise is suitable for inclusion in Joint and Inter-Agency training in support of the State of Kansas.

## Table of Contents

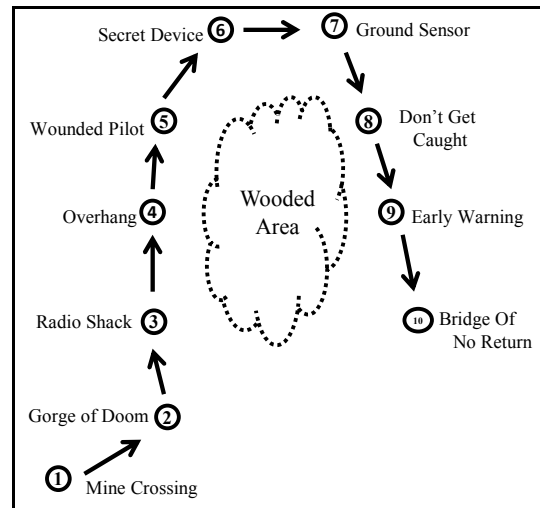
|  |     |
|--|-----|
| Chapter 1 - Introduction.....  | 131 |
| Overview.....  | 131 |
| Safety .....   | 133 |
| Data Collection .....  | 133 |
| Practice Obstacle- FLRC Station #1 “The Minefield” .....                   | 134 |
| Chapter 2 - Sub Set #1 .....   | 137 |
| Overview.....  | 137 |
| Safety .....   | 137 |
| Data Collection .....  | 137 |
| Sub Set #1 Obstacle - FLRC Station #4 “Overhang” .....                     | 138 |
| Sub Set #1 Obstacle - FLRC Station #5 “The Wounded Pilot” .....            | 141 |
| Sub Set #1 Obstacle - FLRC Station #6 “The Secret Device” .....            | 145 |
| Sub Set #1 Back-Up Obstacle - FLRC Station #2 “Gorge of Doom” .....        | 148 |
| Chapter 3 - Sub Set #2 .....   | 151 |
| Overview.....  | 151 |
| Safety .....   | 151 |
| Data Collection .....  | 151 |
| Sub Set #2 Obstacle - FLRC Station #7 “Ground Sensors” .....               | 152 |
| Sub Set #2 Obstacle - FLRC Station #8 “Don’t Get Caught” .....             | 155 |
| Sub Set #2 Obstacle - FLRC Station #9 “Early Warning” .....                | 158 |
| Sub Set #2 Back-Up Obstacle - FLRC Station #10 “Bridge of No Return” ..... | 161 |
| Acronyms.....  | 164 |

# Chapter 1 - Introduction

## Overview

The Leaders Reaction Course was developed during the first half of the 20<sup>th</sup> Century initially as a pre-World War II officer evaluation tool by the German Army and then later adapted and further developed by the British and United States Militaries in the 1950s and 1960s. The course, in addition to developing leadership skills is also designed to build teamwork and critical thinking and problem solving.

- (1) To improve leadership ability by affording leaders an opportunity to apply the lessons learned in a formal training environment.
- (2) To build positive traits and behaviors in leaders.
- (3) To provide the means of making a self-evaluation to determine more accurately an individual's leadership strengths and weaknesses.
- (4) To provide the opportunity to observe the effects of strengths and weaknesses of others in a team setting.



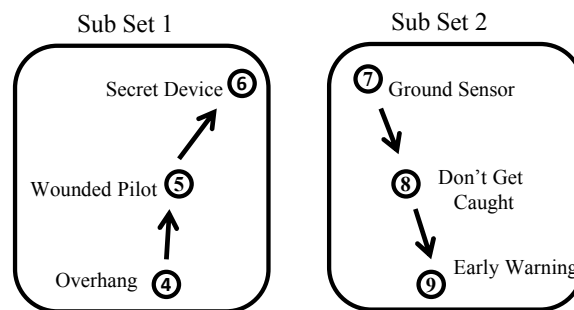
Field Leaders Reaction Course Layout

Participants will be asked to complete challenges on the Fort Riley Leadership Reaction Course (FLRC) and then a second time employing the Leader Team Exercise. In addition to the FLRC, participants are asked to complete a survey pretest, intermediate test and posttest to measure team member's sense of shared confidence and shared understanding of the team's ability to negotiate the FLRC.

The FLRC at Fort Riley, Kansas is consistent with the common design of Leaders Reaction Courses throughout the U.S. Army. The Fort Riley Course consists of ten stations organized in a semi-circular pattern as depicted in the Figure with each station designed to test leaders as they negotiate a challenge or obstacle. For this experiment nine of the ten stations will be used. Station number 3, the Radio Shack, will not be used since it does not meet the necessary criteria for the training.

The first station, called the “Mine Crossing” is for designated as a practice or rehearsal station. In addition, six stations were selected and divided into two groups identified as **Sub Set #1** and **Sub Set #2**. These stations sets will provide the framework for the teams to negotiate the obstacles both with and without using the LTX. The Figure below shows the layout of the FLRC stations with the alignment of the six stations into the two Sub Sets to support the training.

**Sub Set #1** includes **stations 4, 5, and 6** located on the western side of the FLRC training area depicted by the first box and **Sub Set #2** includes **stations 7, 8, and 9** located on the eastern half of the course and shown by the box on the right.



Sub Sets #1 & Sub Set #2

The experiment will start at approximately 6:00 A.M. at the FLRC site with the controllers, observers and support staff arriving to set up the site. Immediately following a review of the timeline, a review of evaluation guidelines will be conducted for each stage of events using the FLRC Station #1 “Mine Crossing.” This will include a rehearsal of grading procedures for the controllers for each of the stations along with LTX.

At approximately 8:00 AM participants will arrive at the FLRC site and receive a range control and safety brief in accordance with Fort Riley policy. The participants will then be organized into teams designated by the battalion commander and randomly divided into one of two test groups labeled as Test Group A and Test Group B. Once assigned, participants will complete a FLRC Participant Form and the initial Pre-Test survey.

