Increasing Cognitive Readiness in Joint Command Battle Staffs

Jacob D. Biever
Northrop Grumman
Suffolk, VA
jacob.d.biever.ctr@mail.mil

Emilie A. Reitz
Leidos
Norfolk, VA
emilie.a.reitz.ctr@mail.mil

ABSTRACT

This paper builds on the three year research and development project for Joint Continuum of eLearning (Fautua et al, 2014) and discusses the Joint Staff J-7's (Joint Training) initial effort last year to develop measures and assessments of cognitive performance among cross-functional staffs and planning teams in Joint Force Commands (Reist et al, 2016).

We will first review the initial results that indicated (but not conclusively) staffs and teams increased cognitive readiness using the joint blended learning training methodology; namely, by integrating online courses (and metrics) to achieve a declarative learning baseline; tailoring classroom discussion to address identified knowledge gaps based on the embedded course metrics; and small group scenario-based problem sets that stressed the staffs/planning teams to perform under calibrated duress. The most important aspect of this approach was the addition of a facilitated/guided after action review/reflection on the team's cognitive performance (i.e. review of the staff's ability to frame the problem and demonstrate specific aspects of higher order skills, like critical thinking, problem solving, anticipation, agility, and adaptiveness.). The challenge remains to create a valid, reliable collection tool that, while adapting existing theories and frameworks of problem-solving process and social dynamics that affect performance and group cognition, is accessible to trainers. We will discuss how to arm trainers with the theories, frameworks, and collection tools necessary to evaluate a training audience from a cognitive perspective and collecting data using the TEIR concept. TEIR stands for triggering, exploration, integration, and resolution, and the associated framework provides insights into group performance. Finally, we will discuss the process of decoding speech, analyzing data, and drawing conclusions from seven small group training events, which shows promise for helping staffs gain higher-order knowledge, skills and abilities like anticipation, problem solving, and adaptiveness.

ABOUT THE AUTHORS

Jacob D. Biever, M.P.A., is an analyst at Northrop Grumman Corporation and supports the Individual Training and Learning Branch of Joint Staff J-7, Deputy Director for Joint Force Development. He previously served in the U.S. Army Training and Doctrine Command as a planner for human and organizational behavior and as analyst in U.S. Joint Forces Command.

Emilie A. Reitz, M.A., is a Research Analyst at Leidos, currently supporting the Combined Fire Support Interoperability Division of Joint Staff J6, Deputy Director for C4 and Cyber Integration. In this capacity, she is the data collection and analytical working group lead for Bold Quest, a Joint Staff Coalition Capability Demonstration and Assessment.

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INTRODUCTION

A headquarters staff assembles for a three-day joint training exercise. The staff are members of a tactical headquarters, who could someday find themselves deploying as a joint task force (JTF) headquarters; they have not yet had any opportunities to plan an operational level event. Few have ever served in a JTF headquarters, and just as few have received education about the operational level of warfare. This opportunity to train and learn was preceded by ten hours of online training that introduced them to the baseline information they need to operate at the operational level. A tailored Mobile Training Team (MTT) from the Joint Staff J7-Training and a member of the U.S. Agency for International Development (USAID) introduce themselves, and begin presentations about operational level topics the staff needs to know for the hands-on training. This training is targeted to fill specific knowledge gaps of the training audience, determined from the online course metrics, and reinforced with case studies. Then they move to a software based training event, which provides a complex realistic series of operational-level tasks in support of a humanitarian relief scenario. At first, the headquarters staff grapple with the challenges of interacting with host nations and interagency support groups, as well as struggle to succeed at the mission. A break is called, and the MTT facilitates the staff through a reflection discussion on their performance. The staff continues the process of problem-solving, task completion under time constraints, and facilitated reflection. After three days of mission performance in the virtual environment, the headquarters staff not only gains a better grounding of the joint doctrinal planning processes required to support a complex foreign humanitarian assistance mission, but it is also better at *framing* the primary problems to resolve, better at learning *how* to understand the operational environment (i.e. cultural, religious and social nuances) and thus better able to *anticipate* and resolve challenges beforehand. In short, the battle staff is more ready to perform as a JTF headquarters from a doctrinal and cognitive perspective.

This is the goal of the Blended Learning Training System (BLTS), a Joint Staff J7-Training process for addressing training gaps (Fautua, Schatz, et al, 2014). This paper will discuss BLTS from the perspective of the trainers who support these training interventions, as well as the theories, frameworks, and collection tools necessary to evaluate a training audience from a cognitive perspective. This discussion will be supported by three case studies where the techniques were applied, and discussion of their outcomes. Finally, we will discuss the lessons learned during an iterative development process of leveraging the MTT as data collectors to help staffs gain higher-order knowledge, skills and abilities like anticipation, problem solving, and adaptiveness.

BLENDED LEARNING IN JOINT TRAINING

In 2011, the Joint Staff J-7 initiated a Continuum of *e*Learning to close five training gaps (explained in detail in Fautua, Schatz, Reitz, & Killilea, 2012):

(1) Untrained staff: Up to 40% of staff members missed training events due to scheduling or other reasons.
(2) Stove piped training and education: Training opportunities within an exercise often lacked integration with the rest of a service members' past performance.
(3) Service-specific mindsets: Some personnel lacked the specific knowledge and mindset to plan and conduct joint operations.
(4) Insufficient data: A lack of targeted, objective assessment of personnel's incoming subject-matter knowledge.
(5) Retention: Staff members' knowledge potentially decayed between the annual (or longer) training events

The Continuum of *e*Learning project addressed these gaps, and over the course of three years (2011-2014) was integrated into the Joint Training Systems through the Joint Event Life Cycle process (US Joint Staff, 2015). The

project was matured into the Blended Learning Training System (BLTS), which integrates online, classroom, and hands-on training. Since then, two more training gaps have been identified and are being addressed by the BLTS:

(6) Untrained small staffs: Large collective exercises have proven to be insufficient training venues for various cross-functional staff planning teams and groups collectively known as boards/ bureaus, centers/ cells, and working groups, or "B2C2WG" (Bohnemann, 2014). Typically, these planning teams rarely do any pre-exercise training as a group, meeting for the first time only during a large collective exercise, operate at a rapid pace, and have few opportunities to correct deficiencies mid-stream.

