LEADER CHALLENGE: WHAT WOULD YOU DO?

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ABSTRACT

Given the complex environment in which the U.S. military operates, leaders at all levels must be prepared for a force that is more responsive to regional combatant commanders needs, better employs joint capabilities, facilitates force packaging and rapid deployment, and fights self contained units in non-linear, non-contiguous battle space. This project's goal is to provide computer-mediated environments for learning from simulated leadership challenges within the discussion space of professional forums. The primary tool used in the project is the Simulated Cognitive Leadership Challenge, "Leader Challenge," a platform where Soldiers can construct solutions to various scenarios presented to them by their peers and/or predecessors.

The U.S. Army's web-based peer-to-peer professional forums provide a good avenue to explore multi-modal, distributed, asynchronous education to troops deployed in a combat environment. These forums provide a collaborative learning environment where the "field" Army and the institutional Army education system (the "schoolhouse") can overlap in a distributed and powerful manner.

These professional forums (namely the PlatoonLeader and CompanyCommand forums) employ a variety of techniques to foster connections, content, and conversation—all with the goal of improving member effectiveness and advancing the practice. The particular intervention discussed herein is a cognitive constructive simulation based on dialogue interviews.

Currently, over 3200 participants have provided data. Overall, participants found the Leader Challenges engaging and worthwhile. Participants reflect learning through an increase in response quality from pre-test to post-test. Participants also report increased perceptions of self-efficacy from initial engagement in the Leader Challenge modules to the exit surveys.

KEYWORDS

experiential learning, tacit knowledge, leader development, meta-cognition, professional forum, self-awareness

I. INTRODUCTION

Listen to the voice of a U.S. Army Platoon Leader serving in Iraq:

"We were headed out to a pretty easy mission. My front truck reports that there's a dead body under a car in the middle of the road. He was on the ground. He had been in his car and he had been shot. At that point, the gunner from my lead truck noticed a double-decker bus that had stopped. And there was a guy up on the top deck who appeared to have a blue video camera, and he was just hanging out the window video-taping us. Our rules of engagement permitted us to engage anybody video-taping an attack. I looked down my sight and noticed the same thing. The gunner looked through binos and noticed the same thing. He asked me, 'Hey sir, can I go ahead and shoot him?'" [1]?

What Would You Do?

This simple question is being asked to thousands of young officers and cadets throughout the Army as a means to drive learning and awareness, and to build confidence regarding the situations they may face in the Army. These young leaders are gaining valuable experience and insights through hundreds of recent first-person account video scenarios that conclude with the question: "What Would You Do?"

These multi-media modules are delivered through a web-based tool called, "Leader Challenge," which is being used within the U.S. Army's *PlatoonLeader* and *CompanyCommand* professional forums [1] to prepare young leaders for the situations they may face on the job.

Since initial testing of the Leader Challenge tool began in 2006, more than 3200 participants have provided data. Overall, participants reflected learning through an increase in response quality from pre-test to post-test. Participants also reported increased perceptions of self-efficacy throughout the Leader Challenge Experience. The professional forum delivery platform allows for distributed learning and development to an ever-deployed force. The result of this intervention is a more confident and knowledgeable group of young officers ready to face the crucible experiences of life in the Army.

II. BACKGROUND

The wartime U.S. Army has been facing training and education challenges associated with (1) a globally distributed workforce in over 120 countries, and (2) a complex and constantly changing environment, one in which Soldiers' actions will change the nature of the milieu in unpredictable ways. This reality creates a context in which the traditional training and education model struggles to maintain pace, a context that requires a living, adaptive curriculum.

In November 2008, the U.S. Army hosted a Leader Development Summit at Ft. Leavenworth, Kansas to evaluate the Army's Leader Development model. Participants there concluded that the Army was too focused on institutional training and education to meet war-time leadership development needs. They agreed that "at least 80% of Leadership Development occurs in units/organizations...and generally ignores the Leader Development requirements of the operational and self-development domains" [2].

As a result, the Commander of the U.S. Army's Training and Doctrine Command, General Martin Dempsey, embarked on a campaign to overhaul methods of educating the force to enhance Leader

Development, saying, "We may not necessarily deliver education the way we have in the past, but I don't know yet. It may not all be in the brick and mortar schoolhouse" [3].

The Army's traditional leader development model rests upon three primary pillars: Training, Education, and Experience. But given the extensive demands that are currently being placed on the Army as an organization, and the minimal time in service these leaders have (5-9 years), relative to the amount of responsibility they are given, a great proportion of Soldiers' training and education has been occurring in daily experiences. Furthermore, several studies outside of the military sector reinforce the concept that leader effectiveness depends on the capacity to learn, and that experience is at the core of leader learning and development [4]-[11].

In late 2009, the Army Leader Development Strategy outlined eight imperatives for leader development, one of which is to bring the operational environment into the classroom, to better blend the experience pillar with the training and education pillars [12]. "The strategy challenges us to enrich leader training and education by leveraging technology and adapting training methodologies to replicate complexity and hybrid threats in the classroom, at home station, and while deployed."