Starting at 8:30 AM the teams will move to their initial FLRC Sub Set and spend an hour negotiating the first set of obstacles completing all three prior to returning to the FLRC Marshalling Area for training on the LTX. The initial stations are based on test groups with Group A completing Sub Set #1 and Test Group B completing Sub Set #2. Upon completion of the initial Sub Sets, all teams will return to the FLRC Marshalling Area, complete an intermediate survey and receive approximately 1 to 1 ½ hours’ worth of instruction on the LTX. After training, the Test Groups will switch FLRC Sub Sets and complete the remainder of the stations using the LTX.

At the conclusion of the second rotation through the stations, the teams will re-assemble at the FLRC Marshalling Area and be asked to complete a post-survey. The battalion commander will also conduct an After Action Review to capture lessons learned. The training for each group of teams is expected to take approximately 4 hours. The Battalion commander

may decide to add additional teams which could extended the overall training period, but will not last longer than one day.

## **Safety**

Safety is of the utmost importance. Per Army protocol everyone on the course is also a safety officer and should stop training if an unsafe act is observed or about to occur. The FLRC OIC/NCOIC will conduct a range control briefing that will include general safety instructions, type and location of medical personnel, and equipment on site at the FLRC. Reporting procedures will also be discussed at that time for safety or medical incidents that occur during training.

Controllers are located at each station to ensure safety procedures are followed and may designate safety officers as needed to protect participants negotiating the obstacles. Additionally, each station has safety instructions included in this booklet that controllers will read as part of the instructions prior to the team negotiating the obstacle. Should a safety incident occur, training will temporarily halt, the safety concern addressed and then training will continue.

## **Data Collection**

Participants will choose a 4-6 character alpha numeric code for use throughout the training. An additional code will be selected by each team and used in the same manner as individual codes. Controllers and Observers will collect all data using these codes and not use any individuals name or other descriptors that may be used to connect data with an individual, which is by design to support the experiment. All other notes or references to either individuals or teams collected will use these codes to include writing down times on the data sheets in this book and the surveys. See the Battalion Commander or LTX researcher (Brad Hilton) if there are questions about the collection of data.

## Practice Obstacle- FLRC Station #1 “The Minefield”

1. **Introduce Obstacle:** “Welcome to Station Number One, the Minefield Obstacle!



2. **Mission:** Your mission is to deliver a box of ammo to resupply your company. However, on the way to the company area, you encountered a minefield. Time is critical, as your company is low on ammunition and the enemy is attacking. Therefore, the team must cross the minefield. Resupply is urgent so the team does not have time to probe and clear the minefield. The team must use the boards found nearby and the tree stumps in the minefield in order to cross. The enemy set booby traps before they withdrew; avoid contact with the ground, fences, and wood beams. You may use material near the obstacle.
3. **Equipment:**
  - 1 x Board (2inX8inX3ft)
  - 2 x Boards (2inX8inX8ft)
  - 1 x Empty Ammo Can
4. **Safety Factors:** Do not jump from stump to stump. You may “stride” from stump to stump provided you maintain one foot on a stump at all times.
5. **Team Leader has 1 minute for a leaders RECON.**

## **Notes for the FLRC Station Controller**

### **1. Controller Instructions**

- a. A penalty occurs when an individual or item of equipment either steps or falls into the area between the tree stumps considered to be mined or an individual touches the ground, fence or wood beam.
- b. If a penalty occurs, the individual or equipment will return to the start, receive a 15 second penalty, and be placed back into play by the controller. The remainder of the team may continue working minus the penalized member(s) and equipment.

### **2. Task Solution**

- a. Team members may employ a number of various combinations for using the boards to cross the minefield. They may use a “relay system” of boards and individuals to cross within the time limits.
- b. All team members, the ammo box and equipment used in the solution must cross the barrier to the other side.



**Data Collection – FLRC Practice Station Number #1, “The Minefield Obstacle”**

| <b>Team</b> | <b>LTX<br/>Y/N</b> | <b>Team Name</b> | <b>Total Time to<br/>Complete Obstacle</b> | <b>Total Number of<br/>Penalties</b> |
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## Chapter 2 - Sub Set #1

### Overview

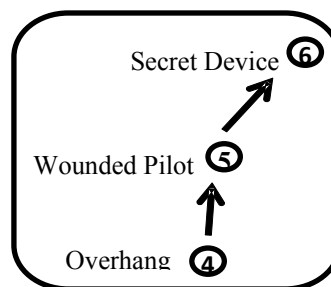
This chapter contains the FLRC Stations that make up Sub Set #1. A station is one of the 10 obstacles that make up the FLRC. Sub Set #1 includes the following stations on the western side of the FLRC:

Sub Set #1 Obstacle - FLRC Station #4 “Overhang”

Sub Set #1 Obstacle - FLRC Station #5 “The Wounded Pilot”

Sub Set #1 Obstacle - FLRC Station #6 “The Secret Device”

Sub Set #1 Back-Up Obstacle - FLRC Station #2 “Gorge of Doom”



A detailed description of each station, instructions, data collection and safety procedures are contained in this chapter. A back up station is included and will be used if one of the primary station aren't available or modified at the discretion of the battalion commander. The figure above shows the layout for the stations that make up Sub Set #1.

### Safety

Safety is of the upmost importance. Per Army protocol everyone on the course is also a safety officer and should stop training if an unsafe act is observed or about to occur. Controllers are located at each station to ensure safety procedures are followed and may designate safety officers as needed to protect participants negotiating the obstacles. Additionally, each station has safety instructions included in this booklet that controllers will read as part of the instructions prior to the team negotiating the obstacle. Should a safety incident occur, training will temporarily halt, the safety concern addressed and then training will continue.

### Data Collection

Participants and teams will choose a 4-6 character alpha numeric code for use throughout the training. Controllers and Observers will collect all data using these codes and not use any individuals name or other descriptors that may be used to connect data with an individual. See the Battalion Commander or LTX researcher (Brad Hilton) if there are questions about the collection of data.