(7) Collective cognitive performance assessment: joint force headquarters require battle staffs that can "accurately assess and evaluate multi-layered, complex problems, and then produce nuanced, reasoned, and strategically minded recommendations," and there are currently insufficient means built into the training cycle to measure these attributes (Reist, Fautua, Reitz, Schatz, & Stodd 2016; Ruth, Riecken, & Burland, 2015).

Joint training resources employed during a BLTS event are Joint Knowledge Online (JKO) courses, a Joint Staff J7-Training MTT, and the Small Group Scenario Trainer (SGST). While the BLTS can support up to a 3-star level JTF HQ, the current focus is on B2C2WG and small staffs such as joint operations centers (JOC), operational planning teams (OPTs), air operations centers (AOC), and smaller working groups like information operations, cyber and targeting as we explore the two additional training gaps described above. Three features of BLTS that contribute to closing these gaps are (1) the use of metrics to integrate online, classroom, and hands-on training, (2) a focus on cognitive performance to elevate staffs' ability to think at a higher level (Bloom, 1956), and (3) analysis of group dynamics to improve staffs' organizational performance (Reist, Fautua, Reitz, Schatz, & Stodd 2016).

Online training, the first component of BLTS, is completed ideally 6 weeks prior to hands-on training and emphasizes fundamental (declarative) knowledge. It typically consists of 3 to 6 JKO courses selected by training audience leaders and requires about 8-10 hours for each individual to complete. A common approach is 2-4 courses for the entire training audience, and 1-2 courses for personnel in selected functional areas. For instance, a logistician may complete courses in (1) *Joint Operation Planning*, (2) *Design and Planning* and (3) *Joint Command, Control, and Communication* to reinforce their general joint competencies and common language, and *Joint Sustainment* to provide recent best practices from across the joint community to enhance his or her functional area.

Classroom training (academics) is the second component and provided by the MTT. In-resident academics are informed and tailored by the online course results (metrics reports), which is designed to help baseline the knowledge level of the training audience as well as identify specific weakness to address during in-residence academics. The MTT uses a dialogue and discussion format to give in-depth knowledge; these presentations take about 8-10 hours. Topics and depth depend on the direction of training audience leadership, training objectives as set by unit leadership, and performance during online training. Discussion is always the preferred training method, but MTT presenters lecture as necessary in cases where the training audience has very little previous knowledge. The last academics event is a relatively free flowing discussion panel designed to integrate the different topic areas and show the training audience how operational level thought fits together. Together, online courses and academics combine to set the conditions for the training audience to rapidly improve procedurally and advance cognitively during the exercise.

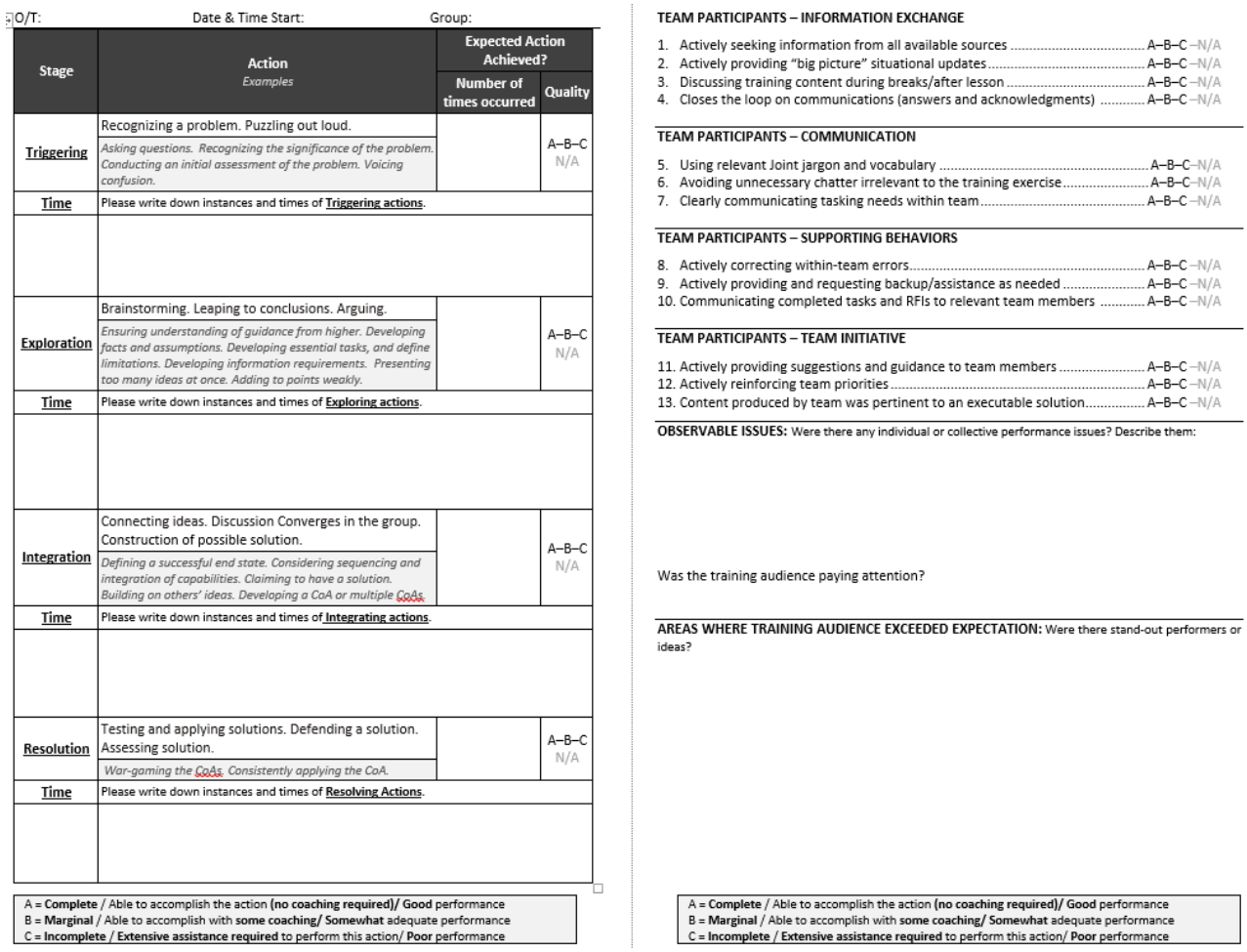
The scale of the last stages of the BLTS ranges from a SGST event to a large collective exercise. Large collective exercises involve hundreds of participants and focus on 4-star combatant command (CCMD) or 2/3-star JTF HQ level questions and training objectives. They typically include large-scale modeling and simulation and external partners. At the other end of the scale is an SGST event, which focuses on supporting small staffs and cross-functional planning teams with limited/specific training objectives, and few external partners. The SGST is a web-based application that presents a semi-immersive mission scenario that can be synchronously distributed globally, real-time communications, and file-sharing capability. SGST also hosts chats, supports planning, shares planning documents, and captures participant inputs for later reference and after-action review and reflection.

