



Research Report 2028

**Conveying Research Insights to the Operational
Force: Development of the *Managing Complex
Problems* Resource**

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CONVEYING RESEARCH INSIGHTS TO THE OPERATIONAL FORCE: DEVELOPMENT OF THE “MANAGING COMPLEX PROBLEMS” RESOURCE

EXECUTIVE SUMMARY

Research Requirement:

Army leaders in the 21st century face conditions of unparalleled complexity. Increasingly, they are tasked with managing operational environments that are multi-faceted and highly dynamic, and often conducted in the “gray zone,” where the nature of the conflict itself is unclear (ISAB, 2017). Responding to the need for Army leaders who can effectively manage complex operational problems, in 2011 the U.S. Army Research Institute (ARI) initiated a multi-year program of research on Army Design Methodology (ADM) and strategic thinking. The ARI research program encompassed a set of research projects related to adopting, developing, and sustaining the cognitive skills associated with design and strategic thinking.

While the ARI research program has accumulated an extensive set of findings related to design and strategic thinking in the Army, these findings may have greater utility to Army leaders if the resulting insights and tools are accessible in a format that is user-friendly and non-academic. The operational community needs a resource where theory and empirical findings from ARI research are translated into applicable guidance. The *Managing Complex Problems* (MCP) resource is a multimedia website that was developed to address this need. The goal of this report is to describe the development and format of the MCP resource, which is a practical research-based resource to help the Army make sense of, and determine ways to manage, complex problems.

Procedure:

In support of the research requirement, a systematic examination of the research reports and products developed under ARI’s program of research was conducted to identify key insights that emerged across the set of research studies. This synthesis of research findings served as the basis for resource content, messaging, and organization. In parallel with the research synthesis, a user needs analysis was conducted to identify user information requirements, preferences for format and preferred modes of access of the resource, and to identify necessary features of the resource. The user needs analysis was also used to identify existing web-based platforms available in the Army for housing the resource, and to understand the relative advantages of each platform.

Following the synthesis and user needs analysis, a website was developed through multiple iterative cycles of design, review, and revision, beginning with storyboarding and development of the graphical user interface (GUI). Content for the storyboards was derived from the synthesis of research reports and written in practical, non-academic terms. Additional content was created through video-taped interviews with subject matter experts (SMEs) in strategic thinking. Finally, an initial evaluation of the MCP resource was conducted to examine the usability of the resource, as well as its perceived utility (value) in enhancing knowledge and skills related to managing complex operational problems.

Findings:

The research team identified a set of overarching findings that drove the design and development of the resource. For example, a review of reports and products from ARI's research program led to a new, conceptual framework for the practical resource based on goals of – and core activities involved in – strategic thinking and design. The synthesis of these findings is described in more detail in ARI Research Report ##### (Grome, Weyhrauch, Crandall, Polander, & Laufersweiler, **in preparation**). Interviews from the user needs analysis provided insight into the types of digital format options that would be useful for the resource (e.g., interactive PDF or website), as well as Army portals that could house the resource (e.g., Central Army Registry). The user needs analysis also underscored the critical role of an advocate and a communications outreach strategy to help enhance awareness and use of the resource. Finally, a user evaluation survey provided useful insights about the concepts, utility, and technical considerations. Overall, users described the resource as a valuable and potentially useful tool for a wide Army audience. The resource can be found at the Central Army Registry (CAR) with the following link:

<https://rdl.train.army.mil/catalog-ws/view/ARIManagingComplexProblems/index.html>

Utilization and Dissemination of Findings:

The MCP resource can benefit a variety of stakeholders, including current and emerging Army leaders interested in preparing themselves and their units for managing complex problems in operational settings, and those interested in creating unit climates that encourage the mindsets and behaviors associated with design and strategic thinking. The product can also be used by instructors who teach advanced cognitive skills related to design and strategic thinking in their classrooms and individual Soldiers or unit commanders who wish to develop these advanced cognitive skills within themselves or their units. Ongoing improvements will continue to ensure the resource is accessible, user-friendly, and useful to Army leaders for preparing them for the activities involved in managing complex problems.

CONVEYING RESEARCH INSIGHTS TO THE OPERATIONAL FORCE: DEVELOPMENT OF THE “MANAGING COMPLEX PROBLEMS” RESOURCE

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Introduction

Operational Need

Army leaders in the 21st century face conditions of unparalleled complexity. Increasingly, they are tasked with managing operational environments that are multi-faceted and highly dynamic, and often conducted in the “gray zone,” where the nature of the conflict itself is unclear (ISAB, 2017). Responding to the need for Army leaders who can effectively manage complex operational problems, in 2011 the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) initiated a multi-year program of research on design thinking, Army Design Methodology (ADM), and strategic thinking. The ARI research program encompassed several research projects in this area: *Incorporating design into Army operations: Barriers and recommendations for facilitating integration*; *Exploring strategic thinking: Insights to assess, develop, and retain Army strategic thinkers*; *Identification of the requisite knowledge, skills and abilities for design*; *An integrated planning system: Integrated planning handbook, A design team evaluation framework*; *Best practices in military design teams*; *Enhancing the strategic capability of the Army: An investigation of strategic thinking tasks, skills, and development*; *Developing metrics of performance for the Army Design Methodology*; *Visualizing complex problems*; *Developing cognitive and behavioral skills associated with strategic thinking*.

While the ARI research program produced many findings and plenty of useful guidance related to design and strategic thinking in the Army, these findings should have greater impact on Army leaders if the information is made accessible in a user-friendly, non-academic, and palatable format. Transitioning research insights into practice is an ongoing challenge for organizational management researchers (Anderson, Herriot, & Hodgkinson, 2001; Beer, 2001; Panda & Gupta, 2014; Shapiro, Kirkman, & Courtney, 2007). It is unlikely that most Army leaders would spend the time needed to review volumes of research reports to cull operationally-relevant findings. Instead, the onus is on the research community to translate findings in a way that is operationally relevant and accessible. The operational community needs a user-friendly resource where empirical findings are translated into applicable guidance, and where Army leaders can access relevant insights that the leaders can apply directly to the work they do. The *Managing Complex Problems* (MCP) resource, further described in this report, is a multimedia website that was developed to address the operational community’s needs. The resource can be found at the Central Army Registry (CAR) with the following link:

<https://rdl.train.army.mil/catalog-ws/view/ARIManagingComplexProblems/index.html>

Research Findings Synthesis Effort

The research and development effort detailed in this report describes the translation of research findings into operationally-relevant guidance to help Army leaders make sense of, and determine ways to manage, complex problems. The effort was coupled with a larger initiative that provided a synthesis of findings from ARI’s program of research on design and strategic thinking. Findings from the synthesis effort were used as the basis for development of the MCP resource and are described in detail in a separate, concurrent report (Grome, Weyhrauch, Crandall, Polander, & Laufersweiler, **in preparation**). This report describes the MCP resource

development process, including the user needs analysis, curation of content, design, and evaluation of the resource.

Overview of Development Effort

The conceptual foundation for the content of the MCP resource came from a related effort to synthesize and integrate ARI's design and strategic thinking research findings. Additional content was derived from a variety of literature and sources in related fields. Finally, a major category of original content for the MCP resource consists of interview recordings conducted with three subject matter experts (SMEs) in the application of design and strategic thinking in the Army. An iterative cycle of development, review, and revision was employed throughout the development of the MCP resource, according to best practice in Cognitive Systems Engineering (CSE; Hollnagel & Woods, 1983) and user-centered design (UCD; Norman & Draper, 1986).

Certain design principles guided the development of the resource from initial storyboarding all the way through the final iterations. These design principles were also considered when creating evaluation materials. The primary principle was to ensure that content was presented in a digestible format, and organized for easy navigation through the website. The MCP resource is organized into three modules: Complex Problems, Practical Guidance, and Building Thinking Skills. The modules were designed to be consistent in format and functionality, with language appropriately clear and meaningful to the user, and visual feedback to communicate potential user actions.

Method

Review and Synthesis of Reports and Research Products

The development of the MCP resource was initiated by the operational community's need to help Army leaders gain insight and practical guidance to make sense of and manage complex problems. The first major activity in developing the MCP resource was reviewing and synthesizing findings from ARI's research program on design and strategic thinking. Reports and products from the ARI research program were reviewed and synthesized for key findings and insights. This synthesis served as the basis for the content and key organizing frameworks used in the MCP resource. These organizing frameworks are described in the results section. For a detailed description of findings from the research synthesis, see "Managing Complex Problems: A Synthesis of Research on Army Design Methodology (ADM) and Strategic Thinking" (Grome et al., **in preparation**).

User Needs Analysis

The second major activity of the MCP resource development was the user needs analysis. The user needs analysis served two purposes:

- 1) To understand the information needs and preferences of the targeted user group(s), their envisioned context of use, and preferred mode of access; and,
- 2) To identify existing digital formats and platforms available for housing the resource and the relative advantages of each option.

A total of 14 interviews were conducted for the user needs analysis. The majority of the interviewees included stakeholders who had ideas about potential user communities within the Army and how the communities could use the digital resource. A second group of interviewees included those who had insight into potential technology platforms available for housing the resource. The first objective (understand information needs and preferences of targeted user groups) was addressed indirectly through interviews with the high-level stakeholders. Table 1 summarizes the organizations represented by participants in the user needs analysis.