## Sub Set #1 Obstacle - FLRC Station #4 “Overhang”

1. **Introduce Obstacle:** “Welcome to Station #4, The Overhang!”



2. **Mission:** Your mission is to get your team, plus the ammo crate across the obstacle and to your unit. For this task there is a wire fence supported by two trees (posts) with an overhanging beam above a mined area. The ground between the two posts are mined and cannot be touched by personnel or equipment. The same is applicable to the wire between the trees (posts), which represents a concertina wire fence. You have two ropes to utilize in solving this problem. ALL the equipment used must be taken by the team from the start to the end points. The ammo crate cannot be handled roughly or dropped in a way that would damage the contents. You may not use any of the surrounding trees (branches, rocks, etc) in solving your problem. If you touch the far side wood beam, you must remain on the far side and incur a 15 second penalty.
3. **Equipment:**
  - 1 x rope (8')
  - 1 x rope (30")
  - 1 x Wooden Ammo Box
4. **Safety Factors:** No touching the wire. Check knots for security. Always wear gloves when handling the rope. All weapons, when slung, will have the muzzle pointing down. Safeties are required for the completion of this obstacle.
5. **Team Leader has 1 minute for a leaders RECON.**

## **Notes for the FLRC Station Controller**

### **1. Controller Instructions**

- a. This task is normally difficult for most teams since it combines problem solving abilities with muscular strength and agility.
- b. On this task, a penalty occurs when a team member or any item of equipment touches the fence or mined area (wood beam around the obstacle & gravel)
- c. When a penalty occurs, the box or team members who make contact are returned to the start positions and incur a 15 second penalty before they may re-enter play. Members or equipment not involved in contact remain in play.
- d. Individuals may use a piece of LBE or other individual equipment such as a canteen to weight one end of the rope in order to aid in throwing the rope over the beam. Personal gear (such as snap links or 550 chord) may not be used. Personnel may sit on top of the beam.

### **2. Task Solution**

- a. Throw the rope across the bar and swing at least two members across. Hoist the ammo crate up and swing it across to the team members on the far side. When approximately 50% of the team has crossed, the direction of the pull changes from near side to far side. The rest of the team swings across the rope.
- b. All members plus the ammo crate must cross the obstacle safely.

### Data Collection - FLRC Station #4, “The Overhang”

| Team | LTX<br>Y/N | Team Name | Total Time to<br>Complete Obstacle | Total Number of<br>Penalties |
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## Sub Set #1 Obstacle - FLRC Station #5 “The Wounded Pilot”

1. **Introduce Obstacle:** “Welcome to Station #5, The Wounded Pilot!”



2. **Mission:** You are members of a rescue party that has been air-inserted into enemy territory to recover a wounded pilot and return him to friendly lines. You have just found the wounded officer. He has a badly sprained right leg. The enemy threat has made air-extraction impossible and your only route leads to a small ravine to your front. All the area between the two platforms is impassable. You cannot touch the ground with personnel or equipment. You must work with speed, as it will be dark within 18 minutes. You must take all equipment with you. Any individuals who fall into the pit cannot participate further in the extraction. All equipment with the fallen individual are considered destroyed and cannot be retrieved for use in the mission.

**NOTE TO CONTROLLER:** During this task, the wood beams are not off limits. However, forward of the wood beams towards the ravine is off limits. All personnel must wear a Swiss seat if any of the ropes are tied to the body, however, the obstacle may be crossed without the use of any rope.

3. **Equipment:**
  - 1 x Rope (20' long)
  - 14 x Swiss seats (12'-14' long)
  - 14 x Snap Links
  - 1 x Stretcher (Medical)
  - 1 x Dummy (145lbs)

4. **Safety Factors:** Always maintain three points of contact on the ropes. If hanging from a rope and unable to proceed further, always drop feet first. Do not tie ropes to a person (except for a Swiss seat). Always wear gloves while working with ropes. No more than 3 people may be on the wire at a time. Two safeties must be utilized during the negotiation of the obstacle. If crossing with a Swiss seat, sling weapons in front of body.
5. **Team Leader has one minute for a RECON.**

## Notes for the FLRC Station Controller

1. **Controller Instructions:** Give some consideration to any first aid methods the team does or does not deem fit to use as they handle the pilot and process him for movement.
  - a. There is a possible danger point when the stretcher reaches the far platform if there are insufficient members to unhook the stretcher from the rope, the weight of the pilot (145 lbs) could cause injury.
  - b. A penalty occurs when:
    - Any person or piece of equipment touches the ground in the “ravine” area.
    - The wounded pilot is handled roughly to the point where his injuries would be further compounded.
  - c. Penalize the team by having one member or piece equipment return to the starting point.
2. **Task Solution:** Send at least two members across the wire, with the last member of the group carrying one end of the free rope with the other end being tied to the litter. The rope should be used to pull the litter across the cable. Once the litter is across the ravine, the rest of the team should follow. While crossing the rope, individuals should have their legs wrapped around the wire, pull with their arms and have their heads pointed in the direction of travel. If the rope is tied to the body, it must be a Swiss seat.

All team members and equipment must get safely across to include the wounded pilot. The wounded pilot must be handled without incurring further injury.



**Data Collection - FLRC Station #5, “The Wounded Pilot”**

| <b>Team</b> | <b>LTX<br/>Y/N</b> | <b>Team Name</b> | <b>Total Time to<br/>Complete Obstacle</b> | <b>Total Number of<br/>Penalties</b> |
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## Sub Set #1 Obstacle - FLRC Station #6 “The Secret Device”

1. **Introduce Obstacle:** “Welcome to Station #6, The Secret Device!”