In late 2010, Dempsey introduced his vision for a 2015 "Army Learning Concept" to adapt to the Army's changing needs. "We are going to cut the chaff and augment the most effective aspects of our current learning system while ensuring relevant and rigorous training and education is available and accessible, and not just on the institutional side of the Army" [13]. In a February, 2011 article in Army Magazine, Dempsey introduced "a series of substantive adaptations to rebalance the three pillars of leader development--training, education, and experience." This includes a plan to "...pull streams of real world data from current operations in Iraq and Afghanistan, declassify it, and use it to build realistic scenarios to support training throughout the Army" [14]. The U.S. Army's rebalancing of the three pillars of leader development seems to include a tighter integration of the three--by fostering training and educating *during* the experience and by infusing recent, relevant experiences into the classroom through an emphasis on technology and collaboration.

III. LEARNING FROM EXPERIENCE

Conceptual frameworks of learning centered on experience are appropriate to address learning in the U.S. Army's current operating environment [4, 15]. Through this lens, learning can be viewed as a continual process in which new knowledge is created by reflecting on past experiences and integrating them with the present [4, [16, 17]. According to Kolb, "Learning is the process whereby knowledge is created through the transformation of experience" [4].

Mezirow believes that meaning is constructed from prior experience, "to make meaning is to construe or interpret experience" [18]. He states, "However good we are at making sense of our experiences, we all have to start with what we have been given and operate within horizons set by ways of seeing and understanding that we have acquired through prior learning" [17].

[4] Kolb coined the term "experiential learning" to delineate his learning model—a model that consists of four steps in a continuous process: concrete experience, reflective observation, abstract generalizations, and active experimentation.
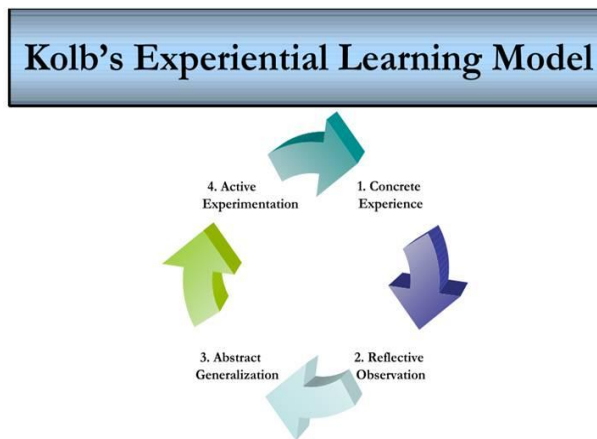
Figure 1: Kolb's Experiential Learning Model [19]

- *Concrete Experience* involves engaging in action—it is giving a speech as compared to reading about giving a speech. This engagement with the physical world will involve all of the learner's senses and is a source of knowledge.
- *Reflective Observation* involves being mindful of and reflecting upon what is happening during and after the experience. This might include identifying what the outcomes were (both expected and unexpected), becoming aware of opportunities for improvement, and comparing what actually occurred with what was planned. The inputs for this process emerge from a broad range of sources, including personal observation, feedback from others and quantitative data. This is what Donald Schon would refer to as praxis—reflection being informed by action and action in turn being informed by reflection [20].
- *Abstract Generalizations* are the result of reflective observation. In this step the learner takes the observations made and turns them into advice for the future—the learner generalizes from the specific. This advice incorporates past learning and experience and guides future action.
- *Active Experimentation* requires that the learner process options for new action based on the learning constructed from concrete experience, and then apply these options to future experiences—thus moving the learner back to the first step in the cycle (concrete experience).

Kolb states that, "In the process of learning, one moves in varying degrees from actor [within the experience] to observer [of oneself], and from specific involvement to general analytic detachment" [4]. Kolb's model would suggest that the process of developing leaders must necessarily draw from the experiences leaders are having daily in their work. It would also suggest that the process of reflective observation, distilling lessons for the future, and applying those lessons to subsequent work experience facilitates a leader's learning. And finally, Kolb's model asserts that the process is continuous, that "ideas are not fixed and immutable elements of thought but are formed and re-formed through experience" [4]. The significance of reflection to learning is also emphasized by Boud and Walker, who state that "Reflection consists of those processes in which learners engage to recapture, notice and re-evaluate their experience, to work with their experience, to turn it into learning" [21].

Experiential learning would dictate that, just as the best way to learn rock-climbing is through the experience of climbing itself, the best way to become a more effective leader is to lead. Knowledge of leadership flows from on-the-job experience and reflection upon that experience. It is one thing to sit passively in a classroom and receive instruction on how to climb, and it is yet another to be placed on the face of a mountain. In a similar manner, there are great differences between receiving a lesson on leadership and being placed in a leadership role [4].

Kouzes and Posner's writings on leader development parallel the experience emphasis of adult learning literature. They found through extensive qualitative interviews that leaders learn through experience, and that leaders described their own development through experiences that were challenging [22]. McCall found the same to be true, stating, "The intellectual repartee of the classroom has a certain appeal, but when asked to recount events that changed them significantly, successful executives…described powerful, challenging experiences…" [23].

Leadership scholars at the Center for Creative Leadership likewise found that novel and challenging experiences are most developmental in a leader's growth. They also add to this framework the need for pre-experience preparation, post-experience assessment, and an on-going supportive environment [24]. They agree with Kolb that it is not just challenging experience that develops the leader but an *assessed,* challenging experience. It is in the process of assessment and making-sense of an experience that the leader becomes aware of what was learned, and identifies future learning that is needed. Assessment occurs both through individual reflection and feedback from others. And support is often most suitably provided in a trusted mentoring relationship. Both of these—assessment and support—facilitate the leader's ability to make sense of experiences, thus identifying strengths to be leveraged and weaknesses to be developed [24].