Table 1
Organizations Represented in User Needs Analysis

Primary Interview Focus	Organizational Affiliation
Users and Context of Use	Army War College (AWC)
	School for Command Prep (SCP)
	Training and Doctrine Command (TRADOC)
	Institute of NCO Professional Development (INCOPD)
	Army Capabilities Integration Center (ARCIC)
	Asymmetric Warfare Group (AWG)
Digital Platform Options	Army Distributed Learning Program (ADLP)
	Advanced Distributed Learning Initiative
	TRADOC, Army Capabilities Integration Center (ARCIC)
	Center for Army Leadership (CAL)
	Army Training Support Center (ATSC), Combined Arms Center Training (CAC-T)
	Army Training Information System (ATIS), Army Training Support Center (ATSC)
	TRADOC Capability Manager - The Army Distributed Learning Program (TCM TADLP)

The topics covered in the interviews varied slightly depending on the interviewee, but general topics covered included:

- Who might use the resource
- What information potential users would need and want in the product
- Relative advantages and disadvantages of particular technology platforms
- How to position the product to gain both initial and long-term exposure

For additional detail, see interview guides in Appendix A.

In addition to these interviews, multiple discussions were conducted with software developers from Applied Research Associate’s Engineering Science Division (ARA/ESD), who were responsible for developing the user interface and embedding the content and associated

links. These individuals provided additional guidance on digital format options, including the relative advantages of options, such as interactive PDF (iPDF) or website format.

Iterative Design and Development

The design and development of the MCP resource followed a frequent iteration process of prototype review and refinement. The content was first developed as an outline, followed by an information architecture (organization structure), which resulted in high-level storyboards. Each storyboard contained developer notes, linkages among content, and intended links to additional resources.

Simultaneously, multiple initial renderings of the graphical user interface (GUI) were developed for review. The GUI concepts represented different potential versions of the resource “look and feel,” with various layouts of visual and informational elements. Following review and feedback by multiple individuals, and various iterations, the GUI was finalized for developing code and embedding content.

While the content and interface were being developed, the team also held multiple conversations with individuals at The Army Distributed Learning Program (TADLP) to understand the technical requirements for housing the MCP resource on an Army server. Once the decision was made to create a website rather than an iPDF, largely due to issues with video size requirements, which made the website option more suitable, the development team began embedding content into the GUI for the MCP resource.

Expert Interviews

The third major activity in developing the MCP resource was recruiting and producing video interviews with Army experts in the subject matter of making design and strategic thinking applicable to Army leader development. In particular, the expert perspective interviews were designed to supplement four strategic thinking skill-building exercises featured in the resource (Grome, Crandall, Karrasch, Sackett, Santos, & Greer, 2020). The skill-building exercises provide practice in behaviors and cognitive skills associated with strategic thinking and design. The exercises address skills such as reflective thinking, questioning, systems thinking, and thinking in time. The intent of the videos was to provide expert views on the exercises, including the importance of practice for building skills related to strategic thinking, and examples of how the experts might approach the activities in the exercises.

The research team conducted three interviews with SMEs in strategic thinking and complex problem solving: Lt. Gen. H.R. McMaster, then Director, Army Capabilities Integration Center and Deputy Commanding General, Futures, US Army Training and Doctrine Command; then Col. Paula Lodi, Commander, 44th Medical Brigade, and Dr. James Greer (Col., Ret.), formerly of Abrams Learning and Information Systems.

Interview and Videotaping Process. An interview guide was created with a set of questions to ask the SMEs. The interview protocol reflected the content of the strategic thinking exercises and was designed to elicit comments about different aspects of the exercises. For each individual interview, the questions were prioritized and a tailored interview guide was created to suit that SME and constraints associated with that interview. For example, one SME was able to

provide several hours' worth of time for the interview. Therefore, a larger set of questions for each of the four exercises was able to be covered in his interview. The interview session with one of the SMEs was limited to an hour, so a set of questions most relevant to this SME's rank, and believed to be most valuable to the resource, was selected.

Prior to each interview, the SME received a set of materials that included an interview preparation guide with information about the purpose of the interview, intent for the use of the video, and the process for conducting the interview and recording (see Appendix B). The SME was also provided with an overview of the four skill-building exercises and background information on how and why the exercises were developed. Each SME also received an interview guide that included the intended questions to ask (see Appendix C for full interview guide). For two of the SMEs, phone conversations were conducted prior to the interviews to help prepare the SMEs and to address any questions they had. For the third SME, the preparatory materials were shared with the SME via email.

A team of at least two researchers and a videographer participated in each interview. Following set up of the video equipment, the interview was conducted with one member of the research team leading the interview. The videographer recorded each question and SME responses, then paused the recording for discussion within the team. In some cases, the team requested an additional take; in others, the team determined the take was satisfactory and moved on to the next question. Once the interview was completed, the videographer uploaded the raw video footage to a private YouTube site for review by the team.

Video Review and Editing. Each video was transcribed and transcriptions were used for clip identification, identification of quotes for potential use in the resource, notation of timestamps, and for editing. The process also included assignment of "descriptor tags" to each video clip and notation about placement of the video within the resource. Appendix D includes a description of the video review process.

The video review document was shared with the ARA/ESD video editors to communicate the desired clips for editing. Following initial editing of the video clips, the video editors shared the clips with the research team for review via the private YouTube site. The research team identified additional edits needed, including text appearing on screen (i.e., introductory question, and title and name of the SME). During this process, the video editors incorporated images to complement what the expert was discussing. Once edits were made to the videos, video clips were sent to the SMEs for their review and approval.

Video Clip Topics. The topics discussed by the SMEs in the videos corresponded to the descriptor tags noted in Appendix D. The topics ranged from general questions about strategic thinking and the important role of practice in skill development, to questions specific to each of the four practical exercises. For example, topics included the following:

- Why reflecting, asking powerful questions, thinking holistically, anticipating, etc. are important skills for managing complex operating environments
- Why it is important to practice the skills associated with strategic thinking
- How the exercises are useful in gaining practice in the skills
- Strategies for exercising the skills in daily work

Because more time was available for an interview with one of the SMEs, the videos of this SME's interview also included examples of the SME's responses to the "Questioning" and "Telling a Story" exercises.

Inclusion of Videos in the Resource. As content for the MCP resource was refined, video clips were selected for inclusion and placement at various points in the resource. Most of the videos were placed in the skill-building exercise portion of the resource. However, some videos were deemed as useful augmentations to other portions of the resource to reinforce key concepts and add interest and impact for the user experience. The full set of videos were placed in a filterable video library.

Evaluation

Following completion of the MCP resource alpha version, the research team conducted an evaluation to assess the tool's usability and utility for Army leaders. Gathering feedback from the user population was intended to gain a preliminary assessment of perceived value of the resource in improving knowledge and skills related to design and strategic thinking, and to provide insight into how the product can be improved to best serve users' needs. User feedback from this evaluation will be used to inform future revisions to the resource that will improve the presentation and organization of content, usability, navigation, and overall design.

Participants. The research team sent the evaluation materials to a total of 15 participants. Participants were members of the MCP resource's target audience, including 1) company- to brigade-level commanders and planners, and 2) instructors of courses in Army Design Methodology (ADM) and strategic thinking, or related topics. Participants were identified through ARI's contacts at: the Regional Leadership Development Program (RLDP) U.S. Army Pacific (USARPAC), the Center for Army Leadership (CAL), and at schoolhouses including University of Foreign and Military Cultural Studies (UFMCS). Participants at the 44th Medical Brigade were also identified through the research team's consultant and subject matter expert. From the initial set of 15 confirmed evaluation participants, a total of 7 participants completed the evaluation and returned their evaluation data. Participants included individuals from: The University of Foreign Military and Cultural Studies (UFMCS; 3), Army Medical Brigade (1), U.S. Army War College (USAWC; 1), Center for Army Leadership (CAL; 1), and U.S. Army Pacific (USARPAC; 1).

Procedure. Participants were contacted via email to confirm their willingness to participate in the evaluation and then provided with: a project summary, a step-by-step guide that contained the website link and instructions on what to review (see Appendix E), and a set of surveys to complete (see Appendix F). Participants explored the resource on a laptop or desktop computer. Following review of each module, the users completed a questionnaire relating to usability and perceived usefulness for that module.

The survey consisted of a set of a) background questions (e.g., role, organizational affiliation, rank etc.), b) Likert-type scale items (1-5) assessing perceived utility and usability, and c) open-ended questions. As shown in Table 2, a portion of the Likert items assessing resource usability were adapted from Brooke's (1986) System Usability Scale, along with items assessing perceived utility/value of the resource, impact on knowledge and skills, and open-ended questions for each module.

Table 2

Examples of Likert-Type Scale Items and Open-ended Questions for the Three Modules

Assessment Topic	Examples
Resource Usability	I thought this module was easy to navigate.
	I found the various components in this module were well integrated.
	I found this module cumbersome/awkward to use.
Perceived Utility/Value	I think that I would use this module.
	I doubt I will use this module (either personally or with my unit).
	The material in this module will help me with my work.
Impact on Knowledge and Skills	After reviewing this module, I have a better understanding of what complex problems are.
	After reviewing this module, I have a better understanding of the main activities involved in managing complex problems.
	After reviewing this module, I understand the risks of underestimating operational complexity.
Open-ended Questions	What aspects of the module did you find particularly useful? How are they useful?
	What aspects of the module did you find <u>not</u> useful? Explain why you didn't find these aspects useful.
	What other thoughts or reactions to this module would you like to share?

Following completion of the Likert-type items and open-ended questions for each of the three modules, participants completed a final set of open-ended questions about the MCP resource as a whole, including questions about who could benefit from the resource and recommendations participants had for improving the resource. Participants sent completed surveys via encrypted email to ARI. The entire evaluation lasted approximately two hours for each participant.

Survey data were analyzed in two ways. Quantitative data (Likert-type items) were analyzed by calculating mean, range, and standard deviation across all data points. Qualitative data were analyzed using thematic analysis to extract patterns across responses.