DATA COLLECTION CONCEPTS

As outlined above, the BLTS uses a number of techniques to collect the three types of data that are used to enhance the training from individual to collective levels: 1) Individual performance metrics; 2) small group cognitive

performance metrics; and 3) and intra-group social dynamics metrics. The most recent addition is the Cognitive Performance Research and Observation (CPRO) form used for collecting data during the execution of SGSTs and large-scale exercises. CPRO was designed to be easy to use for data collectors who do not have a formal background in research psychology. The CPRO form is organized from top to bottom; each section includes guidance to help with identifying speech, a place to put ticks for each instance that the data collector hears a triggering, exploration, integration, or resolution comment, a space for time when the data collector believes the group has moved from one stage to the next, and finally a space for examples of speech.

The right side is for intra-group social dynamics and designed to be completed at the end of a problem solving event (Figure 1). The top section includes thirteen behaviors associated with group effectiveness and divided into four categories: information exchange, communication, supporting behaviors, and team initiative. For each behavior, the data collector rates each as good, adequate, poor or not applicable. The next two sections provide space for amplifying statements.



O/T: Date & Time Start: Group:

Stage	Action *Examples*	Expected Action Achieved? Number of times occurred	Quality
Triggering	Recognizing a problem. Puzzling out loud. *Asking questions. Recognizing the significance of the problem. Conducting an initial assessment of the problem. Voicing confusion.*		A–B–C N/A
Time	Please write down instances and times of **Triggering actions**.		
Exploration	Brainstorming. Leaping to conclusions. Arguing. *Ensuring understanding of guidance from higher. Developing facts and assumptions. Developing essential tasks, and define limitations. Developing information requirements. Presenting too many ideas at once. Adding to points weakly.*		A–B–C N/A
Time	Please write down instances and times of **Exploring actions**.		
Integration	Connecting ideas. Discussion Converges in the group. Construction of possible solution. *Defining a successful end state. Considering sequencing and integration of capabilities. Claiming to have a solution. Building on others' ideas. Developing a CoA or multiple CoAs.*		A–B–C N/A
Time	Please write down instances and times of **Integrating actions**.		
Resolution	Testing and applying solutions. Defending a solution. Assessing solution. *War-gaming the CoAs. Consistently applying the CoA.*		A–B–C N/A
Time	Please write down instances and times of **Resolving Actions**.		

A = **Complete** / Able to accomplish the action **(no coaching required)/ Good** performance
B = **Marginal** / Able to accomplish with **some coaching/ Somewhat** adequate performance
C = **Incomplete** / **Extensive assistance required** to perform this action/ **Poor** performance

TEAM PARTICIPANTS – INFORMATION EXCHANGE

1. Actively seeking information from all available sources ..... A–B–C –N/A
2. Actively providing "big picture" situational updates ..... A–B–C –N/A
3. Discussing training content during breaks/after lesson ..... A–B–C –N/A
4. Closes the loop on communications (answers and acknowledgments) ..... A–B–C –N/A

TEAM PARTICIPANTS – COMMUNICATION

5. Using relevant Joint jargon and vocabulary ..... A–B–C –N/A
6. Avoiding unnecessary chatter irrelevant to the training exercise ..... A–B–C –N/A
7. Clearly communicating tasking needs within team ..... A–B–C –N/A

TEAM PARTICIPANTS – SUPPORTING BEHAVIORS

8. Actively correcting within-team errors ..... A–B–C –N/A
9. Actively providing and requesting backup/assistance as needed ..... A–B–C –N/A
10. Communicating completed tasks and RFIs to relevant team members ..... A–B–C –N/A

TEAM PARTICIPANTS – TEAM INITIATIVE

11. Actively providing suggestions and guidance to team members ..... A–B–C –N/A
12. Actively reinforcing team priorities ..... A–B–C –N/A
13. Content produced by team was pertinent to an executable solution ..... A–B–C –N/A

OBSERVABLE ISSUES: Were there any individual or collective performance issues? Describe them:

Was the training audience paying attention?