2. **Mission:** Your mission is to enter an enemy compound, steal a secret device that could be used to decipher our secret radio nets and leave the compound without detection. The enemy compound is surrounded by an electric fence and there are booby traps all around. A diversion will occupy the guards for 18 minutes. You cannot use the far pole to descend because it is booby trapped. All team members need not cross to complete the obstacle. Communication is not allowed between personnel outside the compound and those inside the compound; however, personnel inside the compound may communicate with one another. All poles with red tape are off limits. The area within the wood beams and gravel are mined. No more than three people are allowed on the obstacle at any given point in time.
3. **Equipment:**
  - 1 x rope (50' coil of rope)
  - 1 x Long Stick (7')
  - 1 Secret Device (size of PRC-27)
4. **Safety Factors:** No standing or kneeling on the horizontal beam. Individuals are not allowed to jump from the horizontal beam to the ground, but they may conduct a hanging drop. No weapons allowed on the obstacle. When crossing the beam, think safety.
5. **Team leader has one minute for a RECON.**

## Notes for the FLRC Station Controller

- 1. Controller Instructions:** A penalty occurs when member(s) contact any portion of the vertical beam or other areas considered to be mined or booby trapped.

If personnel or equipment incur a penalty, return the equipment or personnel to the start point and assess a 15 second penalty. If the secret device is dropped into an off limit area, return the entire crossing element to the start point. If any personnel fall into the minefield, then that person may no longer participate in the negotiation of the obstacle. There is no standing or kneeling on the horizontal beam.

Do not allow members to jump from the horizontal beam to the ground. Team members may conduct a hanging jump.

- 2. Task Solution:** Using a combination of initiative and available equipment, move an adequate number of team members across the obstacle to pick up the device and return.
  - a. All members do not need to cross.
  - b. All members deployed must return.
  - c. The secret device must be returned to the safe side during the time limit.

**Data Collection - FLRC Station #6, “The Secret Device”**

| <b>Team</b> | <b>LTX<br/>Y/N</b> | <b>Team Name</b> | <b>Total Time to<br/>Complete Obstacle</b> | <b>Total Number of<br/>Penalties</b> |
|-------------|--------------------|------------------|--|--------------------------------------|
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## **Sub Set #1 Back-Up Obstacle - FLRC Station #2 “Gorge of Doom”**

1. **Introduce Obstacle:** “Welcome to Station #2, The Gorge of Doom!”



2. **Mission:** Your mission is to get the team and two ammo boxes across a destroyed footbridge that spans a deep ravine in order to link up with your unit which is critically low on ammunition. The gorge is a 50 foot drop off and anything that falls into the gorge is considered to be a penalty. You have three planks available to assist in crossing the obstacle. All equipment must be taken with you. The ground between the vertical wood beam (all gravel) emplacement is minded and off limits.
3. **Equipment:**
  - 1 x plank (4inX4inX15ft)
  - 2 x boards (4inX4inX10ft)
  - 2 x empty ammo boxes
4. **Safety Factors:** Movement of the ropes could cause individuals to lose their balance. Maintain at least three points of contact with the plank(s) while crossing the obstacle. No jumping or throwing of equipment is allowed. Sitting on the posts are prohibited; however, they may be used for support.
5. **Team leader has one minute for a RECON.**

## **Notes for the FLRC Station Controller**

### **1. Controller Instructions**

- a. Safety is paramount; balance may be easily lost while crossing the plank.
- b. A penalty occurs when a team member or any item of equipment falls into the Gorge or makes contact with the ground surface area between the two log sandbag emplacements.
- c. When a penalty occurs, all personnel and equipment involved in the penalty must return to the start point and incur a 15 second penalty.

### **2. Task Solution**

- a. Any combination of use for the planks in negotiating the crossing is permissible. The crossing of the obstacles will normally require a relay of the short plank from the start to finish point while crossing members and ammo boxes.
- b. All team members and ammunition boxes must cross the obstacle.

### Data Collection - FLRC Station #2, “Gorge of Doom”

| Team | LTX<br>Y/N | Team Name | Total Time to<br>Complete Obstacle | Total Number of<br>Penalties |
|------|------------|-----------|------------------------------------|------------------------------|
| 1    |            |           |                                    |                              |
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## Chapter 3 - Sub Set #2

### Overview

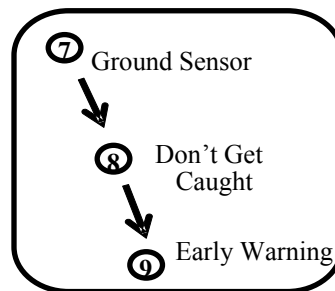
This chapter contains the FLRC Stations that make up Sub Set #2. A station is one of the 10 obstacles that make up the FLRC. Sub Set #2 includes the following stations on the eastern side of the FLRC:

Sub Set #2 Obstacle - FLRC Station #7 “Ground Sensors”

Sub Set #2 Obstacle - FLRC Station #8 “Don’t Get Caught”

Sub Set #2 Obstacle - FLRC Station #9 “Early Warning”

Sub Set #2 Back-Up Obstacle - FLRC Station #10 “Bridge of No Return”



A detailed description of each station, instructions, data collection and safety procedures are contained in this chapter. A back up station is included and will be used if one of the primary station isn't available or at the discretion of the battalion commander. The figure above shows the layout for the stations that make up Sub Set #2.

### Safety

Safety is of the upmost importance. Per Army protocol everyone on the course is also a safety officer and should stop training if an unsafe act is observed or about to occur. Controllers are located at each station to ensure safety procedures are followed and may designate safety officers as needed to protect participants negotiating the obstacles. Additionally, each station has safety instructions included in this booklet that controllers will read as part of the instructions prior to the team negotiating the obstacle. Should a safety incident occur, training will temporarily halt, the safety concern addressed and then training will continue.

### Data Collection

Participants and teams will choose a 4-6 character alpha numeric code for use throughout the training. Controllers and Observers will collect all data using these codes and not use any individuals name or other descriptors that may be used to connect data with an individual. See the Battalion Commander or LTX researcher (Brad Hilton) if there are questions about the collection of data.



## Sub Set #2 Obstacle - FLRC Station #7 “Ground Sensors”

1. **Introduce Obstacle:** “Welcome to Station # 7, Ground Sensors!”