Results

This section covers results of the review and analysis of reports, user needs analysis, expert perspective interviews, website design/development, and evaluation.

Review and Analysis of Reports

The full findings from the synthesis effort from the design and strategic thinking program are detailed in a separate report (Grome, et al., **in preparation**). The reports and products resulting from this program contain important and detailed information useful to Army leaders with interest in a particular topic (e.g., forming a design team). However, the purpose of developing

the MCP resource was to provide an entry point for self-development, featuring organized, consolidated findings from across the program of research on design and strategic thinking, thereby saving Army leaders time they would otherwise spend poring over individual research reports and products to extract takeaways. Furthermore, the resource provides a central hub for the synthesized information without the redundancy that would be experienced from reading all the reports and examining the individual products.

A core set of findings from the synthesis effort substantially influenced the direction of the design and development of the MCP resource. One such finding is the general discomfort and confusion associated with the term “design” in the Army, along with the lack of a shared lexicon or model for strategic thinking (Sackett, Karrasch, Weyhrauch, & Goldman, 2016). Given this finding, combined with the focus on the operational force as the primary user of the resource, the project team made the decision to refrain from framing the resource around guidance for design and strategic thinking, specifically. Instead, the team opted to frame the resource around *why* design and strategic thinking matter. In other words, the team considered what tasks and activities design and strategic thinking inform and support. Examination of the research found that design and strategic thinking in the Army shared a common goal, which was to make sense of - and determine approaches to managing - complex problems. In order to make an idea “sticky” and memorable, it should be simple, concrete, and credible (Heath & Heath, 2007). Following team discussion, the project team identified “managing complex problems” as the overarching framework for the resource. This approach gave the MCP resource a coherent message and organizing framework relevant to the operational force.

Another key finding from the synthesis was that, while the constructs were treated as distinct in the research, there were a set of core activities common to design and strategic thinking. These core activities included: (a) recognizing complexity, (b) understanding complex problems, (c) collaborating with others, (d) identifying potential solutions, and (e) capturing and conveying insights. This set of core activities served as an organizing framework for the practical guidance offered in the MCP resource.

User Needs Analysis

Findings from the user needs analysis are organized according to five main categories: (a) audience and context of use, (b) digital file format options, (c) resource hosting options, (d) characteristics of the resource, and (e) need for proponent and outreach.

Audiences and context of use. In general, interviewees described a broad range of potential audiences for the envisioned resource. Given the multi-faceted nature of the resource components (e.g., research products previously developed, including an Integrated Planning Handbook, a resource for design teams, Commander’s ADM Resource, and strategic thinking skill-building exercises), certain components may have different core audiences. For example, interviewees agreed that strategic thinking skills should be introduced early in a Soldier’s career while the Soldier’s thinking is still malleable. Thus, the strategic thinking skill-building exercises would likely be most useful for audiences ranging from cadets to Captains. Resources such as the Integrated Planning Handbook, the Commander’s ADM Resource, and the design teams’ resource would be useful for Commanders and planning staff ranging from Company to Brigade-level.

Some interviewees suggested that the resource would be accepted most in an educational setting due to time constraints in the operational context. Yet, interviewees also noted the challenge of getting components of the resource integrated into the curriculum. Given that there is already so much content to cover in a limited amount of time, the resource would likely offer the most value if used as a supplement to existing courses, or promoted for self-development. The schoolhouses mentioned as being potential venues for the resource as a supplement included:

- United States Military Academy
- Command and General Staff Officer's Course (CGSOC)
- School for Command Preparation (SCP)
- Basic Officer's Leader Course (BOLC)
- Captains Career Course (CCC)
- Army War College (USAWC)
- Basic Strategic Arts Program (BSAP)

Digital file format options. Another set of findings from the user needs analysis relates to file format options. In addition to the programmers, several interviewees described options for the resource format. The three options included:

- Webpage – links embedded in an existing website or a standalone website.
 - a. Advantage: flexibility afforded in expanding and building out content.
 - b. Disadvantage: the webpage requires a server to host it, along with potential ongoing maintenance.
- Interactive PDFe-Book (iPDF/EPUB) – content developed in specialized software that can be viewed on multiple platforms (computer, tablet, or smart phone).
 - a. Advantage: enables interactivity (e.g., search, hyperlinks, videos, buttons, annotation, highlighting) and design that can mimic the look and feel of a webpage.
 - b. Disadvantage: the video resources could not be self-contained within the iPDF/EPUB itself, which would require additional media products be developed and linked to the platform for video use.
- Mobile Application – through TCM Mobile (part of the TADLP)
 - a. Advantage: mobile-friendly means for users to access the resource on TRADOC's Application Gateway (TAG).
 - b. Disadvantage: the application would have to be custom-tailored to a variety of platform-specific requirements, which may become obsolete soon

Discussions with interviewees, in addition to the team's own research, suggested that application development was beyond the scope of the current effort due to the additional requirements involved. However, the project team determined that either a webpage or an iPDF was a viable option that afforded both interactivity and a fair amount of flexibility. An interviewee from TADLP initially described an iPDF as potentially preferable to a website because an iPDF is self-contained, lower maintenance, and less expensive to maintain over time. Additionally, an iPDF does not necessarily need to be hosted anywhere; an iPDF can be mailed back and forth, if needed. However, as the team explored the possibility of an iPDF further, it became clear that the video content of the resource reduced the potential utility of the iPDF

option. Due to video size, the videos could not be self-contained within the iPDF itself; the videos would need to “live” on a server. Thus, the initial perceived advantages of the iPDF were no longer as advantageous as originally thought. Additional discussion with members of TADLP and the developers revealed that a website would be more suitable than an iPDF to video content. Also, compared to an iPDF, it is easier to add content to a website over time, and a website is more suitable than an iPDF for viewing content on tablets and mobile phones. Because it is important that the resource can be updated as needed and accessed via mobile devices, the team ultimately proceeded with the website option.

Resource hosting options. Interviewees mentioned a number of potential online portals to host the resource. Despite the many ideas that were mentioned, the interviews did not originally support identification of a clearly optimal option. One consistent recommendation, however, was to avoid placing the resource on the Army Learning Management System (ALMS). The ALMS was characterized as a large and complicated system that was difficult to navigate and find what one was looking for, and therefore not user-friendly. An additional takeaway from the interviewees was that the MCP resource did not necessarily have to be hosted (or “live”) on an Army site. Table 3 presents a list of options offered in the interviews, along with notes about the options and their relative advantages and disadvantages:

Table 3
Resource Hosting Options – Advantages & Disadvantages

Resource Hosting Options		Interviewees Input
Army Learning Management System (ALMS)	Advantage	Well-established system focused on Army training.
	Disadvantage	Most interviewees recommended not placing the MCP resource here due to usability issues.
Army Training Network (ATN)	Advantage	ATN has good reach, and it has grown to be a central place for people to find educational resources.
	Disadvantage	Some interview participants described it as not particularly user-friendly.
Army Knowledge Online (AKO)	Advantage	AKO is accessible to every soldier.
	Disadvantage	Concerned that people would not go to AKO to find a resource like the one being developed in this effort.
Office of Personal Management (OPM) Innovation Lab webpage	Advantage	This recommendation was made by one SME with experience disseminating research findings.
	Disadvantage	Limited information was available about this website and the specific place the resource could reside.
Central Army Registry (CAR)	Advantage	CAR is designed to be a repository of training material. People access CAR for instructional materials and lessons.
	Disadvantage	CAR may make changes and not notify source developers, leading to broken links and usability issues.
Army Career Tracker	Advantage	This site is operated by the Institute for NCO Professional Development (INCOPD). Potentially, the MCP resource could be housed on the community webpage.
	Disadvantage	Site is now limited to civilians and enlisted cohort.
TRADOC Applications Gateway (TAG)	Advantage	TAG functions like an app store. Soldiers can download an app to their mobile device.
	Disadvantage	Requires building an app, which was determined to be outside the scope of this effort.
Virtual Improvement Center (VIC)	Advantage	The VIC is a portal for the Center for Army Leadership that contains leadership development resources, such as 360 assessments.
	Disadvantage	According to one interviewee, a disadvantage is that a lot of people do not visit the site.
Army University (AU)	Advantage	This website was viewed as a viable future option.
	Disadvantage	Development of AU was still in its infancy, and thus the timing may not be the best.

The site selected to host the MCP resource was the CAR. CAR was selected on the advice of The Army Distributed Learning Program (TADLP) because CAR is the Army’s central repository, and both civilians and Soldiers can access it to retrieve materials. Links to the CAR site can be provided on any number of other websites.

Characteristics of the resource. Another set of findings from the user needs analysis pertained to desired features of the digital resource. Interviewees offered several suggestions to consider in designing the product. Table 4 presents the primary suggestions.

Table 4
Primary Desired Features for the MCP Resource

Desired Feature	Description
Accessibility	The MCP resource has to be easily accessible; it cannot be buried or hidden multiple clicks down within a large site like AKO or ATN. In a related vein, a CAC card access requirement would be a barrier to use.
Engaging	The MCP resource needs to be as interactive as possible, and not a “wall of text.” If there is too much text, people will not use it.
Usability/Ease of Use	The MCP resource needs to be easy to navigate and user friendly. It should allow for quick reference, with hyperlinks to additional resources.
Clear WIFM	The “what’s in it for me” needs to be answered and depicted clearly and prominently.
Credibility	Some users will want to know that the tips and resources are grounded in solid research. Therefore, this should be noted explicitly, and users should have access to resources that describe the research if interested.
Attention to Labeling	The MCP resource should avoid labeling such as “Strategic Thinking” because of the connotations that will come along with the words “strategy” and “strategic.” Framing the resource as “tools that can help you solve complex problems” and/or “tools that supplement training and doctrine” will be more effective and will avoid automatically disengaging some groups of users.