AREAS WHERE TRAINING AUDIENCE EXCEEDED EXPECTATION: Were there stand-out performers or ideas?

A = **Complete** / Able to accomplish the action **(no coaching required)/ Good** performance
B = **Marginal** / Able to accomplish with **some coaching/ Somewhat** adequate performance
C = **Incomplete** / **Extensive assistance required** to perform this action/ **Poor** performance

Figure 1. Version 5 of the Cognitive Performance Research and Observation (CPRO) Form

TEIR methodology

The TEIR methodology uses speech coding to track a group's progress through the problem solving process and provides insight into why it is or is not progressing (Garrison et al., 2001). While the methodology outlined by Garrison et. al, was originally for interpreting threaded online message discussions, it has been modified and innovated by the Joint Staff J7 trainers to support an environment that included mixed use by participants of chat data and face-to-face discussions. In the new training context, the intent is to observe and assess a broader, more dynamic intra-group exchange of either in-person and online communications rather than simply following an online threaded dialogue.

The CPRO methodology codes language into four categories: Triggering, Exploration, Integration, and Resolution. Triggering comments offer background information and culminate into probing questions where group members understand enough of the problem to frame it. Exploration comments reflect preliminary thinking, sometimes without much evidence, and establishes facts and assumptions. Integration comments demonstrate movement toward consensus, with comments building upon one another and melding ideas into a solution. Resolution comments are well-argued positions or persuasive courses of actions. In use during an event, MTT members and data collectors listen to a group's discussions, listening for comments that fall into one of the categories. When they hear one, they place a tick in that section. They also have the option of writing any given comment on the CPRO form as an illustration. Quoting comments helps analysts to establish context and check interrater reliability downstream.

The ticks add up to a profile that indicates how much effort the group spent within each TEIR category. While there is no standard for an ideal profile in a military setting, a group should move through each of the categories with enough time remaining to adequately integrate their solution, wargame it, and reach consensus. For instance, a problem may be purposefully poorly defined and force the group to spend more time triggering. Another group may be solving a problem that requires working through large quantities of information before developing a solution, which forces more time in the exploration stage. The idea is to place the staff under some problem-solving stress, like discerning meaning from abstract or conflicting operational data. The data collector or the analyst must understand the problem and associated topics well enough to know whether the group's activities as documented on the CPRO form are necessary or indicators of a problem (Borg, & Gall, 1989).

The profile may also illustrate group weaknesses. A group may not have the procedural knowledge they need to understand and analyze the problem, which causes them to spin around in the triggering and exploration stage. There might also be differing priorities among members that stalls exploration and prevents integration. A larger group may not have the internal processes needed to conduct problem solving. A common instance among military planning groups is the presence of a strong leader, cooperative group members and well defined problem solving processes, but the group is asked to solve a problem for which its members do not have the needed knowledge or experience to solve. In this last case, they often efficiently generate a non-useful solution. In all of these cases, TEIR is a useful framework to help document and then explain what happened (figure 2).

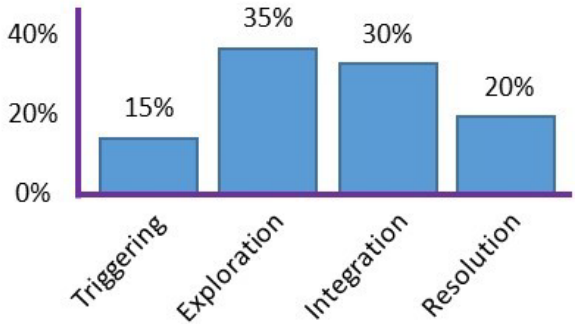


Figure 2. An Example TEIR Profile.

Group Social Dynamics

The group social dynamics section helped define how well a group works together. Together, they measure formal and informal leader and member behaviors. There are four attributes for Information Exchange that center on seeking and sharing information. Communication centers how clearly the group articulates tasks and ideas and stays "on topic." Supporting Behaviors center on how well they work together, and Team Initiative measures the group's collective desire to succeed.

Measurement of group social dynamics have been useful because leaders among the five groups evaluated to date have been interested in how they can improve management of their respective groups. The BLTS is a non-threatening environment for the training audience, and they perceive that the MTT's observer/ trainers (O/Ts) are well qualified. When an O/T sees a weakness in the group, he or she can easily use the thirteen attributes in the group dynamics section to pinpoint the weakness, start a conversation, and recommend a correction as soon as the next break. An example might be pointing out the importance of "actively reinforcing team priorities." Another is using several of the attributes to illustrate the importance of encouraging participation among junior members of the group. These interventions lead to simple fixes that leaders value and immediately embrace.

Compression and Reflection

Compression occurs when a group is presented with a problem that they understand is within their competency band but have great difficulty with generating a useful solution (Kaempf, Klein, Thordsen, & Wolf, 1996). To create compression in a BLTS, the scenario presents a difficult problem with tough choices and limited time to solve it. An example might be a complicated targeting problem with equally competitive solutions from both lethal and non-lethal actions but whose success depends greatly on the timing and tempo of political/diplomatic considerations that stem from vague guidance and unknowable strategic implications.