2. **Mission:** Move four boxes of ground sensors and your team to the ground sensor platoon forward of your position. Mortars have destroyed previous sensors and the enemy has minded and booby trapped the area where your team must cross. The nearest cleared lane in the area is 500 meters west of here. The mission is time sensitive as the ground sensors must be in place by dark. Therefore, this is the only crossing site. The plank, rope and sandbags may be used to cross the obstacle. No personnel or equipment (board, rope, ground sensors, etc.) may come in contact with any part of the obstacle.
3. **Equipment:**
  - 1 x Rope (25' long)
  - 1 x Plank (2x8x10' long)
  - 4 x Ammo box 105 mm box with sandbag inside)
  - 2 x Sandbags (place on center pole)
  - 1 x Stump (in place)
4. **Safety Factors:** Do not attempt to jump over or from the obstacle. Do not throw the ground sensors across the obstacle.
5. **Team Leader has 1 minute for a leaders RECON.**

### Notes for the FLRC Station Controller

1. **Controller Instructions:** The pole has been placed permanently in the ground for safety reasons. The crossing plank cannot come in contact with any mines, walls or bracing.

Penalties occur when:

- a. A plank contacts any component or surface of the fence or mine.
- b. An individual touches any surface of the fence or mines.
- c. The ammo box makes contact with the fence surface or mines.

When a penalty occurs, the plank, boxes or individuals making contact are returned to the start position and will incur a 15 second penalty before they may re-enter play. The team member or equipment not involved in the contact remains in play.

2. **Task Solution:** Team members must use the plank to safely cross the obstacle. The rope may be used to stretch across the obstacle to another individual and pass the ammo box to them rather than being carried across the barrier.

All team members and ammo boxes must safely cross the barrier.

**Data Collection - FLRC Station #7, “Ground Sensor”**

| <b>Team</b> | <b>LTX<br/>Y/N</b> | <b>Team Name</b> | <b>Total Time to<br/>Complete Obstacle</b> | <b>Total Number of<br/>Penalties</b> |
|-------------|--------------------|------------------|--|--------------------------------------|
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## Sub Set #2 Obstacle - FLRC Station #8 “Don’t Get Caught”

1. **Introduce Obstacle:** “Welcome to Station #8, Don’t Get Caught!”



2. **Mission:** Your mission is to cross the double fence with a box of ammo and the team before a roving patrol returns. Use the equipment placed near the fence to assist you. The fence and areas between is booby trapped and mined. You cannot go around the fence. You are not required to take the log or ropes across the obstacle. The enemy patrol passes every 15 minutes and has just passed.
3. **Equipment:**
  - 1 x Square plank (4inX4inX16ft)
  - 1 x Pole (2” x 10’ long)
  - 1 x Rope (8’ long (1 ¼” Diameter)
  - 1 x Can (Ammo Can)
4. **Safety Factors:** Ensure the horizontal log fully extends to or beyond the far wall before jumping to the ground. The walls and the areas between them are off limits. Watch hands and fingers when working with logs. Do not throw any equipment over the wall to the other side. Do not stand under any log structure or between the wall and a log structure. Do not attempt to jump over the obstacle.

**NOTE TO CONTROLLERS:** Choose two safety personnel and position between the double walls. Ensure that they are attentive and protect the individuals from falls while attempting to cross the obstacle.

5. **Team Leader has 1 minute for a leaders RECON.**

### Notes for the FLRC Station Controller

1. **Controller Instructions:** This task is normally difficult to solve in the 15 minute time limit. As such, it should produce mild frustration in most groups.

On this task a penalty occurs when:

- a. A team member touches any part of the fence or ground between the fences.
- b. Equipment touches the fence or ground between the fences.
- c. The ammunition box is dropped in an off limits area.

When a penalty occurs, the team and equipment must be brought back to the starting side and a 15 second penalty is imposed. Individuals and equipment already across the obstacle may remain in place.

2. **Task Solution:** The key to this task is the forming of a tripod or bipod using the shorter poles and using the long pole to extend over the fence.
  - a. All team members must cross the obstacle.
  - b. The obstacle must be completed within the time limits.

**Data Collection - FLRC Station # 8, “Don’t Get Caught”**

| <b>Team</b> | <b>LTX<br/>Y/N</b> | <b>Team Name</b> | <b>Total Time to<br/>Complete Obstacle</b> | <b>Total Number of<br/>Penalties</b> |
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## Sub Set #2 Obstacle - FLRC Station #9 “Early Warning”



1. **Introduce Obstacle:** “Welcome to Station #9, Early Warning!”
2. **Mission:** Cross the minefield and obstacle with your complete team, taking a box of warning devices to a defensive position approximately 100 meters from your current location. You may use the logs located around the obstacle to assist in negotiating the obstacle. All equipment used (logs) in negotiating the obstacle must be taken with you to the other side of the obstacle. All areas to the left and to the right of the obstacle are to be considered mined. None of the equipment may touch the ground in this area.
3. **Equipment:**  
2 x logs (5” x 10’ box)  
1 x ammo box
4. **Safety Factors:** There is the potential for the logs(s) which are being used to cross the obstacle to roll and for the individuals to lose their balance. Individuals must maintain 3 points of contact while negotiating the obstacle.

## Notes for the FLRC Station Controller

### 1. Controller Instructions:

- a. Pay attention to safety in and around the obstacle. If you have any doubts about the stability of individuals on the obstacle, don't hesitate to take action and use safety personnel.
- b. On this task, a penalty occurs when an individual enters the designated minefield area whether by a fall or stepping onto the area inadvertently or when log(s) or warning device container falls into the mined area.

### 2. Task Solution: One means of solving this problem is to use logs leaned against the near side of the obstacle and then move at least two individuals to the top of the obstacle. These individuals may remain on the obstacle to use the logs in a relay system to then move other members and warning devices from the near side of the obstacle and then transfer the members from the obstacle to the far side.