These researchers put leader experience in the spotlight and build key elements around that experience in order to leverage it for learning—challenge, self-awareness, assessment, feedback, and support. In this framework, experience is the prime vehicle for learning—but it is not experience alone. As research indicates, there are certain types of experiences that are more effective at eliciting learning than others, including those having the characteristics of novelty and challenge.

Leaders in the U.S. Army are able to discern situations, make decisions, innovate, and intuit by drawing from a nearly infinite range of personal experiences, educational interventions, and training events, much of which is not explicit, but presents itself only when prompted by the demands of the environment. The problem the Army faces is that many of the young leaders who will face novel, challenging experiences on the battlefield must do so without any training or education that prepares them for those experiences. So how can the Army best prepare its novices for these experiences beforehand? How can the Army most effectively expose its novices to the experiences of its experts? And in doing so, how can the Army pass experienced leaders' hard-earned knowledge on to this next generation of leaders.

IV. TACIT KNOWLEDGE

As Polanyi states, "I shall reconsider human knowledge by starting from the fact that we can know more than we can tell" [25]. This embedded knowledge--those things we know, but can't tell--forms the basis for creativity, adaptability, and judgment on the battlefield. The following vignette was featured in a *New Yorker* article in 2005, and it highlights the embedded knowledge of experts in the U.S. Army:

"A small unit of American soldiers was walking along a street in Najaf when hundreds of Iraqis poured out of the buildings on either side. Fists waving, throats taut, they pressed in on the Americans, who glanced at one another in terror...The Iraqis were shrieking, frantic with rage. From the way the lens was lurching, the cameraman seemed as frightened as the soldiers...At that moment, an American officer stepped through the crowd holding his rifle high over his head with the barrel pointed to the ground...'Take a knee,' the officer said, impassive behind surfer sunglasses. The soldiers looked at him as if he were crazy. Then, one after another, swaying in their bulky body armor and gear, they knelt before the boiling crowd and pointed their guns at the ground. The Iraqis fell silent, and their anger subsided. The officer ordered his men to withdraw" [26].

This example portrays an Army leader succeeding in a situation using embedded knowledge--sometimes referred to as "tacit knowledge." [27]-[32] He was operating with understanding and personal insights

that he couldn't fully explain, if asked. While he most likely did not train for that specific scenario, his past experiences, education, and knowledge provided him with the judgment and discretion necessary for effectiveness in the situation [33]. He had developed a sort of professional intuition.

Tacit knowledge has been of interest to the military for at least a decade and is one measure of the ability to learn from experience [33]. One applied product developed from the theories on tacit knowledge was called "Tacit Knowledge for Military Leaders," and consists of a series of scenarios used to assess the level of knowledge attained [34]. "The TKML inventories can be used to help leaders identify areas in which they may need further development and can stimulate their thinking about important leadership issues...alternatively, the inventories can be used to help leaders develop the skills to learn more effectively from their experiences" [34].

By definition, tacit knowledge is personal, it is not readily articulated, and it is not widely shared [29]. It is constructed over time by the individual learner through experience, education, and feedback (among other things). Given this definition, the challenge to enable experienced leaders to pass on their embedded knowledge to inexperienced leaders is daunting, to say the least. According to Nonaka and Takeuchi, "The key to acquiring tacit knowledge is experience. Without some form of shared experience it is extremely difficult for one person to project her –or himself into another individual's thinking process. The mere transfer of knowledge will make little sense, if it is abstracted from associated emotions and specific contexts in which shared experiences are imbedded" [35].

Another way of looking at the problem: Rather than focusing primarily on providing a context where experts are "transferring" their tacit knowledge, instead explore ways to provide a context where novices develop their own tacit knowledge using expert-based experiences as a platform for their learning. This is why situating the Leader Challenge tool within a community of practice is so effective.

PlatoonLeader and *CompanyCommand* are on-line communities of practice for junior Army officers— what the Army calls, "professional forums." These communities combined have more than 10,000 members who are engaged in a vibrant conversation around the effective practice of platoon leadership and company command. The forums' focus is on leader effectiveness, and the members envision every Company Commander and Platoon Leader in the Army engaged in conversation about leading and building effective teams. Situating the Leader Challenge within these communities of practice provides a platform for specific, concrete contexts, in which participants can enter and share experiences with seasoned leaders. This creates a collaborative, social learning environment where participants develop their own embedded knowledge through vicarious experiences based in someone else's context. Given the U.S. Army's dynamic operating environment, there is a need for individual leaders to learn from their own experiences, but there's also just as important a need for the collective to learn from the individuals' experiences.

The research effort covered in this article began in the spring of 2006 as a program "to provide a computer-mediated environment for learning from simulated leadership challenges within the discussion space of Army distributed communities of practice (a.k.a., professional forums)...configured to provide rapid acquisition of actionable knowledge and leadership skills." The tool is called Leader Challenge (or "LC").