When groups struggle with such tasks or when they reached the point of diminishing training returns, the group leader, on the advice of the MTT, can pause the exercise and allow the MTT to facilitate an in-stride reflection exchange. Again, the aim is not on producing a "right answer" but rather on the group's critical thinking, framing and/or problem-solving considerations. In a well-structured training environment, they examine, uncover, and analyze their assumptions for accuracy; consider different perspectives; agree upon and take corrective actions to improve themselves (Meyer, 2003). The outcome is accelerated cognitive growth as the group deliberately begins work to improve their self-awareness which, in turn, supports self-correcting and self-regulating decision-making skills (Reist, Fautua, Reitz, et al., I/ITSEC, 2016). Observations among O/Ts in over a decade of designing training environments to resolve operational gaps and strategic weaknesses in planning and staff actions, the most prevalent measure of joint expertise has come down to decision-making, particularly decision-making under stress. Using the "crawl, walk, run" metaphor, compression in a structured event supported by expert trainers immediately places the training audience in a position where they must "run," and reflection is the process of figuring out how to quickly move from a "crawl" or "walk" to a "run."

APPLICATION OF THE BLTS ASSESSMENTS

The Joint Staff J7 collects and analyzes metrics that are integrated into each stage of the BLTS to optimize training time, enhance learning and provide continuous data for feedback (Table 1). Assessments begin with online courses; demographics, participation, and pre- and post-test scores are automatically collected through the Learning Management System. The demographics provide an indication of experience with operational level topics. Participation looks at how many personnel took courses, and how many they completed. This knowledge indicates the minimum number of personnel in the training audience who will possess the knowledge of fundamentals when the O/Ts arrive. It also provides insight into senior leader participation (O5 and O6). If leaders take the time to complete the courses, O/Ts will expect leader participation that enables more informed discussions, and a more focused training audience. If not, O/Ts will prepare for lower levels of discussion that might cause the training audience to be more distracted by their "day jobs." The pre-test and post-test aggregated averages provide an indication of what the training audience knew before taking the courses and how much they improved. Pre-test scores serve as the baseline. Post-test scores are important, as large improvements tend to erode quickly and require reinforcement during academics.

Table 1. Data collection Scheme during execution of the BLTS.

Data	Data Collector(s)	Before/During Exercise
JKO Online Courses	**Metrics Analyst**	**Before**
Processes & Procedures	**Observer/Trainers**	**During**
Demographics	**Metrics Analyst Analyst/Trainer**	**Before During**
TEIR	**Observer/Trainers Analyst/Trainer**	**During**
Group Dynamics	**Observer/Trainers Analyst/Trainer**	**During**

From this data, the Training and Feedback Metrics Report (TFMR) is developed and provided to the training audience leadership as well as the mobile training team. It gives the training audience an initial sense of "where they stand" on collective knowledge about operational level planning and operations. It also provides the MTT with detailed information about the training audience's strengths and weaknesses, which permits the observer/trainers to tailor academics and develop informed expectations about the training audience's likely performance during the exercise. During academics and the exercise, the O/Ts and the Analyst/Trainer (A/T) collect data and use it to provide further feedback to the training audience during the exercise, facilitated after action review, and the summary report.

To support these products, the MTT collects four types of data during an SGST or large collective exercise. The first is observations of processes and procedures. Were the training audience members following current joint doctrine?

Did they manage information effectively? Did they focus on operational level considerations and avoid tactical concerns?

The second is recording the training audience's relevant demographics, something not completely collected in the learning management system. Example demographic questions are: rank, time in service, time in current unit, duty position, short duty description, number of months spent in specific positions in the past (e.g., number of months spent serving in a JOC during past tours), and completion of online training. The questions depend on unit training objectives and initial impressions after observing for a half day. The responses provide insight into training audience attributes such as applicable experience, and cumulatively whether the skills are available within the group to effectively solve the problems presented.

Third and fourth are data from the CPRO form. The cumulative number of ticks in each category are then added up and expressed as quantifiable percentages. The MTT also writes down instances of speech to provide context and facilitate later checks for interrater reliability. Journal notes are also used as supporting data to check validity of the ticks. In combination, the MTT can draw conclusions about how well the group moved through the problem solving process that contributes toward a more complete picture of group cognitive performance, strengths and weaknesses, and underlying explanations. The A/T also takes the O/T journal and CPRO comments, codes, and categorizes them. Those comments are grouped into categories and then converted into percentages within that category. Analysts also watch for additional themes that emerge and pursue them if they are useful.

After collecting copies of the journals and the CPRO Forms, the A/T analyzes the data and develops the summary report. The report is written as a narrative and includes sections describing the planning effort, training audience, execution, and then presents outcomes from the analysis of processes and procedures, cognitive performance, and group social dynamics.

CASES: OPERATIONAL PLANNING TEAMS (OPT) AND JOINT OPERATIONS CENTERS

The Joint Staff J7-Training supported six Staff Exercise (STAFFEX) training events that included measurements of operational planning groups; three of those events are described below. None of the headquarters were standing joint task force headquarters, but each was a tactical level headquarters with a requirement to be "joint task force headquarters-capable." Many of the staff members had not yet had the necessary formal education for this task. If one of the headquarters was designated as a JTF core headquarters, they would receive additional personnel with the requisite experience to ensure success. During the events, five groups were measured, and three will be presented here.

Headquarters One had just completed 80% personnel turnover, and the primary training objective was to re-constitute the staff's ability to plan and operate at the operational level. The JKO online training included four courses on fundamentals of joint planning and operations for a total of about eight hours of training. The online training analyst found that about 25 personnel (or 30% of the estimated potential training audience) completed one or more courses, and cumulatively those 25 completed 47 courses. Of the 47, pre- and post-test scores were slightly above average in comparison to similar training audiences and seven courses were completed at the pre-test level (meaning that the personnel had enough knowledge to test out). Taken together, the data indicated that the training audience for the most part did not complete the training, and among those who did, there were two or more individuals who had significant knowledge.