Need for proponent and outreach. The last category of findings from the user needs analysis concerned the need for an Army institutional proponent/advocate and a strategy for communications and outreach. As one interviewee noted, “Development is one thing, getting it out to people is another.”

In order for the resource to be used and have the desired impact, the resource would need a high-level Army proponent who is willing to serve as a champion for it. Several individuals and organizations were suggested as potential proponents including: Army University (AU), Institute for NCO Professional Development (INCOPD), U.S. Army Sergeants Major Academy (USASMA), Army Capabilities and Integration Center (ARCIC), Mission Command Center of Excellence (MCCOE), and Maneuver Center of Excellence (MCOE).

In addition to securing a proponent, the user needs analysis underscored the importance of a communications strategy as essential to helping people become aware of the resource and its content, and to understand the value to them as users. The communications strategy could include a combination of briefings, workshops, conference presentations, webinars, papers, blog posts, and social media postings. Focusing efforts on a champion and communications strategy will foster the greatest probability of use and positive impact of the practical guidance and tools.

Expert Perspective Interviews

As described in the Method section of this report, part of content development for the MCP resource involved conducting interviews with strategic thinking SMEs. Interview footage was edited into 71 short clips (1-2 minutes each), focused on particular topics. The full library of expert perspective videos was integrated in the resource, along with other practical guidance content. As shown in Table 5, a user can search and filter the video library by expert, topic, and/or exercise (15 topics total; 3 experts, 8 general topics, 4 skill-building exercises). Videos relating to the exercises are also accessible directly through the MCP resource, which allows the user to access all exercise materials in one location.

Table 5

Filter Options for Videos by Expert, Topic, and Exercise

Filter	Individual/Title of Topic or Exercise
Expert	Lt. Gen. McMaster, Director, Army Capabilities Integration Center and Deputy Commanding General, Futures, US Army Training and Doctrine Command
	Col. Lodi, Commander, 44 th Medical Brigade
	Dr. Greer (Col., Ret), Abrams Learning and Information Systems
Topic	Understanding and Managing Complex Problems
	Importance of Strategic Thinking Skills for Army Leaders
	The Role of Practice in Building Thinking Skills
	Reflection Skills: Importance, Challenges, Strategies, Examples
	Questioning Skills: Importance, Question Types, Strategies, Examples
	Seeking Information from Diverse Sources
	Systems Thinking Skills: Importance, Strategies, Examples
Foresight Skills: Importance, Strategies, Examples	
Exercise	Asking Powerful Questions
	Telling a Story
	Envisioning Potential Futures
	Reflecting on Experience

Note. Experts are listed according to their ranks and official positions at the time of recording

Design and Development

Design and development of the resource yielded a multi-page website organized around three key topics: complex problems, practical guidance, and skill-building exercises. The overarching site architecture is depicted as a wireframe in Figure 1.

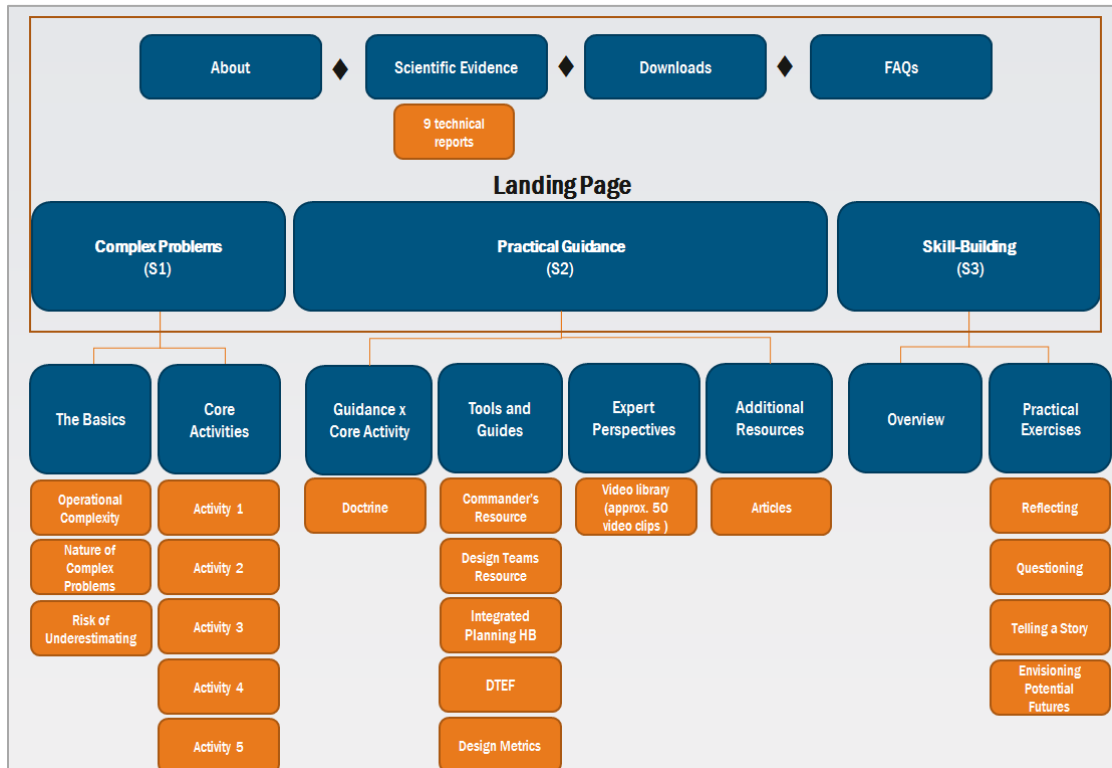


Figure 1. Structural layout of the MCP resource.

Within the complex problems section, topics include the basics of complex problems, and an overview of the five core activities involved in managing complex problems. Within the practical guidance section, content includes practical guidance associated with each of the five core activities and links to previously-developed guides (e.g., a handbook on Integrated Planning, a resource for teams engaged in making sense of complex problems, a resource for commanders on Army Design Methodology, and a handbook on design metrics). The practical guidance section also includes the filterable library of video clips from strategic thinking experts, and a set of downloadable resources that includes literature on topics relevant to managing complex problems. In the skill-building portion of the resource, four skill-building exercises are provided, along with their relevant materials (e.g., facilitator guide, participant guide, supporting slides, exercise materials, and supplemental videos). Exercises include: “Reflecting on Experience,” “Asking Powerful Questions,” “Telling a Story: An Exercise in Connecting the Dots,” and “Envisioning Potential Futures.”

In addition to these three major sections, the website also includes an overview of the MCP resource itself, a place to find research reports that informed the resource content, a place to find frequently asked questions (FAQs), a tab to access downloadable materials, and a tab to

provide feedback on the resource for purposes of continual improvement and refinement. Example screen shots are provided in Appendix G.

Evaluation of the Resource

A total of 7 participants from the intended user population responded to a set of surveys to provide feedback on each of the three MCP resource modules, as well as feedback on the resource as a whole. Overall, findings from both the quantitative and qualitative data were largely positive. Due to small sample size, analyses focused more on themes found in the qualitative responses (see Appendix H for descriptive statistics for Likert-type items).

Participants provided valuable feedback in the open-ended responses regarding conceptual, formatting, and technical aspects of the resource. Overall, participants noted that the resource contained valuable material, was useful for multiple audiences, and the expert videos were seen as credible, valuable, and a good alternative to text-based information. Example comments include:

“Overall content and explanation of complex problems and related definitions was very useful/ helpful. Tools and guides are very useful, as they provide something to reference and look back at down the road.”

“Excellent video library – sometimes it’s better to hear someone explain things in person.”

“I think that officers, warrant officers, and senior NCOs could use this website for self-development. It supplements the doctrinal publications on ADM. Likewise, it can be used as a resource in PME.”

While participants did not express any major concerns regarding **content**, participants did provide some suggestions for content clarification, including expansion on some concepts, and content additions (e.g., more expert videos, examples of complex problems, examples of good physical layouts).

“The examples provided under ‘The Basics’ were not particularly clear and in at least one case appeared to address complicated rather than complex problems. The distinction between those two categories of problem require more explication.”

“Consider providing resources that explain some of the complexities of a particular operational environment. If that might be too sensitive, maybe use a historical example where understanding the operational environment over time led to a better outcome.”

Participants also provided useful recommendations for improving the **overall user experience**. Some feedback suggested that the website was “clunky” in spots, and the amount of text may be overwhelming (e.g., core activities guidance). These concerns may be addressed by implementing changes to the organization and navigation structure of certain sections; for example, text-heavy sections could be re-formatted so that certain text is hidden until the user clicks to read more.

“Overall, it was just a lot of information—the core activities page scrolls for a long time and shows a lot of info. Would be good if this part was more interactive— i.e., click to reveal more info instead of just listing stuff.”

“As a user, once I completed the Overview portion of this module, there was no information guiding me on which of the exercises to get into first. It was only after I chose and opened the first exercise in the arrangement that I saw advice regarding which exercise it would be helpful to do first.”

Some participants experienced **technical issues** with the website, mostly related to hyperlink and video accessibility. It is possible that these issues were related to firewalls and will be remedied with the resource on the CAR server. Further testing will be conducted on this issue prior to ARI marketing the resource publicly. Regarding future technical issues, the proponent should establish a clear process for reporting and managing these issues. This process may involve a site management plan and marketing/communication strategy, for example.

Finally, several participants offered insightful feedback on audiences to target, and reasons why the resource would be useful to them. These suggestions could potentially be integrated into the “Intended Audience” section on the About page.