V. METHOD

The Leader Challenge is a constructivist simulation derived from personal accounts of leader behaviors in recent critical incidents in Iraq and Afghanistan (drawn from more than 500 interviews). These simulations are constructive in nature to maintain keeping with research that indicates that cognitive processes are constructive and regenerative [36]. As Ulric Neisser, stated, "The central assertion is that seeing, hearing, and remembering are all acts of *reconstruction*" [37]. The constructivist tradition assumes

a developmental progression in ability to learn and adapt. Thus, the sequencing of training and learning events is an important consideration in constructivist learning theory. The research implication is that researchers must consider a series of individual factors such as prior experience, knowledge and cognitive complexity in order to understand how individuals learn and make decisions [38]. This is consistent with Mezirow's aforementioned writings about prior experience informing current experience.

VI. DEVELOPING A LEADER CHALLENGE

The primary basis for the Leader Challenge scenarios comes from grounded research and surveys conducted with leaders in the field. Experienced Army officers on the research team from the Center for Company-level Leaders at West Point drafted a list of experience types common to Soldiers in Iraq, based on their extensive exposure to the field Army, through their administration of the *Platoon Leader* and *CompanyCommand* forums, and through their interviews with young officers. The research team then surveyed 179 junior officers in the field, in order to gain deeper understanding around those experiences that were perceived as most developmental or important to understand. The Center for Company-level Leaders then identified interviewees who were either current platoon leaders or platoon leaders with recent experience. The research team interviewed these protagonists using semi-structured interviews similar to the process used for critical incident interview methodology [39]. The method for gathering the content found in the Leader Challenge modules is consistent with methods established in the original TKML study [34]. Content selected for TKML was (a) based on a personal experience, (b) was not well supported by formal training or doctrine, and (c) expressed some form of action [29]. "The tacit knowledge approach relies on a critical incident technique to identify examples of tacit knowledge acquired in solving real-world problems. That is, we interview domain experts to identify incidents that reflect important lessons and ask them to express in their own words the knowledge gained from those situations" [29]. These real-world, practical problems, "...have multiple 'correct' solutions, each with liabilities as well as assets, and allow for multiple methods of developing a problem solution." [34] The following table provides an abbreviated listing of the first five scenarios in the library of Leader Challenges:

A. Module Creation

A Leader Challenge module consists of the following components: (1) a video vignette in which a leader describes in detail a challenging experience they faced without telling how they addressed it, (2) an accompanying text version of the vignette, (3) images relating to the scenario, (4) a listing of possible courses of action to address the dilemma presented, (5) the protagonist's "rest of the story" in video format, (6) and a library of additional resources consisting of related videos, Army references, recent news stories, or other applicable materials. All of this material is loaded to an FTP (file transfer protocol) site, which the html (hypertext markup language) code references in producing the Challenge. All Leader Challenge components are part of a web-based platform that delivers the content and gives/receives participant feedback through free-text boxes, radio buttons, Likert-type scales, histograms, and multi-media players.

See below an example list of leader challenges scenarios:

Challenge #	Title	Scenario Summary
LC1	Shoot / Don't Shoot	Mounted patrol encounters a parked vehicle and dead body in the road. Patrol observes an individual videotaping from the top of a bus.
LC2	Leading in Combat	Exhausted foot patrol is engaged with an IED. "Higher" directs platoon to clear urban area in search of suspected trigger man. PSG notes the depleted condition of the men.
LC3	Recoil	Soldier killed by sniper. Unit is devastated
LC4	My Platoon Sergeant	PSG declines, personal issues, emotional issues, work issues.
LC5	Adaptation	Locals don't stop for traffic cones at Traffic Control Points.

Table 1: Scenario Summary

B. Expert Evaluation of a Leader Challenge

After a Leader Challenge draft is reviewed and the Challenge prepared for distribution, an expert panel rated the Challenge scenario to allow evaluation of complexity for individual challenges in comparison to each other. Each participant of the panel had more than 10 years of experience in the military and ranged in ranks from Staff Sergeant to Brigadier General.

C. Launching the Leader Challenge

After creating the Leader Challenge modules, rating the relative complexities of the modules, and uploading the content to the web-based *PlatoonLeader* and *CompanyCommand* forums, the research team created a participant database on the back-end of the Leader Challenge platform that would collect individual participant data as each participant progressed through each module. This database also served as the foundation for an e-mail invitation to all participants that provided a personalized/persistent uniform resource locator (PURL) that enabled the database to recognize each participant upon login and write to the appropriate record for data collection. The e-mail campaign marked the launch point of the Leader Challenge experience, where participants were able to complete the modules on-line at a time and place of their own choosing within a two-week period.

VII. THE LEADER CHALLENGE EXPERIENCE

The original cognitive leadership challenge (TKML) sequence presented a brief description of a leadership problem along with a set of 5 to 15 possible options for handling the problem. Participants were to rate each response using a Likert-type scale.