Using this information together with previous experiences with many training audiences, the MTT prepared and presented academics with the expectation that the training audience as a whole knew very little about operational level planning and operations while expecting one or more knowledgeable and experienced personnel to surface and ask informed questions. The online training analysis was accurate. About forty personnel attended academics at any given time during the six hours of training. A very small group of six senior enlisted and officers asked informed questions while the group as a whole remained quiet. Those six also dominated the final panel discussion.

The headquarters formed an OPT to conduct crisis planning, and it included about 16 personnel (E5-E7, O2-O4). Two O4s led the OPT and both were experienced planners. The members of the OPT did not have experience with joint planning beyond what they received during academics. The OPT leaders were aware of these shortcomings and focused more on how to plan and less on developing one. The OPT's TEIR profile tracked with their approach. There

was very little triggering because the OPT leaders defined the problem for them at each planning step. Resolution was also minimal because the group deferred to the leaders. The group, however, was able to participate in the discovery of facts and assumptions, and how they fit together. The OPT leaders tightly controlled discussion, making sure the group stayed on schedule and completed the assigned planning tasks.

Socially, the group's intra-dialogue was mutually supportive, meeting the participation and behavior expectations of military organizations. There was, however, a significant event that reminded the analysts about the dangers of data bias. During the OPT, one officer occasionally participated who dominated discussion, causing the junior members to stop participating. The O/Ts took note of this whenever the officer joined in. After the exercise, the analysts looked at the CPRO Forms and journal notes, and they noted 22 comments about domineering leadership. After discussions with the O/Ts, the lead analyst reached the conclusion that the O/Ts were overly biased to make negative comments for exceptional events, but not for non-exceptional exchanges. In other words, the occasional interlude of the officer was an exception to the rule and the OPT compensated effectively. O/Ts are now made aware of this type of data bias during O/T training.

This same event also illustrated that training audiences were potentially interested in group dynamics feedback. Toward the end of the event, the analyst was talking to the OPT leaders and mentioned the impact of the officer who dominated the discussion. The OPT leaders asked questions and initiated a short discussion about group dynamics.

There was no compression or reflection (figure 3). The OPT leaders were experienced and free to adjust as needed. They did not have to prepare for an out-brief, so there was little pressure. They knew they were in a learning environment and free to skip difficult topics. The MTT was present to assist as needed.

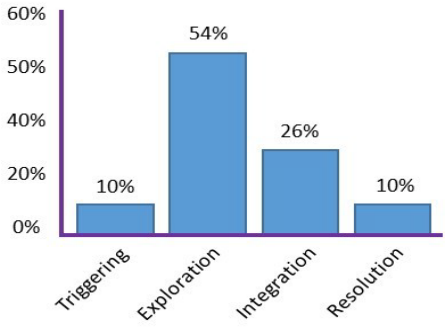


Figure 3. Headquarters 1 OPT TEIR Profile.

The Joint Staff J7 supported a second STAFFEX for **Headquarters One** about six months later. The purpose was to refine operational level planning processes and procedures and to rehearse for an upcoming joint exercise where Headquarters One would operate as the JTF core headquarters. Unlike the previous STAFFEX, the personnel situation was more stable, and Headquarters One decided not to assign the online courses in preparation for the second STAFFEX, relying instead on the previous STAFFEX and real-world operations experiences as preparation. This decision meant that the MTT would not have a TFMR to provide a baseline of the training audience's knowledge and expected level of engagement. The O/Ts assumed the training audience would possess a mix of experiences and prepared to teach to the lowest level.

External events impacted the STAFFEX. Shortly after the MTT arrived, Headquarters One pulled all of its experienced planners for a potential real-world operation. Headquarters One still wanted to conduct the training, however, and provided junior personnel who were inexperienced. For academics, the most important impact was the absence of experienced personnel to ask informed but probing questions or initiate broader perspectives to enhance deeper learning. Without the experienced staff members, the MTT spent more time lecturing on the basic concepts than was preferred, which limited opportunities for higher-order learning. When opportune, the O/Ts interspersed more probing discussions to enable broader operational considerations and higher-order learning (critical thinking, problem-solving, anticipation, etc.).

Headquarters One formed an OPT comprised of fourteen members for SGST training with about the same experience as the previous STAFFEX with exception of the leader, who was less experienced. The demographics survey indicated that the average member had served in Headquarters One for three months, and none of them had participated in the previous STAFFEX. The OPT leader had previously served in a JTF HQ but had never led an OPT. The OPT, however, performed well procedurally, which was attributable in part to the presence of well-established planning procedures. The biggest weakness was an almost complete lack of knowledge about operational level planning and operations other than what they learned during academics. It was evident that the formal academics had only familiarized the training audience with the basic knowledge, and the O/Ts continually stepped in to assist. With the help of the MTT, they ultimately developed an operational level product but did not fully understand it. This became apparent during

the final out-brief when the briefers could not fully explain briefing bullets or effectively answer questions asked by the Chief of Staff.

The TEIR profile reflects disciplined adherence to planning procedures and the willingness of the O/Ts to answer questions. The problem statement given to them was clearly presented, which limited triggering, and they spent their time developing facts and assumptions, then discussing how they fit together. The O/Ts assisted whenever they bogged down. There were no observations for resolution because the OPT leader quietly made final decisions with each subgroup leader while developing final briefing slides, and the MTT was unable to observe them (figure 4).