- a. All members must cross the obstacle.
- b. Crossing the obstacle must be completed within the time limits.
- c. Team leaders may employ a number of various combinations for using the boards to cross the minefield. They will probably use a "relay system" of boards and individuals to cross within the time limits.
- d. All team members, the ammo box and the equipment they used in the solution must cross the barrier to the other side.



**Data Collection - FLRC Station #9, “Early Warning”**

| <b>Team</b> | <b>LTX<br/>Y/N</b> | <b>Team Name</b> | <b>Total Time to<br/>Complete Obstacle</b> | <b>Total Number of<br/>Penalties</b> |
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| 14          |                    |                  |  |                                      |
| 15          |                    |                  |  |                                      |

## Sub Set #2 Back-Up Obstacle - FLRC Station #10 “Bridge of No Return”

1. **Introduce Obstacle:** “Welcome to Station #10, Bridge of No Return!”



2. **Mission:** Your mission is to take a 55 gallon drum of fuel to your unit which is on the far side of the stream. However, the center span of the bridge back to your unit has been destroyed by enemy sappers. The only materials available to assist you in crossing the bridge are 3 heavy planks and a rope. All team members must cross, bring with them the 3 planks, rope, and the fuel drum. Personnel and equipment may not touch the ground beneath the bridge or any structures supporting the bridge. All areas to the left and right are mined.

**NOTE TO CONTROLLER:** 55 gallon drum represents a full barrel.

3. **Equipment:**
  - 1 x plank (4" X12" X 8')
  - 2 x planks (4" X 12" X 10')
  - 1 x Oil Drum (55 gallon drum that is half full)
  - 1 x Rope (20')
4. **Safety Factors:** No jumping. No throwing of any equipment. No lifting and carrying the fuel drum, it must be rolled.

**NOTE TO CONTROLLER:** 2 spotters are to be placed in the pit before any team member begins to physically cross the obstacle. Do not allow any team member to go out on an extended plank without sufficient weight on the end of the plank.

5. **Team Leader has 1 minute for a leaders RECON.**

## **Notes for the FLRC Station Controller**

### **1. Controller Instructions:** A penalty occurs when:

- a. A plank is lost in the “stream” between the two spans of the bridge.
- b. A team member falls into the stream.
- c. The 55 gallon drum is dropped into the stream.

When a plank or team member falls into the stream penalize the team 15 seconds. If the barrel is dropped into the stream, have it returned to the starting positions and penalize the team by having them start over.

### **2. Task Solution**

- a. The key to this task is in the positioning of the plank and placing sufficient weight on the critical end of the supporting plank.
- b. All team members must get across the bridge.
- c. The drum must be moved from one bridge section to the other.

**Data Collection - FLRC Station #10, “Bridge of No Return”**

| <b>Team</b> | <b>LTX<br/>Y/N</b> | <b>Team Name</b> | <b>Total Time to<br/>Complete Obstacle</b> | <b>Total Number of<br/>Penalties</b> |
|-------------|--------------------|------------------|--|--------------------------------------|
| 1           |                    |                  |  |                                      |
| 2           |                    |                  |  |                                      |
| 3           |                    |                  |  |                                      |
| 4           |                    |                  |  |                                      |
| 5           |                    |                  |  |                                      |
| 6           |                    |                  |  |                                      |
| 7           |                    |                  |  |                                      |
| 8           |                    |                  |  |                                      |
| 9           |                    |                  |  |                                      |
| 10          |                    |                  |  |                                      |
| 11          |                    |                  |  |                                      |
| 12          |                    |                  |  |                                      |
| 13          |                    |                  |  |                                      |
| 14          |                    |                  |  |                                      |
| 15          |                    |                  |  |                                      |

## **Acronyms**

|       |                                    |
|-------|------------------------------------|
| BN    | Battalion                          |
| FA    | Field Artillery                    |
| FLRC  | Field Leaders Reaction Course      |
| LTX   | Leader Team Exercise               |
| NCO   | Non-Commissioned Officer           |
| NCOIC | Non-Commissioned Officer in Charge |
| OIC   | Officer in Charge                  |

## **Appendix E - Informed Consent Form**

### **KANSAS STATE UNIVERSITY INFORMED CONSENT**

**PROJECT TITLE:** Impacts of the Leader Team Exercise on Team Performance

**APPROVAL DATE OF PROJECT:** TBD

**EXPIRATION DATE OF PROJECT:** TBD

**PRINCIPAL INVESTIGATOR:** Dr. Jane Fishback, Associate Professor, Department of Education Leadership, Kansas State University

**CO-INVESTIGATOR(S):** Mr. Bradley C. Hilton

**CONTACT NAME AND PHONE FOR ANY PROBLEMS/QUESTIONS:** Dr. Jane Fishback, Bluemont Hall, Kansas State University.

#### **IRB CHAIR CONTACT/PHONE INFORMATION:**

Rick Scheidt, Chair, Committee on Research Involving Human Subjects, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.

Jerry Jaax, Associate Vice President for Research Compliance and University Veterinarian, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.

**SPONSOR OF PROJECT:** None.

**PURPOSE OF THE RESEARCH:** This dissertation research involves the investigation into the Leader Team Exercise (LTX), which was developed by the U.S. Army as a methodology to build effective teams faster in diversified environments. The LTX has been implemented by the U.S. European Command Headquarters and units within the Army with positive observations on its effectiveness. This study intends to examine those findings in an experimental design setting to better understand the observations from the field.

**PROCEDURES OR METHODS TO BE USED:** Participants will be asked to complete challenges on the Fort Riley Leadership Reaction Course (FLRC) and then a second time employing the Leader Team Exercise. In addition to the FLRC, participants are asked to complete a survey pretest, intermediate test and posttest to measure team member's sense of shared confidence and shared understanding of the team's ability to negotiate the FLRC.

**ALTERNATIVE PROCEDURES OR TREATMENTS, IF ANY, THAT MIGHT BE ADVANTAGEOUS TO SUBJECT:** None.

**LENGTH OF STUDY:** The estimated length of the study is about 4 hours.

**RISKS OR DISCOMFORTS ANTICIPATED:** There are no known risks beyond those normally associated with negotiating the Fort Riley, Field Leaders Reaction Course. There is no additional risk to using the Leader Team Exercise.