Using the TKML as the basis, early versions of the LeaderChallenge appeared on the *CompanyCommand* forum as early as 2003, providing participants a text-only scenario, a listing of possible options with Likert-type ratings, and an on-line threaded discussion between participants. For example, an early scenario entitled, "Child Dies, Deployment Pending:"

Figure 2: Taking the Leader Challenge

"Just days ago you learned that the only child of one of your NCOs passed away from a long-term illness. This terrible incident has come at a difficult time -- your unit is preparing to deploy to OIF 2 in three months. You are the Company Commander, and you have little experience handling issues of death and bereavement. You face a number of difficult dilemmas. First, naturally, you are concerned about his and the family's well-being. What kind of support team will you create to take care of the family now and while you are deployed? Second, the NCO holds an important position in the company. He is well-respected and a valuable member of your company, and you must make a decision regarding his

deployment status. During a conversation with the NCO, he expresses his dedication to the unit and tells you he wants to deploy. What do you do" [40]?

Based on a Likert-type scale participants would then rate the following options from very bad, to neutral, to extremely good:

(1) Seek the aid of the chaplain to assist with the grieving process.
(2) Assign a casualty assistance officer/NCO from within your unit to assist the family.
(3) Place the NCO on leave for two weeks to take care of his family and grieve.
(4) You and your First Sergeant meet with you Battalion Commander and Command Sergeant Major to identify a potential replacement, regardless of your intentions.
(5) Allow the NCO to deploy. He wants to go and the deployment is still three months away.

After rating each option, the participants would then see the population's aggregate ratings for comparison and then join in an on-line threaded discussion about the scenario within the professional forum. Building from this, the Leader Challenge design concept was expanded to provide for future multi-dimensional assessments of participants. In a Leader Challenge, the participant "experiences" a story through an online multi-media platform, a video vignette, and the participant answers the question, "What Would You Do?" in a provided free-text box, allowing for a creative response. Additionally, upon completion of the challenge the participant is able to interact with fellow practitioners around the scenario and related issues.

The following is an overview of the Leader Challenge experience:

Welcome/Introduction: Participant enters an enclosed space where a dynamic multimedia clip welcomes the participant to the Leader Challenge and provides links to background information about the Leader Challenge concept and how to gain the most from the experience.

Scenario Presentation: The video content conveys the scenario through the voice of the protagonist. Context is provided by appropriate and relevant photographs and text quotes that appear on the screen.

Self-Efficacy Initial Survey (T1): After viewing the scenario, the participant responds to the following three questions reflecting self-efficacy using a Likert-type scale:

   -I feel that I have the necessary information to take action in this type of situation
   -I know what an experienced leader would do in this situation
   -I feel ready to take action in this situation

Written Participant Feedback (T1): The LC requires the participant to type an envisioned course of action in a free-text box, which allows a limited number of characters. In this step, the participant is given the opportunity to create or construct an envisioned course of action and input it as a creative, free-text response, rather than rating a set of provided courses of action. By design, participants provide responses constructed from the situation provided, as well as personal education, training, and experience.

Course of Action Rating (T1): The LC then presents the participant with a set of 3-5 sample courses of action for evaluation. The participant rates the possible choices or responses on a scale based on level of agreement with the each choice using a Likert-type scale (Strongly Disagree, Disagree, Neutral, Agree, or

Strongly Agree).

Population Responses: The LC displays the participant's ratings compared to the aggregate using a histogram, as a mechanism for feedback. The participant will also view the free-text responses of other participants. These responses are anonymous but allow the participant to read what other participants provided as potential solutions to the problem. The participant can rate each response as "helpful" or "not helpful," and can also post a comment to any response.

Additional Learning: Before moving to the final step, the participant views additional resources that offer broadening and more in-depth perspectives on the scenario. This gives the participant the ability to extend learning outside of the LC by examining resources such as relevant Army Field Manuals, news articles, video clips, and interviews with other protagonists. Finally, the participant views a video of the protagonist sharing "the rest of the story"--or what they actually chose to do in the situation described in the initial scenario presentation.

Edit Final Answers (T2): The participant can make changes to the initial free-text answer and course of action selections. This is a significant step and one that enables the participant to assess their own learning as a result of the experience. In the process of changing their text response to how they would handle the situation they are reflecting and integrating what they have learned in the LC experience.

Self-Efficacy Exit Survey (T2): The participant responds to three questions reflecting self-efficacy using a Likert-type scale. These are the same questions as presented in the Self-Awareness Initial Survey at T1 (this step allows for comparison of responses as a measure of self efficacy pre and post each leader challenge experience):

-I feel that I have the necessary information to take action in this type of situation

-I know what an experienced leader would do in this situation

-I feel ready to take action in this situation

Conversation: The participant is then able to participate in a facilitated on-line threaded discussion with their peers and experiences leaders.

Classroom Facilitation (T3): If feasible, participants meet in a small-group classroom environment, where they watch the LC scenario again, engage in a facilitated face-to-face discussion, and have the opportunity to edit their free-text responses again.

D. Participant Responses

Participants in this Leader Challenge study to date number more than 3200. The first test went to the entire Class of 2008 at the United States Military Academy at West Point when they were seniors. The second and third tests utilized one randomly selected company of cadets at West Point (group of 34 cadets). Subsequent data collection and tests have included the entire West Point classes of 2009 and 2010, as well as various pilot programs and other experiments at several ROTC programs at as well as the Basic Officer Leader Course at Fort Benning, Georgia.

As one measure of learning, the expert panel evaluated the quality of each participant's text responses at

both T1 and T2 according to measures of differentiation and integration. Differentiation was measured by confirming the presence of diverse themes in each participant's Leader Challenge response. Integration was measured by rating each participant's ability to integrate those concepts in their text responses in a manner that displays overall awareness, professional conduct, and tactical/operational/strategic maturity. The measures of differentiation and integration were combined to create an overall quality score for each participant's response.