“All officers could benefit from this resource as early in their career as possible. Select aspects of the resource could be combined to address leaders at different stages of their careers to reinforce critical thinking practices and as an expert resource and link to specific materials.”

“I think anyone whose job responsibilities involve processing complex information in order to make sound decisions to solve problems would benefit from this resource. The more complex and ambiguous the information to be processed before having to draw reasoned conclusions, the more benefit would be derived from a resource like this one.”

Following consolidation of participant feedback, the research team met to discuss potential solutions, prioritization of the potential solutions, and ease of implementation. A list of recommendations, organized by module and type (content, formatting, or technical issues) was generated. Fixes that impact the immediate usability of the site and/or changes that could be made quickly were implemented. Additional changes and improvements will be made to the site in the future.

Discussion

The goal of the MCP resource is to provide Army leaders and other Army personnel with a self-development resource for practical guidance related to managing complex problems, with content derived from ARI’s program of research on design and strategic thinking. The design and development of the resource was focused on presenting findings from the ARI research program in a user-friendly and accessible format. Findings from the evaluation study, along with reviews from the SMEs who participated in expert perspective interviews, suggest evidence of desire and need for this type of resource.

The development of the MCP resource followed a process informed by principles of cognitive systems engineering and user-centered design. The MCP resource incorporates key theoretical and conceptual content into a format that is perceived as easy to use and containing valuable information. The MCP resource is a multimedia website firmly grounded in a program of research-based theory and empirical findings, while also being a useful source of practical information for a large Army audience to help develop Army leaders’ ability to solve complex problems.

Several considerations have been identified throughout this process to ensure the continued success and maximum impact of research insights and leader development resources such as the MCP resource. First, identifying an advocate and developing a communications outreach strategy for the intended audiences are important steps in transitioning a leader development tool. A proponent individual and/or their organization is vital to drive strategic messaging and outreach, to help Army leaders understand the value of the resource, to help disseminate the resource, and to ensure sustainability and upkeep of the resource over time. Proponent outreach will increase the likelihood of significant positive impact of research insights and tools on the Army. For example, recent efforts to promote strategic thinking development in Army leaders have been supported by the identification of the U.S. Army War College as the proponent for strategy education in the Army.

Second, the evaluation yielded multiple opportunities for improvement and expansion of the resource. Recommendations include improving organization and navigability, adding videos on a wider range of topics and from a broader set of SMEs, adding modules based on on-going ARI research studies and other topics. Modifying the organization of the resource and enhancing the interactivity of the resource (particularly with respect to the skill-building exercise portion) are other opportunities for enhancement. A collaborative design session, with multiple perspectives represented, is recommended as a potential next step for taking the resource to the next level.

Finally, the current evaluation was broad and focused on participants' understanding of issues associated with complex problems. In order to gather more substantive feedback and evidence on the resource's usability and utility, a larger, more extensive evaluation study is recommended after improvements have been implemented. This study should include a cognitive skills assessment component, which will likely need to be tied to specific components of the website (e.g., skill-building exercises).

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Appendix A

User Needs Analysis Interview Guides

User Needs Analysis Interview Guide Group 1: Potential resource users

The intent of the interviews is to: gain a better understanding of potential user communities for the to-be-developed design and strategic thinking multimedia resource including,

- Who might use the resource
- How they might use the resource
- The context in which they envision using it
- What information they need and want in the resource
- What their preferences are for how the information in the resource is presented, including the technology platform

Overall structure of interview [2 hours]:

1. Introductions and overview of project [10 min.]
2. Interviewee background [10 min.]
3. Overview of envisioned design and strategic thinking resource, including overview of example existing products [15-20 min.] (note: may want to provide overview of envisioned design and ST resource in a read-ahead as well)
4. Elicit interviewee reactions to overview of envisioned resource, and explore how they could envision using such a resource, what they want/need in a resource like this, and their preferences for information presentation and technology platform [60-80 min.]

(Within 3 and 4, will show interviewees the strategic thinking exercises, the design teams resource, and the commander's resource as examples to elicit reactions and facilitate discussion).

I. Introductions and Overview of Project

Who we are: e.g., ARA, Crandall Consulting, TiER1, ARI, etc.

Background on project: Over the last 4 years, ARI has led a program of research on design and strategic thinking. The program has covered topics including: organizational barriers to design, knowledge skills abilities for design, design team best practices, integrated planning, visualization of complex problems, etc.

[Here we can show them a list of the efforts]

What we are doing in this project is looking across the full set of research findings and products developed in that program and synthesizing the information to develop 2 products: 1) a report

that distills key insights and remaining questions, and 2) a multimedia resource for practical use.

What we'd like to talk with you about today is the multimedia resource. The intent of this resource is to provide practical guidance, tips, and resources to support application of and/or development of design and strategic thinking skills among current and future Army leaders.

What exactly will go into the resource, and what it will look like, are yet to be determined.

We want to make sure that whatever we develop is something that will be useful to the people who may eventually use it. At this point in our work, we are thinking about a couple of main user groups including instructors and their students, combat training center (CTCs) trainers and trainees, and unit commanders and their staffs. That's why we're talking with you today.

We want to understand how we can develop this resource in a way that will provide the most value to you and your students/Soldiers. So we're interested in your thoughts on both content and format. We're also interested in how you envision potentially using this resource.

II. Interviewee Background

- Current position/role
- Responsibilities
- Extent to which they address skills related to design or strategic thinking in their class (or with their unit).
- Experience in operational settings w/ design and strategic thinking (briefly)

III. Overview of envisioned design and strategic thinking resource [5-10 min.]

[Describe preliminary ideas for resource. E.g., practical tips, resources, exercises. Show design teams resource as an example, along with ST exercises, integrated planning handbook, and commander's resource.]

[We will note their questions/comments during this.]

IV. How interviewee could envision using such a resource, what they want/need in the resource, and their preferences for information presentation and technology platform

- How might you use a resource like this? In what context? And in support of what learning/education or staff development goals?
- [If they are an instructor...]. How can you envision your students using a resource like this?
- [If they are a unit commander....] How can you envision the Soldiers in your unit using a resource like this?

- If you cannot envision yourself [or your students, or Soldiers] using a resource like this, why not?
- What other individuals or groups do that you think would benefit from a resource like this?
- What content would you like to see the resource contain relative to design?
- What content would you like to see the resource contain relative to strategic thinking?
- What characteristics should the resource have in order for it to be most useful/valuable to you?
- What do you think the resource should NOT include? Why not?
- How do you want to be able to access the resource? In other words, what technology platform(s) are going to make it most usable/accessible for you?
- If we have video clips as part of this, with expert perspectives offered on certain components of the strategic thinking exercises, what information would you like to see the experts to provide?
- How could you envision using those videos? [Try to understand potential “use cases” for expert perspective videos].
- What else should we keep in mind as we develop this resource to ensure it has the greatest value to you?

V. Wrap up

- Are there other people you recommend we talk to in order to get a sense of what should be included in this resource and what platform it should go on?
- As we develop this resource, we are going to seek feedback from potential users along the way. Would you be willing to review and provide feedback at a later date?
- Any other suggestions you have to help us develop/position the Resource so it benefits the Army?

User Needs Analysis Interview Guide

Group 2: Those who can inform about technology platforms

The intent of the interviews is to: gain insight into how and where we can position the to-be-developed multimedia resource so it provides maximal reach and benefit for current and future Army leaders, including:

- What online portals or other technology platforms exist for housing the multimedia product
- Relative advantages and disadvantages of particular technology platforms.
- What is involved in getting a product placed on a given technology platform
- How to position the product to gain both initial and long-term exposure (e.g., what advice they have about how to introduce the product to Army leaders should people know about it, give it a try, and begin to use it.)

Overall structure of interview [2 hours]:

5. Introductions and overview of project [10 min.]
6. Interviewee background [10 min.]
7. Overview of envisioned design and strategic thinking resource, including overview of example existing products [15-20 min.] (note: may want to provide overview of envisioned design and ST resource in a read-ahead as well)
8. Interviewee overview of options and/or suggestions for where the multimedia resource could be housed for maximal reach and benefit to the Army, and what is required to make that happen [60-80 min.]
9. The constraints and benefits of particular platforms, and associated requirements

(Within 3 and 4, we will show interviewees the strategic thinking exercises, the design teams resource, and the commander's resource as examples to elicit reactions and facilitate discussion).

VI. Introductions and Overview of Project

Who we are: e.g., ARA, Crandall Consulting, TiER1, ARI, etc.

Background on project: Over the last 4 years, ARI has led a program of research on design and strategic thinking. The program has covered topics including: organizational barriers to design, knowledge skills abilities for design, design team best practices, integrated planning, visualization of complex problems, etc.

[Here we can show them a list of the efforts]

What we are going to do in this project is look across the full set of research findings and products developed in that program and synthesize the information to develop 2 products: 1)

a report that distills key insights and remaining questions, and 2) a multimedia resource for practical use by current and future Army leaders.

What we'd like to talk with you about today is the multimedia resource component. The intent of the Resource is to provide practical guidance, tips, and resources to support application of and/or development of design and strategic thinking skills among current and future Army leaders.

What exactly will go into the resource, and what it will look like, are yet to be determined.

We want to make sure that what we develop will be useful to the people who may eventually use it. At this point in our work, we are thinking about several main user groups: instructors, their students, unit commanders, and their staffs. We are talking with a sample from those communities to better understand what they need and what they would like to see in the resource.

In order for the resource to be accessible to the potential user communities, we need to understand what platforms are available for housing a resource like this, who has access to those platforms, what the relative advantages and disadvantages are for using a particular platform, and how a particular platform might influence the content and functionality of the Resource. That is why we are talking with you.

VII. Interviewee Background

- Current position/role
- Responsibilities – particularly those relative to Army training and education.