**BENEFITS ANTICIPATED:** Training and practical experience in employing the Leader Team Exercise that will provide another leadership tool for use in the future. Participants also benefit from training on the Field Leaders Reaction Course that can also be used in the future.

**EXTENT OF CONFIDENTIALITY:** All data collected on team performance and individual surveys will be done using random identifiers to protect the identity of individual participants. The researcher and the Unit chain of command will not know the identity of individual responses or teams.

**MEDICAL TREATMENT AVAILABLE IF INJURY OCCURS:** Medical care is on the Field Leaders Reaction Course per Fort Riley Range Control procedures to include combat lifesavers and dedicated transportation to local hospital.

**PARENTAL APPROVAL FOR MINORS:** Not Applicable.

**TERMS OF PARTICIPATION:** I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled.

**I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.**

Participant Name: \_\_\_\_\_ Date: \_\_\_\_\_

Participant Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Witness to Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix F - Participant Information Form

### Field Leaders Reaction Course Participant Information Form

Please choose a 4-6 character alpha numeric code for use throughout the training. Use this code on all future surveys and in team assignment. Please do NOT put your name on any of the forms.

Individual Unique Identifier: \_\_\_\_\_

Team Unique Identifier: \_\_\_\_\_

Rank: \_\_\_\_\_

Age: \_\_\_\_\_

Gender: \_\_\_\_\_

Years of Military Service (from date of initial entry, either active or reserve): \_\_\_\_\_

Fort Riley, Field Leadership Reaction Course (FLRC) Experience:

Yes: \_\_\_\_\_ No: \_\_\_\_\_

If Yes, how long since your last training event (years/months): \_\_\_\_\_



## Appendix G - Example of Teams of Leaders (ToL) Surveys

### Teams of Leaders Survey #1 (Pre-Survey)

Please write in your individual and team unique identifier on the lines below. Also complete the questions below based on your sense of the team's ability to negotiate the obstacles on the Field Leaders Reaction Course. Please only consider the team's ability for the course and not the unit's mission or operations.

Individual Unique Identifier: \_\_\_\_\_ Team Unique Identifier: \_\_\_\_\_

| Please rate your opinion on the team's ability to accomplish the following as part of the Field Leaders Reaction Course | Strongly Disagree | Disagree | Undecided/Neutral | Agree | Strongly Agree |
|---|-------------------|----------|-------------------|-------|----------------|
|   | 1                 | 2        | 3                 | 4     | 5              |
| The team has the same overall understanding of purpose  |                   |          |                   |       |                |
| Our team discusses and reviews clear, simple goals and objectives   |                   |          |                   |       |                |
| Our team follows an accepted process for doing similar work   |                   |          |                   |       |                |
| Our team develops and reviews measures of effectiveness and milestones  |                   |          |                   |       |                |
| We have an effective way to communicate a shared understanding with all team members                                    |                   |          |                   |       |                |
| Everyone on our team has freedom and flexibility to do their work   |                   |          |                   |       |                |
| Our team continuously clarifies roles, responsibilities, and competencies   |                   |          |                   |       |                |
| Members of our team are encouraged to lead and to follow as appropriate   |                   |          |                   |       |                |
| If a team member does not have the required knowledge, he/she is willing to ask for help                                |                   |          |                   |       |                |
| Our team has clear milestones and courses of action   |                   |          |                   |       |                |
| All team members are aware of ongoing key team requirements   |                   |          |                   |       |                |
| Task timelines for our team are collaboratively established   |                   |          |                   |       |                |
| Knowledge is shared effectively within the team   |                   |          |                   |       |                |
| Lessons Learned are captured and effectively used to improve the team   |                   |          |                   |       |                |
| The team has an effective way for capturing and sharing knowledge   |                   |          |                   |       |                |