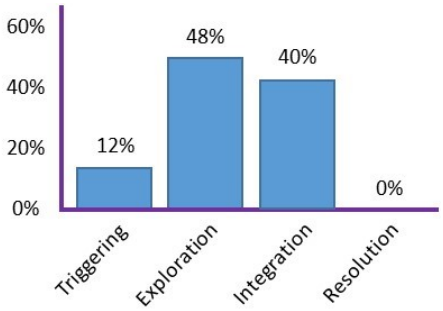


Figure 4. Second Headquarters 1 OPT TEIR Profile.

Group dynamics were excellent. The members were enthusiastic, and although ad hoc, they were familiar and comfortable with each other. Discussion was lively, they freely criticized each other's ideas, corrected within-team errors, and minimized within-team chatter. The OPT actively included everyone and closed the loop on communications. Their major weakness, as expected, was their inability to use relevant "jargon and vocabulary."

Like the first STAFFEX, the OPT experienced limited compression or reflection but did demonstrate understanding of the fundamentals of the joint operational and planning process by effectively completing their assigned tasks in a semi-immersive problem-based scenario.

Headquarters Two conducted JOC training as part of preparation for a large collective joint exercise, and preparation contained the elements of BLTS except for measurement of all of the B2C2WGs. Online training included four required and two optional courses totaling about ten hours of training. Participation was high ; 185 personnel out of an estimated potential training audience of 300 completed at least one course. The highest was *Joint Operations Planning* with 155 completions, and the lowest was *Design and Planning* with 133. Also, E8s, E9s, and O6s combined to complete 27 courses. Personnel tested out of 27 courses at the pre-test level. The pre- and post-test scores were about the same as two other similar commands that completed online training within the past year. Together, these numbers indicated that Headquarters Two was treating the training event as important, and O/Ts should expect a highly engaged training audience with participation from E9s and O6s who had operational level experience, and O4/5s with at least operational level knowledge.

Unfortunately, a mix-up prevented the O/T team from getting the TFMR in time to help prepare and present academics. The O/Ts quickly discovered, however, that the training audience was highly engaged because of participation of several primary leaders at the O6 level who stimulated the dialogue with broadening questions that were candid and inclusive. The O/Ts reported that senior level participation led to insightful and interesting exchanges and a heightened level of engagement by more junior personnel who were given agency for speak freely.

The Joint Operations Center was manned mainly by a mixed staff of inexperienced and junior members who collectively lacked the doctrinal understanding to operate effectively at a joint operational level. The JOC totaled 28 personnel, of which five had served in a JOC during a previous assignment. Nearly all positions were filled by personnel at least one grade below the norm for what the position called required. For instance, the J1 watch officer was an E5 where an E7 would normally be considered a minimum, and the senior watch officer was an O4 where an O5 was the norm. The available standard operating procedures document was not sufficient.

The first JOC battle drill task was a downed aircraft and personnel recovery event, which is an inherently complex, time-sensitive mission. JOC leaders were initially confused on what to do, while junior personnel waited for instructions. No progress was made for about forty-five minutes. The MTT encouraged JOC leaders to conduct an in-stride reflection session to adjust their framing and concentrate on their priorities to "understand the problem." The JOC chief announced a pause in training and asked everyone to introduce themselves and to explain their functional responsibilities, a basic step that was overlooked at the beginning. To the JOC members' surprise, a personnel recovery expert introduced himself and gave a short tutorial on the joint planning and coordination requirements that characterize personnel recovery. Other personnel articulated problems that needed to be resolved but didn't know

what process to follow. The Reports Officer stated that she did not have any report formats procedures and wanted to know where to find them. The JOC chief ended the reflection session by giving guidance, and the JOC quickly began to gel as a team.

From that point forward, JOC members in leadership roles began to exert their leadership, developing more effective processes and procedures for information gathering and sharing, intelligence fusion across cross-functional disciplines like Surgeon, Cyber and Personnel members. Information sharing, coordination, processes and procedures gradually improved. For instance, the JOC did not generate the required reports to higher headquarters on days one and two. By day three, JOC personnel had obtained the proper report formats, established information sharing procedures, and rapidly generated, obtained approval, and sent all of the required reports—all while dealing with two simultaneous battle drill problems. Of note, long-running efficient JOCs are very quiet as people work. The Headquarters One JOC was buzzing with open chatter on day one but was relatively quiet by day three.

The TEIR profile reflects the JOC's initial failure and progression toward success (figures 5-7). The triggering and exploration on day one without resolution tracks with the first day failure. Diminished triggering and increased integration without resolution tracks with the second day's progress. The minimal triggering and presence of resolution on day 3 tracks with JOC success.

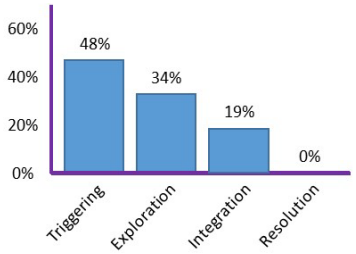


Figure 5. STAFFEX 2 JOC TEIR Profile for Day One

For group dynamics, deficiencies surfaced that were associated with leadership. Leaders did not understand the events well enough to establish meaningful priorities or clearly communicate tasking needs within the team. They were also unable to actively reinforce team priorities. Also, the JOC never achieved a common language and often relied upon metaphors and generalities. The lack of knowledge about the operational level prevented personnel from using Joint jargon and vocabulary.