VIII. Overview of envisioned design and strategic thinking resource [5-10 min.]

[Describe preliminary ideas for resource. E.g., practical tips, resources, exercises. Show design teams resource as an example, along with ST exercises, integrated planning handbook, and commander's Resource.]

[We will note their questions/comments during this.]

IX. Interviewee overview of options and/or suggestions for where the multimedia resource could be housed for maximal reach and benefit to the Army, and what is required to make that happen [60-80 min.]

- What platforms exist for housing a multimedia product like the one we've described?
 - Who tends to access those platforms? And for what purpose?
 - What do you see as the relative advantages and disadvantages of those platforms?
- Given what we've described about the envisioned resource and envisioned audience, what platform do you recommend we use to house the product? And why?
- What does it take to get a product housed on this platform?

- i.e., what are the steps involved? Who oversees the process? How long does the process typically take? Does the platform have technological, formatting, or functionality requirements that we should be thinking about as we develop the Resource? If so, what are they?
- Given what you understand about the Resource, are there platforms that you think would NOT be a good fit and that you would not recommend? And why?
- What else should we be considering to ensure the product we develop has the maximal reach and benefit to current and emerging Army leaders?
- Who else do you recommend we talk to?

Appendix B

Expert Perspective Interview Preparation Guide.

Purpose

The intent of the “expert perspective” interview is to capture your views on strategic thinking and embed them within a multimedia resource under development by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI). The resource is intended to provide Commanders and their Staff with tools, tips, and exercises for design, strategic thinking, and managing complex problems. Interviews with a select set of highly-respected experts will be videotaped, edited, and embedded in the resource as part of a set of strategic thinking exercises. The exercises are intended to give Army leaders the opportunity to practice skills associated with strategic thinking - such as systems thinking, asking powerful questions, reflecting on the environment, and thinking in time. The video clips of you and other experts will be used to augment the exercises and enhance Army leader engagement when participating in the exercises.

What will I need to do prior to the interview?

- At least 1 week prior to the interview, the research team will send you a set of discussion topics and questions for your review and reflection. A sample question might be: *Why is asking good questions important for strategic thinking?*
- We will also provide you with read-ahead materials to familiarize you with the practical exercises that we’d like you to reflect and comment on. Read-aheads will include an overview description of the strategic thinking exercises, including a description of the exercise purpose, learning objectives, and brief tutorial.
- Review of materials and associated questions will require approximately one hour.

What will happen during the interview?

- Two representatives from the research and development team will serve as the interviewers. A videographer will be present to capture the interview.
- The interviewers will ask a question, videotape your response, and then turn off the video camera. We will repeat this process until you are comfortable with the response. Then we will move to the next question.
- The intent will be to create a conversational and relaxed dialogue.

How long will the interview last?

- The interview will last approximately two hours.

Will I be able to review my videos?

- The final product (video/audio and quotes) from your interview will be available for your review and approval prior to embedding them in the resource. We will not embed the videos without your final sign-off.

What should I wear for the interview?

Video/audio equipment tends to be extremely sensitive, so we offer the following dress guidelines for you to consider for the day of your interview:

Military: Uniform of the day.

Men: dark or medium-colored suits, no white shirts (prefer blue), no jittery patterns on ties. Please try to avoid polyester – it tends to make noise when rubbing against the microphone.

Women: solid colored suits/dresses/blouses, no jangling jewelry (simple jewelry is fine). Please try to avoid polyester – it tends to make noise when rubbing against the microphone.

Appendix C

Expert Perspective Interview Guide

Purpose: The intent of the “expert perspective” element of the multimedia resource is to augment the 4 practical strategic thinking exercises by providing expert perspectives on each exercise. We intend to seek input from 3-4 strategic thinking experts.

Within the multimedia resource, the user (facilitator or student) will have the ability to click on video screenshots and listen to what the expert has to say about a given topic.

Duration of the interview: ~3-4 hours, with break at mid-point

Questions:

General

- Please tell us a little about yourself and your background.
- Please describe your perspective on the difference between strategic thinking vs strategic level.
- Please describe for us what you see as the key challenges to thinking strategically – particularly within the Army context.
- Can you describe for us the role of practice in developing strategic thinking ability?
- Can you make a statement about how the component skills (e.g., systems thinking, synthesis, reflection, asking good questions, and thinking in time) are critical to becoming a good strategic thinker.

Reflecting on the Environment

- *Importance/value of the skill*
 - How do you use reflective thinking as part of your work?
 - How does reflective thinking help you?
 - Why is it important to reflect not just *after* events, but before and during events as well?
 - In the exercise, we ask people to practice posing different types of questions. Why is asking a variety of types of questions (what, how, why) so important? And why is it so important to get to the “why”?
 - What do you see as the value of group reflection (over and above individual reflection)?
- *Experience with the skill*
 - Tell us about a time when reflection helped you understand a situation or problem more clearly.
- *What makes it challenging*
 - In your experience, what makes reflection challenging? (particularly in the Army context). What gets in the way?
 - What are some ways to overcome those challenges?
- *Developmental path:*

- How did you develop your skill in reflective practice? Were there specific experiences or assignments that were particularly helpful?
- *Tips/Strategies*
 - What strategies have you used to bring reflective thinking into your work in a regular, ongoing way?

Guidance for Interviewee: Throughout your responses, we'd like you to emphasize and reiterate some of these points: (examples of these specifics will be helpful)

- How reflection supports continuous learning and being a good strategic thinker
- Reflection is an opportunity to identify connections and inter-relationships that might not be otherwise apparent.
- Reflection is important in allowing you to think about what went wrong/right and why, and using that information to be better prepared for future situations.
- Importance of asking varied types of questions that get at *what* happened, *how* it happened, and *why* it happened (getting to why); how asking different types of questions will lead to deeper insight
- Importance of iterative reflection – and reflecting before, during, and after events. Reflection is often thought of as something that happens after-the-fact. But reflection should happen during situations so adjustments can be made.
- Reflection is a *skill* – rather than an aspect of personality that some people have and others do not (e.g. some people like to mull over events; others are action-oriented). Importance of approaching it as a skill, practicing it, figuring out how to embed practice as a regular part of your daily life.

Asking Powerful Questions

- *Importance/value of the skill*
 - Why is the ability to ask powerful questions important for strategic thinking?
 - What does questioning allow people to do/learn?
 - What makes something a 'powerful' (or 'useful') question?
 - Why is it important to engage in broad information searches (consult a wide variety of information sources) to answer those questions?
 - How are the questions you might ask at the tactical/operational level (what/how) different from what you might ask at the strategic level (why, what if, how might...)
- *Experience with the skill*
 - e.g., Tell us about a situation in which asking good questions or gathering information from a wide variety of sources was important for helping you understand a situation or problem more fully.
- *What makes the skill difficult?*
 - In your experience, what makes asking powerful questions difficult?
 - Why do you think people have difficulty coming up with a variety of questions?
 - What makes seeking information from a variety of information sources difficult?
- *Developmental path:*

- What experiences or activities do you think are important for helping Army leaders develop their questioning and information- gathering skills?
- *Tips/Strategies*
 - What strategies have you used to bring questioning into your work in a regular, ongoing way?
- *Other:*
 - [we will give example image(s) to expert]. In order to understand what is going on in the situation shown here, what questions would you ask?
 - [for a given question] What makes that question important?
 - What sorts of information would be important for answering your questions, and where would go to find it?

Guidance for interviewee: Throughout your responses, we'd like you to emphasize and reiterate some of these points: (brief examples will be helpful)

- Reflection on how questions can help to deepen learning, enhance situational understandings, and explore alternative perspectives.
- importance of getting to “strategic level” questions (Why, what if etc)
- Importance of asking a wide variety of questions.
- Importance of using open-ended rather than close-ended questions (and why that is)
- Importance of gathering information from diverse sources
- Idea that (particularly with complex problems) there may not be a ‘right’ answer. How manage that?
- Differences between powerful questions and superficial/weak questions
- Powerful questions are defined by three dimensions: scope, meaning/context, and architecture (see p 13 from newest version of exercise)

Telling a Story

- *Importance/value of the skill*
 - Why are systems thinking and synthesis important skills for strategic thinking? In other words, how does the ability to identify connections across seemingly disparate events or pieces of information...and integrate them into a whole... support strategic thinking?
 - Why does an exercise like this matter? How could it help me?
- *Experience with the skills*
 - Tell us an example of when your systems thinking or synthesis skills were important for understanding a strategic issue or problem? (or, for thinking strategically about a situation)?
- *The challenge of systems thinking*
 - In your experience, what makes systems thinking challenging?
 - What about synthesis, what is difficult/challenging about bringing disparate information together into a coherent whole?
- *Developmental path:*

- How did you develop these skills? Were there particular experiences that were particularly helpful?
- *Tips/Strategies*
 - What strategies do you suggest to help people bring systems thinking and synthesis into their work in a regular, ongoing way?
- *Other:*
 - [We will give SME 5 images]. Please use these 5 images to create a story and sketch. The story should tie all the images together into a coherent whole.