## Appendix H - FLRC Performance Data Results

| Pre-LTX Treatment  |                |           |                |           |                |           |                |           |                  |           |                |           |
|--------------------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|------------------|-----------|----------------|-----------|
| Team               | Sub Set 1      |           |                |           |                |           | Sub Set 2      |           |                  |           |                |           |
|                    | Station #4     |           | Station #5     |           | Station #6     |           | Station #7     |           | Station #8       |           | Station #9     |           |
|                    | Overhang       |           | Wounded Pilot  |           | Secret Device  |           | Ground Sensor  |           | Don't Get Caught |           | Early Warning  |           |
|                    | Time (seconds) | Penalties | Time (seconds) | Penalties | Time (seconds) | Penalties | Time (seconds) | Penalties | Time (seconds)   | Penalties | Time (seconds) | Penalties |
| Team A             | 601            | 3         | 675            | 0         | 384            | 0         |                |           |                  |           |                |           |
| Team B             | 772            | 6         | 272            | 0         | 524            | 0         |                |           |                  |           |                |           |
| Team C             | 930            | 2         | 760            | 0         | 141            | 0         |                |           |                  |           |                |           |
| Team D             | 1005           | 7         | 493            | 1         | 222            | 0         |                |           |                  |           |                |           |
| Team E             | 755            | 11        | 605            | 0         | 168            | 0         |                |           |                  |           |                |           |
| Team F             | 1065           | 15        | 239            | 13        | 270            | 0         |                |           |                  |           |                |           |
| Team G             |                |           |                |           |                |           | 595            | 6         | 495              | 0         | 267            | 1         |
| Team H             |                |           |                |           |                |           | 550            | 4         | 900              | 0         | 256            | 2         |
| Team I             |                |           |                |           |                |           | 647            | 8         | 686              | 1         | 250            | 3         |
| Team J             |                |           |                |           |                |           | 639            | 3         | 900              | 1         | 401            | 2         |
| Team K             |                |           |                |           |                |           | 610            | 3         | 556              | 0         | 184            | 1         |
| Average            | 855            | 7         | 507            | 2         | 285            | 0         | 608            | 5         | 707              | 0         | 272            | 2         |
| Post LTX Treatment |                |           |                |           |                |           |                |           |                  |           |                |           |
| Team               | Sub Set 1      |           |                |           |                |           | Sub Set 2      |           |                  |           |                |           |
|                    | Station #4     |           | Station #5     |           | Station #6     |           | Station #7     |           | Station #8       |           | Station #9     |           |
|                    | Overhang       |           | Wounded Pilot  |           | Secret Device  |           | Ground Sensor  |           | Don't Get Caught |           | Early Warning  |           |
|                    | Time (seconds) | Penalties | Time (seconds) | Penalties | Time (seconds) | Penalties | Time (seconds) | Penalties | Time (seconds)   | Penalties | Time (seconds) | Penalties |
| Team A             |                |           |                |           |                |           | 646            | 3         | 681              | 1         | 299            | 2         |
| Team B             |                |           |                |           |                |           | 532            | 1         | 520              | 1         | 190            | 0         |
| Team C             |                |           |                |           |                |           | 783            | 7         | 235              | 4         | 202            | 0         |
| Team D             |                |           |                |           |                |           | 616            | 5         | 900              | 1         | 103            | 2         |
| Team E             |                |           |                |           |                |           | 506            | 2         | 452              | 4         | 267            | 1         |
| Team F             |                |           |                |           |                |           | 712            | 6         | 526              | 1         | 326            | 1         |
| Team G             | 1020           | 8         | 441            | 0         | 538            | 0         |                |           |                  |           |                |           |
| Team H             | 617            | 4         | 566            | 1         | 315            | 0         |                |           |                  |           |                |           |
| Team I             | 456            | 4         | 322            | 0         | 169            | 0         |                |           |                  |           |                |           |
| Team J             | 281            | 5         | 359            | 0         | 206            | 0         |                |           |                  |           |                |           |
| Team K             | 502            | 3         | 406            | 0         | 200            | 0         |                |           |                  |           |                |           |
| Average            | 575            | 5         | 419            | 0         | 286            | 0         | 633            | 4         | 552              | 2         | 231            | 1         |

## Appendix I - Survey Data Results - Average by Question

| Teams of Leaders Survey Questions<br>(Pre-Mid-Post Tests)   | Mean          |               |               |
|---|---------------|---------------|---------------|
|   | Survey<br># 1 | Survey<br># 2 | Survey<br># 3 |
| The team will have the same understanding of how to negotiate the obstacles.                                      | 3.35          | 4.28          | <b>4.51</b>   |
| Our team will discuss and review goals and objectives to complete the obstacles.                                  | 3.98          | 4.37          | <b>4.51</b>   |
| Our team will follow an accepted process to complete the obstacles  | 3.77          | 4.37          | <b>4.45</b>   |
| Our team will develop and review procedures to effectively complete the obstacles.                                | 3.82          | 4.34          | <b>4.54</b>   |
| We have an effective way to communicate with all team members.  | 3.79          | 4.45          | <b>4.46</b>   |
| Everyone on our team has the freedom and flexibility to do their work.  | 3.77          | 4.38          | <b>4.45</b>   |
| Our team continuously clarifies roles, responsibilities, and competencies before, during and after each obstacle. | 3.59          | 4.03          | <b>4.42</b>   |
| Members of our team are encouraged to lead and to follow as appropriate.  | 3.8           | 4.32          | <b>4.45</b>   |
| If a team member does not know how to complete the obstacles, he/she is willing to ask for help.                  | 3.67          | 4.4           | <b>4.43</b>   |
| Our team has clear courses of action or sequence of steps to complete the obstacles                               | 3.39          | 4.22          | <b>4.49</b>   |
| All team members are aware of key team requirements and team member's needs.                                      | 3.5           | 4.26          | <b>4.57</b>   |
| Timelines for our team are collaboratively established.   | 3.42          | 4.12          | <b>4.4</b>    |
| Knowledge is shared effectively within the team.  | 3.62          | 4.34          | <b>4.52</b>   |
| Lessons Learned are captured and effectively reused to improve the team.  | 3.53          | 4.32          | <b>4.54</b>   |
| The team has an effective way for identifying and sharing ways to complete the obstacles.                         | 3.59          | 4.4           | <b>4.51</b>   |

| Teams of Leaders Survey Questions<br>(Pre-Mid-Post Tests)   | Mode          |               |               |
|---|---------------|---------------|---------------|
|   | Survey<br># 1 | Survey<br># 2 | Survey<br># 3 |
| The team will have the same understanding of how to negotiate the obstacles.                                      | 4             | 4             | 5             |
| Our team will discuss and review goals and objectives to complete the obstacles.                                  | 4             | 4             | 5             |
| Our team will follow an accepted process to complete the obstacles  | 4             | 4             | 5             |
| Our team will develop and review procedures to effectively complete the obstacles.                                | 4             | 5             | 5             |
| We have an effective way to communicate with all team members.  | 4             | 5             | 5             |
| Everyone on our team has the freedom and flexibility to do their work.  | 4             | 4             | 5             |
| Our team continuously clarifies roles, responsibilities, and competencies before, during and after each obstacle. | 4             | 4             | 5             |
| Members of our team are encouraged to lead and to follow as appropriate.  | 4             | 4             | 5             |
| If a team member does not know how to complete the obstacles, he/she is willing to ask for help.                  | 4             | 4             | 5             |
| Our team has clear courses of action or sequence of steps to complete the obstacles                               | 3             | 4             | 5             |
| All team members are aware of key team requirements and team member's needs.                                      | 4             | 4             | 5             |
| Timelines for our team are collaboratively established.   | 3             | 4             | 5             |
| Knowledge is shared effectively within the team.  | 4             | 4             | 5             |
| Lessons Learned are captured and effectively reused to improve the team.  | 4             | 4             | 5             |
| The team has an effective way for identifying and sharing ways to complete the obstacles.                         | 4             | 4             | 5             |