VIII. RESULTS

Throughout the Army, West Point, ROTC programs, and with non-military organizations, feedback with regard to the LC program is encouraging. Endorsements from senior to junior leaders are consistently positive, "This works. How do I get more of these Challenges?" Furthermore, participant feedback on the LC supports the following conclusions: 1) Participants are learning. We define this learning by stating that some degree of change is occurring in the participant as a direct result of the LC experience; and 2) Participant level of self efficacy increases as a result of the LC experience.

A. Learning

The first step in the Leader Challenge requires the participant to type an envisioned course of action in a creative response free-text box (T1) and later in the LC experience the participant has the opportunity to change their initial text response based on new insights and understanding garnered as they went through the LC.

During the "Edit Final Answer" step of the Leader Challenge (T2), participants can make modifications to their initial free-text responses. These modifications could be considered corrections or improvements, or even the result of internal reflection—and depict learning that occurred during the experience. As a whole, nearly 40% of all participants made a change to their text answers during the Leader Challenge (See Table 2 below).

Leader Challenge Text Responses from LCs 1-5	% of Changed Answers from T1 to T2	% of Text Changed (based on characters)
	39%	19%

Table 2: Participants' Response Changes

Table 3 below summarizes the quality scores of the novice participants, each representing a different and unique Leader Challenge situation. In this regard, participant quality scores increased from T1 to T2, reflecting learning that is occurring in the LC experience.

Quality Scores Comparing the participants who changed their text answers	LC1	LC2	LC3	LC4	LC5
Pre-Score (T1)	5.5	5.7	6.8	6.8	4.5
Post-Score (T2)	7.0	7.0	6.9	6.9	4.8

Table 3: Quality Improvement of Participants

B. Self-Efficacy

Self-efficacy has been defined as one's belief in one's ability to succeed in specific situations [41].

Bandura states that, "It is one thing to possess self-regulatory skills but another to stick with them in the face of compelling inducements to behave otherwise. A strong sense of self-regulatory efficacy provides the necessary restraining power" [42]. The concept of self-efficacy plays an important role in individual performance and thus makes a significant contribution to effectively leading in combat. From a leader education and development perspective, it is something that we would want to see increase in our developing leaders as they prepare for leading in combat. Additionally, social cognitive theory describes that one way to increase self-efficacy is through observations of others that we can identify with [42],[43]. The Leader Challenge provides a platform for participants to observe others' behaviors in a simulated environment. Furthermore, Leader Challenge participants' behaviors are not imitations of the protagonists, as initial tests to control for imitation indicate that while participants learn through observing, they do not mimic in their responses the actions of the protagonists.

Participant self-efficacy was measured by a self-report survey administered at two points. It was first measured after subjects had been exposed to the initial scenario (T1). The survey was administered a second time after subjects had completed the entire simulation (T2), and was measured on a 5 point Likert type scale ranging from strongly disagree to strongly agree, with a midpoint of neutral. Self-efficacy was measured using a three item scale which consisted of the questions outlined in the METHODS section: 1) I feel that I have the necessary information to take action, 2) I know what an expert would do in this situation, and 3) I feel ready to take action in this situation. This test was measured at T1 and T2 (pre-challenge and post-challenge).

Participants showed an average individual T1-T2 increase of 32% in "having enough information to act" in the scenario, an average individual T1-T2 increase of 44% in "knowing what an expert would do" in the scenario, and an average individual T1-T2 increase of 12% in being "ready to act" in the scenario provided. See the summary of these results in Table 4 below.

Self-Efficacy: Participants reporting on their levels of readiness at the start of a Challenge and after completing a Challenge	I feel that I have the necessary information to take action in this situation.	I know what an experienced leader would do in this situation.	I feel ready to take action in this situation.
Average percent increase in personal readiness (by indiv)	32%	44%	12%
% of participants feeling more ready (as a group)	46%	61%	47%
% of participants realizing that they understood less	6%	7%	0%

Table 4: Self-Efficacy Results

In considering the tested population as a whole, 46% of the participants had some increase from T1 to T2 in "having enough information to act"--an indication of an increase in confidence. More than 60% of the participants had an increase in "knowing what an expert would do" in the situation, and 47% had an increase in being "ready to act" in the scenario provided.

Of note, some participants decreased in their confidence from T1 to T2, with 6% decreasing in "having enough information to act" and 7% decreasing in "knowing what an expert would do" in the situation. Although these participants felt less ready after experiencing the Leader Challenge, their awareness of

their own perceived readiness level was demonstrated.

Participant qualitative feedback reinforces the above themes of participant learning and increase in self-efficacy. Consider the following:

"I know, for me, for the first time in four years here...this [Leader Challenge] removes the mystery [of the experience of leading in combat that I am preparing for]."

"The discussion has helped me the most because it has allowed me to think through scenarios and get positive feedback/confidence."

"I feel like I'm much more prepared to lead a platoon. Dealing with a PSG (Platoon Sergeant) is vital to being on PL (Platoon Leader), and I feel like I have learned a lot about it. This is the next best thing to actually experiencing it."

"This is for sure the most developmental experience I've had in four years here [at the Academy]."