Guidance for interviewee: Throughout their responses, we'd like you to emphasize and reiterate some of these points: (brief examples will be helpful)

- The importance of recognizing connections across factors that are seemingly unrelated, in order to understand complex problems/complex sets of circumstances.
- Factors that might seem unrelated on a superficial level may actually interact in ways that need to be understood in order to effectively anticipate and/or shape future circumstances.
- Also important to be able to adapt one's understanding/explanation when new or different information is introduced or circumstances change

Potential Futures

- How would you describe the skill of strategic foresight – or thinking in time?
- *Importance/value of the skill*
 - Why are thinking in time and strategic foresight important skills for strategic thinking?
 - How does thinking backward in time help strategic foresight?
- *Experience with the skill*
 - Tell us about a situation in which your ability to think in time or use strategic foresight was important for thinking strategically about a problem/issue?
- *What makes the skill difficult?*
 - In your experience, what makes thinking in time or strategic foresight challenging?
- *Developmental path:*
 - What experiences or activities do you think are important for helping Army leaders develop their strategic foresight/thinking in time skills?
- *Tips/Strategies*
 - What helps you move your thinking backward and forward across time? What sorts of things do you pay attention to?
 - What strategies have you used to bring thinking in time and strategic foresight into your work in a regular, ongoing way?
- *Other:* [provide SME a scenario, and ask him/her to think backward and forward in time, and sketch out visual]

Guidance for interviewee: Throughout your responses, we'd like you to emphasize and reiterate some of these points:

- How thinking in time supports being a good strategic thinker
- The importance of understanding historical and contemporary contexts for forecasting possible futures
- The importance of taking a long-term perspective in developing an effective and sustainable strategy
- How thinking in time can help you to avoid unwanted consequences/anticipate second and third order effects

Appendix D

Description of Video Review Process

Step 1: Listen to video and note sound bites that may be useful for putting in resource. Strive for shorter clips – e.g., 30 seconds; note the best portions.

Step 2: Capture the following info for each sound bite and put it in the table below

- Expert name
- Video # (as noted on YouTube site)
- Sound bite identifier (e.g., YouTube timestamp)
- Text from transcript
- At least one of the “descriptor tags” listed on next page (some might have more than one tag)
- Notes (e.g., about placement within exercise – or within resource more broadly; narration that might be needed around it; visual that may be needed, etc).

Tag	Expert	Video #	Sound bite identifier	Text	Notes
(see categories in table below. Can have more than 1 tag)	(Greer, Lodi, McMaster)	(from YouTube site)	(time stamp; e.g., 1:30-1:55)	(Pull from transcript. Use “...” to note text we want to cut out, along with approx. timestamp of cut)	(e.g., about placement in exercise; narration that might need to go around it)

Descriptor Tags

	Tag	Description
General	Background	Expert’s background
	Why is ST important?	Why strategic thinking skills are important for Army leaders
	Diff between ST and strategic level	Difference between strategic thinking and strategic level of war
	Why is practice important?	Role/Importance of practice to build skills associated w/strategic thinking
	Value of exercises	Value of the skill-building exercises (as a set)

Value of each exercise	Value of “Reflecting on the environment” exercise	Why is this exercise valuable
	Value of “Asking Powerful Questions” exercise	Why is this exercise valuable
	Value of “Telling a Story” exercise	Why is this exercise valuable
	Value of “Envisioning Potential Futures” exercise	Why is this exercise valuable
Reflective Thinking	Why is reflective thinking important?	Value/importance of reflective thinking
	Why group reflection?	Value of group reflection (over and above individual reflection)
	Why reflect before and during?	Value of reflecting not just after events, but before and during events as well
	Reflection strategies	How can one bring reflective thinking into their work
Questioning	Why is questioning important?	Value/importance of asking good questions
	Why ask different types of questions?	Why asking different types of questions is important and useful
	What makes a powerful question?	What makes something a ‘powerful’ (or ‘useful’) question
	Tactical and operational vs. strategic-level questions	How are the questions you might ask at the tactical/operational level (what/how) different from what you might ask at the strategic level
	Why is broad information search important?	Value/importance of broad information search (consulting a wide variety of information sources)
	Questioning strategies	How can one bring Questioning into their work
	What questions would an expert ask?	Video of Jim Greer when we gave him example picture and he told us what questions he’d ask
Systems Thinking and Synthesis	Why is systems thinking important?	Value/importance of systems thinking and synthesis
	Systems thinking or synthesis strategies	How can one bring systems thinking or synthesis into their work
	How would an expert tie the information together?	Video of Jim Greer using 5 images to create a story and sketch that ties all the images together into a whole
Strategic Foresight and Thinking in Time	Why is strategic foresight important?	Value/importance of Strategic foresight or thinking in time
	Strategic foresight strategies	How can one bring strategic foresight or thinking in time into their work
Examples	Example or stories	Examples of using the skill from expert’s experience
Other/Misc. useful clips	[create descriptive tag]	Useful sound bites that don’t fit the other tags in this table

Appendix E

Instruction Packet for Evaluation Participants

Managing Complex Problems: Multimedia Product Evaluation

Purpose of the project: The purpose of this project is to perform an evaluation of the “Managing Complex Problems” multimedia resource. Your feedback from this evaluation will be used to inform subsequent changes to the resource that will improve the presentation and organization of content, usability, navigation structure, and overall design. Gathering feedback from those who we expect to use the final product will allow us to better understand how we can improve the product to best serve their needs.

What you will be asked to do in this project: You will be asked to spend time exploring each of the three different modules of the resource. Following each of the three modules you will be asked to answer a set of questions about your experience with that module. Following the last module you will also be asked to fill out a final questionnaire regarding your experience with the resource as a whole.

Voluntary participation: Your participation is voluntary; refusal to participate or discontinuation of participation will result in no penalty or loss of benefits to which you are otherwise entitled.

Confidentiality: Emailing your survey responses will initially link your email address to your responses. However, upon receipt, your responses will be downloaded into an encrypted file and separated from identifying information before data analysis. Once data are analyzed the email and the encrypted file containing the original responses will be deleted. We will not identify you, nor attribute specific responses to you or any other particular participant within this exercise. All responses will be kept confidential and your privacy protected, data will be aggregated and findings will not be reported at the individual level. All data analyses will be conducted only by persons engaged in and for the purpose of this project. We will NOT include your name or the name of your unit, or other personally identifiable information in any report or documents provided outside of the context of this exercise. All data will be stored in an encrypted database, in a safe, locked location within one of the authorized team member’s facilities. Only project personnel who have been officially documented and approved will have access to the data.

We cannot provide "confidentiality" or "nonattribution," to a participant regarding comments involving criminal activity/behavior, or statements that pose a threat to yourself or others.

Time required: Approximately 2 hours.

Risks: There are no risks greater than those encountered in everyday activities. All questions ask about your judgment, views, and experiences regarding this multimedia resource. While there is always a risk of accidental disclosure of your information and data, we have taken every precaution to minimize this risk.

Benefits: There are no direct benefits to you. However, your responses will help our team develop and refine the multimedia resource so that it provides maximal benefit for current and future Army leaders.

Compensation: No compensation is provided for your participation.

WHOM TO CONTACT IF YOU HAVE QUESTIONS ABOUT THE PROJECT: YOU SHOULD SEND YOUR QUESTIONS TO ARI_RES@CONUS.ARMY.MIL. REFERENCE PROJECT NAME: "MANAGING COMPLEX PROBLEMS: MULTIMEDIA PRODUCT EVALUATION."

Whom to contact about your rights in the project or if you incur a project related injury: Contact ARI_RES@conus.army.mil. Reference project name: "Managing Complex Problems: Multimedia Product Evaluation.

If you experience distress or discomfort as a result of your experiences and would like to seek assistance you may contact the Military's 24/7 Resource and Help Center at: Military OneSource: 1-800-342-9647; <https://www.militaryonesource.com>

MC IRB# 17-27(Mod 1) 20Jul17

PLEASE KEEP THIS DOCUMENT FOR YOUR RECORDS

Managing Complex Problems (MCP) Resource: User Evaluation Guide

Overview:

The U.S. Army Research Institute for Behavioral and Social Sciences (ARI) has recently developed the "Managing Complex Problems (MCP) Resource", which is a website containing practical guidance, resources, and skill-building exercises to support Army leaders in managing complex problems in operational settings. The MCP resource is organized into three modules where users can 1) learn about complexity in operational settings 2) find guidance and expert perspectives to support complex problem-solving activities, and 3) find practical exercises for building advanced cognitive skills.

Need for User Feedback:

To ensure that the MCP resource is useful and user-friendly, the ARI team is gathering feedback from potential users. You have been identified as someone with valuable insight on the topics within the Resource. The feedback you provide will be used to inform targeted revisions that will improve the presentation and organization of content, usability, navigation, and overall design of the website.

What we're asking you to do:

For this review, we will ask you to explore each of the website's three modules and provide feedback. We ask that you explore each module freely – read content, view graphics, and navigate through the links as if you would on your own. We will ask you to complete a total of 4 surveys: one at the end of each module, and one at the end for the full resource. Survey questions will pertain to navigation, design, and usefulness of the content, and suggestions that you have for improvement of the resource. We will ask you to send your responses to Dr. Brigid Lynn via encrypted email at brigid.m.lynn.civ@mail.mil.

Given the amount of material on the website, we realize that you may not be able to read each section in its entirety. However, there are specific areas within each module that we would like you to review – these areas are indicated in the instructions on the next page.

Time required:

We estimate the entire review will take you approximately 2 hours. While we ask that you complete the review within a week, you may work on this at your own pace. You may use your own laptop or desktop to complete this review (please do not use a mobile device).

How to get started:

The table on the next page provides step-by-step review instructions, including all necessary links. Use it as your guide.

If you have any comments or questions regarding this review, please feel free to contact Anna Grome at agrome@tier1performancesolutions.com or Dawn Laufersweiler at dlaufersweiler@ara.com.

Thank you for taking the time to complete this review. We greatly appreciate your feedback!

Step-by-step Instructions

Step	Instructions	Screenshot	Estimated time
1. Access MCP Resource	<ul style="list-style-type: none"> Navigate to the following link: http://aratsg.com/public/strategic_dev/ Explore the Home Page and top menu pages (About, Supporting Science, Downloads, FAQs) 		5 min.
2. Explore Module 1	<ul style="list-style-type: none"> Navigate to: “Complex Problems: The Basics” Explore the page Navigate to “Managing Complex Problems: Core Activities” Explore the page 		10 min.