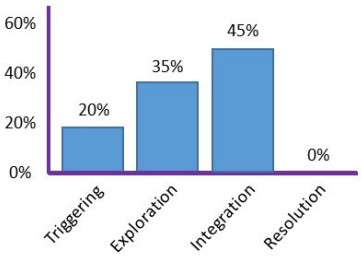


Figure 6. STAFFEX 2 JOC TEIR Profile for Day Two

The JOC experienced significant compression and reflection. A personnel recovery event was presented first and exposed all of the JOC's weaknesses simultaneously. Within thirty minutes, the JOC had stopped functioning, personnel were waiting for guidance, and leaders did not understand Joint personnel recovery well enough to provide it. The MTT then recommended to the JOC chief that he pause, conduct reflection, and then resume the exercise. Along with introductions, the JOC chief gave everyone an opportunity to speak and provide their assessment of what needed to be done. After reflection, the group began to make progress with the personnel recovery task and the establishment of processes and procedures needed to function. In this way, the JOC's cognitive ability to problem-solve, anticipate and critically think as an integrated team may also have improved by the end of the staff exercise.

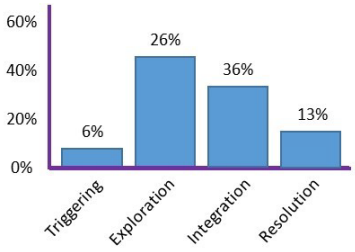


Figure 7. STAFFEX 2 JOC TEIR Profile for Day Three

LESSONS LEARNED

Even with the presence of intervening variables such as real world events and online/distributed hiccups, the BLTS exercises conducted for Headquarters One and Headquarters Two indicate that the components of BLTS do work together as designed. Yet the greatest challenge for the BLTS is the current inability to reliably determine whether the staffs are effectively assessing and evaluating multi-layered, complex problems, and producing nuanced, reasoned, and strategically minded recommendations. There is still much room for innovation and improvement in our measures and assessment processes. As a practical matter, the Joint Staff J7's charter is to provide operational level training, which demands these cognitive attributes. An initial effort may be to develop a methodology for measuring whether a group is thinking at the operational level and then consider measuring gradations and progress later. Part of the solution may lie in a speech coding approach similar to the TIER methodology.

The **TFMR** was reliably predictive and able to assist with tailoring academics to weaknesses versus teaching "in the blind," without any baselining. Online training participation was higher in Headquarters Two, and many of the E8/9s and O6s completed courses. Adding in the personnel who had the knowledge to test out of the online courses, the O/Ts could reasonably expect an engaged training audience with a large number of experienced and knowledgeable participants, which is what happened. Online participation was lower in Headquarters One, and few E9s and O6s completed courses. Adding in the few personnel who had the knowledge to test out of courses, the O/Ts could anticipate less engagement with a smaller number of experienced and knowledgeable participants which occurred during the first STAFFEX.

There were three easily fixable challenges that limited the full effectiveness of the TFMR. First, the O/Ts did not receive it in time because of internal miscommunications to make adjustments for Headquarters Two, and the primary presenter for Headquarters One received it at the last moment because another exercise delayed his arrival. There is a balance between giving training audiences as much time as possible to complete courses and pulling data to develop the analysis in time to be useful. This challenge must be coordinated for each training event. The second is understanding and trusting the TFMR. Discussions with O/Ts indicate that they tend to err on coloring their preparations from previous experience. This bias should improve over time as education, training, and familiarity increase. Third, the TFMR format presents a new, innovative approach that O/Ts still require more time and hands-on experience to internalize. The analysts need to work with O/Ts and re-design the TFMR accordingly.

TEIR helped to explain why groups succeeded or failed during the problem solving process. The first two OPTs were well led, equipped with established planning processes, and moved through problem solving easily. The JOC, in contrast struggled with unprepared leaders and an absence of processes and procedures. TEIR accurately tracked both success, failure, and improvement.

The biggest challenge with TEIR is actually using it. O/Ts have many duties, and data collection is only one of them. Only the A/T consistently collected data, and O/Ts were often spread thin in the training environment. The next challenge is ensuring that all of the collectors have the same understanding for each of the four categories. For instance, triggering can often be interpreted as exploring or integrating because the main discriminator is whether the group is developing a common understanding of the problem or has achieved it. The solution for these challenges is education, training, experience, and guarding against bias by constantly watching context (Rourke, Anderson, Garrison, & Archer, 2001).

Group dynamics measurements helped to capture and explain why groups succeeded or failed. When an OPT was succeeding, the group dynamics attributes tracked with it. When there was a shortcoming, one or more of the group dynamics helped to explain and provided a start point for solutions. In the JOC, which was larger and more complex, the group dynamics attributes were useful for helping to explain the initial confusion among JOC personnel.

The biggest challenge for group dynamics is the absence of a standard. It helps to explain what an O/T understands through years of experience, but currently there is no matrix for separating excellent group dynamics from adequate and poor. Greater precision will be useful to simplify explanations to leaders who ask questions and read the summary reports.

CONCLUSION

The BLTS is an ongoing attempt to take the best practices of learning and data collection from the private sector, and institutionalize them consistent with the priorities and processes in the existing Joint Training System. The way ahead is to begin working on improving measures and assessments of cognitive performance and to build on the current BLTS components. While assessing the overall effectiveness of training is always problematic, the training audiences and their leaders from the case studies were satisfied with the outcomes and additional scrutiny underwent during their training. Both Headquarters One and Headquarters Two have invited the Joint Staff J7 back for subsequent BLTS events. The BLTS team, with the continued cooperation of participating staffs, looks forward to improving current tools and developing new ones that will heighten staffs' ability to provide the nuanced, reasoned, and strategically-minded analyses and recommendations that commanders need and expect.

ACKNOWLEDGEMENTS

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