"It seems that one of the most important take-aways for me is an increased self-awareness with every Leader Challenge. I find out more about myself...I learn more about myself based on how I react to different ideas and how ideas/thoughts sink in and sprout in my mind."

"My analyzation of complex problems has changed over the weeks. Understanding problems is the foundation of solving problems. This Leader Challenge has put a lot in perspective as far as different situations from best case to worst case scenarios."

"Now, more-so than two weeks ago, I am able to think outside of the "structure" than we typically do. Instead of trying to figure out what the "right" answer is, I am comfortable in finding what "my" answer is."

IX. CONCLUSIONS

The Leader Challenge platform and methodology is an effective means of distributed education and passing on experiences in the military context—a context that involves a highly dynamic and complex milieu, and a large, globally distributed workforce. The tool works well for self-development, as a classroom augmentation, or in a virtual environment under the care of an experienced online facilitator/educator.

The data supports these claims of effectiveness: that Soldiers and Leaders are learning and are increasing in self-efficacy as a result of their experience with the Leader Challenge The research and learning from the U.S. Army Leader Challenge program is currently being tested as a leader development and experiential learning solution for other organizations such as police force, medical teams, universities, consulting groups, not-for-profits, military organizations, and businesses. These concepts and programs promote the same value proposition as the original Leader Challenge program– to encourage the development of tacit knowledge by creating an environment to explore the lived experiences of others.

Recommendations for future research and development lie in the blending of the Leader Challenge methodology with virtual game engines where specific branches and sequels can be explored. Further testing is warranted to determine the effective transfer from the Leader Challenge environment to the real

world. The Army's training areas provide a good test field for this research. The most compelling evidence of Leader Challenge effectiveness will be found in a substantiated longitudinal study of participants and their performance over time. Such a study could demonstrate accelerated learning cycle, residual lessons learned, automaticity, and development in contexts of increasing complexity.

The Leader Challenge research continues to explore how to develop content in varying degrees of complexity, how to rate each participant's interaction with the tool, how to create sequences of scenarios that will provide participants a development path from simple situations to increasingly complex situations, and how to evaluate their overall development as leaders. As Sternberg and colleagues state, "The development of tacit knowledge inventories readily may be understood as a production process, beginning with the raw materials of experience-based tacit knowledge elicited from successful practitioners in a given domain and culminating in a revised and validated inventory" [29]. Others methods for evaluating the Challenges could include topical inventories, moral/ethical inventories, types of knowledge, or any organizing framework applicable to the domain of interest. Many leader development programs build around an inventory of desired skills or competencies. The Leader Challenge, however, presents a shift from a competency-based leader development curriculum— to more of an experience-based approach. This approach seeks to identify key experiences that leaders will very likely have and thus need to be prepared for developmentally. Then the learning intervention is developed around preparation for effectiveness in that experience.

For example, based on interviews with junior officers in combat, it is highly probable that a young officer will have to make a call to "Shoot or Not to Shoot" at some point in a deployment, as depicted in the situation mentioned in the introduction to this paper. And it is likely that the situation will not be clear. So, while exact context is impossible to predict, the Leader Challenge can help participants prepare for specific experience types by exposing them to the lived experience of those who have already led through the situations they're likely to face.

X. ABOUT THE AUTHORS

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XI. REFERENCES

1. **Leader Challenge #1**, "Shoot/Don't Shoot," published in the PlatoonLeader forum at https://milspace.army.mil.
2. **Reider, Colonel Bruce J.,** "Executive Summary," 25 November, 2008, of Leader Development Summit, hosted by Brigadier General Edward Cardon, at Fort Leavenworth, Kansas, 19-20 November, 2008. http://usacac.army.mil/cac2/cal/repository/LDESummit/EXSUM.pdf.
3. **Cavallaro, Gina.** TRADOC Chief: Leader Development Needs Work. *ArmyTimes,* (February 2009) http://www.armytimes.com/news/2009/02/army_dempsey_022809w/.
4. **Kolb, D.**, Experiential Learning: Experience as the Source of Learning and Development. Englewood Cliffs, NJ: Prentice-Hall. 1984.
5. **Zemke, R.,** The Honeywell Studies: How Managers Learn to Manage. Training, 22(8), 46-51, 1985.
6. **Conger, J. A.**, Learning to Lead: The Art of Transforming Mangers into Leaders. San Francisco: Jossey-Bass, 1992.
7. **Kotter, J. P.**, What Leaders Really Do. *Harvard Business Review*, 68(3), 103- 111, 1990.
8. **Kouzes, J., & Posner, B.**, The Leadership Challenge. San Francisco: Jossey- Bass, 1990.
9. **McCall, M. W., Jr, Lombardo, M. M., & Morrison, A. M.**, The Lessons of Experience. New York: Lexington Books, 1988.
10. **McCall, M. W., Jr.**, High Flyers: Developing the Next Generation of Leaders. Boston: Harvard Business School Press, 1998.
11. **Bennis, W. G., & Nanus, B.**, Leadership: The Strategies for Taking Charge. New York: Harper & Row, 1985.
12. **Gibson, S.,** A New Army Leader Development Strategy Released – "A Leader Development Strategy for a 21st Century Army", November 2009, http://www.army.mil/-news/2009/12/09/31552-new-army-leader-development-strategy-released/.
13. **Dempsey, M.** "Army Learning Concept for 2015: Thinking Soldiers – Learning Army", 09 March 2010, http://tradoclive.dodlive.mil/2010/03/09/army-learning-concept-for-2015thinking-soldiers-%E2%80%93-learning-army/.
14. **Dempsey, M.** "Untitled Article," unpublished, Army Magazine, February 2011.
15. **Allen, N. & Burgess, T.**, *Taking the Guidon: Exceptional Leadership at the Company Level*. DE: Center for Company-Level Leadership, 2001.
16. **Knowles, M. S.**, *Self-Directed Learning*. Association Press: New York. Knowles, M. S. (1980). *The Modern Practice of Adult Education: From Pedagogy to Andragogy.* Englewood Cliffs, NJ: Prentice Hall, 1975.
17. **Mezirow, J.**, *Transformative Dimensions of Adult Learning*. San Francisco: Jossey-Bass, 1991.
18. **Mezirow, J.**, Understanding Transformation Theory. *Adult Education Quarterly,* 44: 222-232 (1994).
19. **Kolb, D., & Fry, R.**, Toward and Applied Theory of Experiential Learning. In C. Cooper (Ed.), **Theories of Group Processes** (pp. 33-57). London: John Wiley, 1975.
20. **Schon, D. A.**, *Educating the Reflective Practitioner.* San Francisco: Jossey-Bass, 1987.

21. **Boud, D., & Walker, D.**, Introduction: Understanding Learning From Experience. Boud, D. Cohen, R.; and Walker, D., eds. Using Experience for Learning. Buckingham, England: Society for Research into Higher Education and Open Learning Press, 1993.

22. **Kouzes, J., & Posner, B.**, *The Leadership Challenge*. San Francisco: Jossey- Bass, 1990.

23. **McCall, M. W., Jr.**, *High Flyers: Developing the Next Generation ofLeaders*. Boston: Harvard Business School Press, 1998.

24. **McCauley, C. D., Moxley R. S., & Van Velsor, E. (Eds.),** *The Center for Creative Leadership Handbook of Leadership Development*. San Francisco: Jossey-Bass, 2004.

25. **Polanyi, M.**, *The Tacit Dimension*, New York: Anchor Books, 1967.

26. **Baum, D.**, Battle Lessons: *What the Generals Don't Know*, The New Yorker, 2005. http://www.newyorker.com/archive/2005/01/17/050117fa_fact#ixzz18gjKNIBs.

27. **Sternberg, R. J.**, The triarchic mind: *A new theory of human intelligence*. New York: Penguin Books, 1988.

28. **Sternberg, R. J.**, Successful intelligence. New York: Plume, 1997.

29. **Sternberg, R. J., Forsythe, G. B., Hedlund, J., Horvath, J. A., Wagner, R. K., Williams, W. M., Snook, S. A., Grigorenko, E.**. *Practical Intelligence in Everyday Life*. Boston, MA: Cambridge University Press, 2000.

30. **Sternberg, R. J., & Horvath, J. A.** (Eds.), *Tacit knowledge in professional practice.* Mahwah, NJ: Lawrence Erlbaum Associates, 1999.

31. **Sternberg, R. J., Wagner, R. K., Williams, W. M., & Horvath, J. A.,** Testing common sense. American Psychologist, 50: 912-927, 1995.

32. **Sternberg, R. J., & Wagner, R. K.** (Eds.)., Practical intelligence: *Nature and origins of competence in the everyday world*. New York: Cambridge University Press, 1986.

33. **Hedlund, J., Antonakis, J., Sternberg, R.J.** Tacit Knowledge and Practical Intelligence: Understanding the Lessons of Experience. US Army Research Institute for the Behavioral and Social Sciences, (2002).

34. **Hedlund, J., Forsythe, G.B., Horvath, J.A., Williams, W.W., Snook, S., Sternberg, R.J**. Identifying and Assessing Tacit Knowledge: Understanding the Practical Intelligence of Military Leaders. *The Leadership Quarterly* (2003).

35. **Nonaka, I., Takeuchi, H.**, *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, 63, 1995.

36. **Fletcher, J.D.** Cognitive Readiness: Preparing for the Unexpected (IDA Paper D-3061). Alexandria, VA: Institute for Defense Analyses, 2004.

37. **Neisser, U**. *Cognitive psychology.* New York, NY: Appleton, Century, Crofts, 1967.

38. **Kegan, R**. *In over our heads*. Cambridge, MA: Harvard University Press, 1994.

39. **Flanagan, J. C.**, The Critical Incident Technique. *Psychological Bulletin*, 51(4), 327-358, 1954.

40. **Dixon, N., Allen, N., Burgess, T., Kilner, P. & Schweitzer, S.**. Company Command: Unleashing the Power of the Army Profession. West Point, NY: Center for the Advancement of Leader Development and Organizational Learning, 2005.

41. **Bandura, A.,** Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215, (1977).

42. **Bandura, A.,** Social cognitive theory in cultural context. Journal of Applied Psychology: An International Review, 51, 269-290, (2002).

43. **Bandura, A., Ross, D., & Ross, S.A.**, Transmission of aggressions through imitation of aggressive models. Journal of Abnormal and Social Psychology, 63, 575–582, (1961).