3. Complete 1st Survey

- Open and complete “MCP Evaluation Survey #1 of 4”

Evaluation Survey #1

Please complete the following information about your background.

Current Role: _____

Organizational Affiliation: _____

Check all that apply:

Active duty
 Retired
 Civilian

Years of Service: _____

Current Rank (if Active Duty): _____

Rank when retired from service: _____

5 min.

4. Explore Module 2

- Navigate to: **“Practical Guidance”**
- Explore the 4 sections in this module
 - Core activities
 - Tools and guides
 - Expert perspectives: videos
 - Additional resources
- Review at least 2 videos



20-30 min.

5. Complete 2nd Survey

- Open and complete “MCP Evaluation Survey #2 of 4”

**Evaluation Survey #2
Module 2 (Practical Guidance)**

We are interested in your thoughts on the module you just explored. Below is a set of statements about the second module. Please read each statement and indicate the extent to which you agree or disagree with it on a scale of 1 to 5 (strongly disagree to strongly agree).

1 = strongly disagree (SD)	2 = disagree (D)	3 = neither agree nor disagree (N)	4 = agree (A)	5 = strongly agree (SA)	
	SD	D	N	A	SA
1. I think that I would use this module.					
2. I thought this module was easy to navigate.					
3. I found the various components in this module were well					

5 min.

- 6. Explore Module 3**
- Navigate to: **“Building Thinking Skills”**
 - Explore content in this module, including:
 - Overview
 - Practical Exercises
 - View materials associated with at least 1 of the 4 practical exercises.



20-30 min.

- 7. Complete 3rd Survey**
- Open and complete “MCP Evaluation Survey #3 of 4”

**Evaluation Survey #3:
Module 3 (Building Thinking Skills)**

We are interested in your thoughts on the module you just explored. Below is a set of statements about the third module. Please read each statement and indicate the extent to which you agree or disagree with it on a scale of 1 to 5 (strongly disagree to strongly agree).

1 = strongly disagree (SD)	2 = disagree (D)	3 = neither agree nor disagree (N)	4 = agree (A)	5 = strongly agree (SA)	
	SD	D	N	A	SA
1. I think that I would use this module.					
2. I thought this module was easy to navigate.					
3. I found the various components in this module were well integrated.					
4. I found this module cumbersome/awkward to use.					
5. The way the information in this module is organized makes					

5 min.

- 8. Complete 4th and Final Survey**
- Open and complete “MCP Evaluation Survey #4 of 4”

**Evaluation Survey #4:
Global - Full MCP Resource**

We are interested in your thoughts on the full resource you just explored.

1. Who do you think would benefit from this resource? and when?
2. What other content do you think would be useful to include?

10 min.

- 9. Save and Send Surveys**
- Following completion of the final survey, please email all 4 surveys to Dr. Brigid Lynn via encrypted email at brigid.m.lynn.civ@mail.mil.

5 min.

Appendix F
MCP Evaluation Survey

Background

Please complete the following information about your background.

Current Role: _____

Organizational Affiliation: _____

Check all that apply:

- Active duty
- Retired
- Civilian

Years of Service: _____

Current Rank (if Active Duty): _____

Rank when retired from service: _____

Survey #1

Module 1 (Complex Problems)

Survey #1

Module 1 (Complex Problems)

We are interested in your thoughts on the module you just explored. Below is a set of statements about the first module. Please read each statement and indicate the extent to which you agree or disagree with it on a scale of 1 to 5 (strongly disagree to strongly agree).

1 = strongly disagree (SD)

2 = disagree (D)

3 = neither agree nor disagree (N)

4 = agree (A)

5 = strongly agree (SA)

	1	2	3	4	5
1. I think that I would use this module.					
2. I thought this module was easy to navigate.					
3. I found the various components in this module were well integrated.					
4. I found this module cumbersome/awkward to use.					
5. The way the information in this module is organized makes sense.					
6. After reviewing this module, I have a better understanding of what complex problems are.					
7. After reviewing this module, I have a better understanding of the main activities involved in managing complex problems.					
8. After reviewing this module, I understand the risks of underestimating operational complexity.					
9. After reviewing this module, I appreciate the importance of learning how to manage complex problems.					
10. I doubt I will use this module (either personally or with my unit).					
11. The content in this module is relevant to operational settings.					
12. The material in this module will help me with my work.					
13. The material in this module is engaging.					

Survey #1 continued on next page →

Survey #2

Module 2 (Practical Guidance)

Survey #2

Module 2 (Practical Guidance)

We are interested in your thoughts on the module you just explored. Below is a set of statements about the second module. Please read each statement and indicate the extent to which you agree or disagree with it on a scale of 1 to 5 (strongly disagree to strongly agree).

1 = strongly disagree (SD)	2 = disagree (D)	3 = neither agree nor disagree (N)	4 = agree (A)	5 = strongly agree (SA)
1 2 3 4 5				
1. I think that I would use this module.				
2. I thought this module was easy to navigate.				
3. I found the various components in this module were well integrated.				
4. I found this module cumbersome/awkward to use.				
5. The way the information in this module is organized makes sense.				
6. This module provides useful guidance for managing complex problems.				
7. This module is a useful supplement to doctrine on Army Design Methodology (ADM).				
8. This module is a useful supplement to doctrine on MDMP.				
9. I could see myself using the guidance contained in this module.				
10. The content in this module is relevant to operational settings.				
11. I doubt I will use this module (either personally or with my unit).				
12. After reviewing this module, I have a better understanding of how to manage complex problems.				
13. The expert perspective videos are a valuable supplement to the information in this module.				
14. The material in this module will help me with my work.				
15. The material in this module is engaging.				

Survey #2 continued on next page →

Survey #2 (contd.)

Thank you for answering the preceding questionnaire. Now, please consider each of the following questions and write or type your responses. Please provide as much detail as you would like.

1. What aspects of the module did you find particularly useful? How are they useful?

2. What aspects of the module did you find not useful? Explain why you didn't find these aspects useful.

3. What other thoughts or reactions to this module would you like to share?

Survey #3

Module 3 (Building Thinking Skills)

Survey #3

Module 3 (Building Thinking Skills)

We are interested in your thoughts on the module you just explored. Below is a set of statements about the third module. Please read each statement and indicate the extent to which you agree or disagree with it on a scale of 1 to 5 (strongly disagree to strongly agree).

1 = strongly disagree (SD)
 2 = disagree (D)
 3 = neither agree nor disagree (N)
 4 = agree (A)
 5 = strongly agree (SA)

	1	2	3	4	5
1. I think that I would use this module.					
2. I thought this module was easy to navigate.					
3. I found the various components in this module were well integrated.					
4. I found this module cumbersome/awkward to use.					
5. The way the information in this module is organized makes sense.					
6. I could see myself using the exercises in this module.					
7. I think these exercises would be useful for building thinking skills.					
8. The materials provided for the exercises are user-friendly.					
9. The expert perspective videos are valuable supplements to the exercises.					
10. The content in this module is relevant to operational settings.					
11. I doubt I will use this module (either personally or with my unit).					
12. The material in this module is relevant to my work.					
13. The material in this module is engaging.					

Survey #3 continued on next page →

Survey #4

Global

Survey #4 (Final)

Global - Full MCP Resource

We are interested in your thoughts on the full resource you just explored.

1. Who do you think would benefit from this resource? and when?
2. What other content do you think would be useful to include?
3. What suggestions do you have for improving this resource?
4. What other feedback do you have?

Your responses will help us to improve the resource.
We appreciate your time and input!

Appendix G

Example screen shots from the MCP Resource.



Figure 2. Managing Complex Problems Home Page.

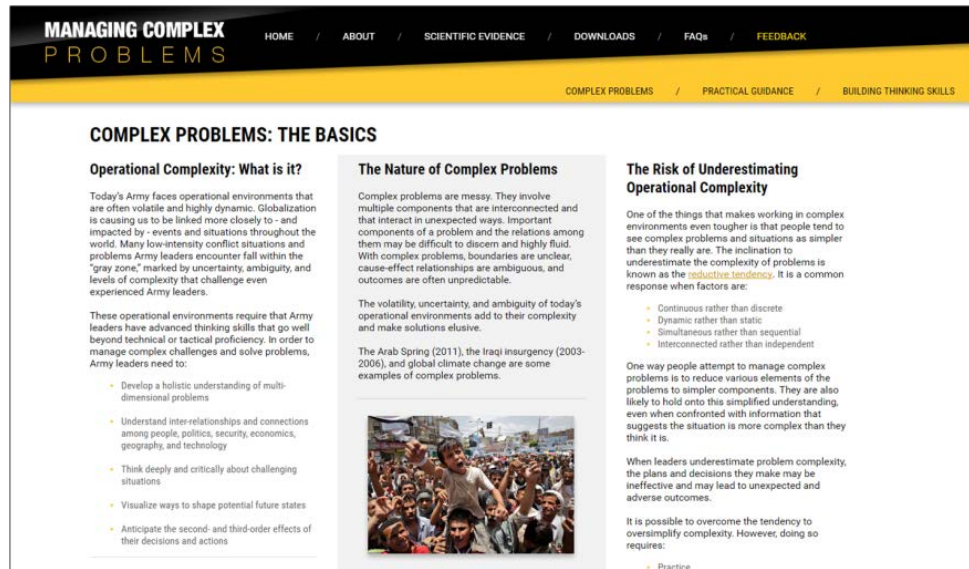


Figure 3. Section of resource entitled, "Complex Problems: The Basics".

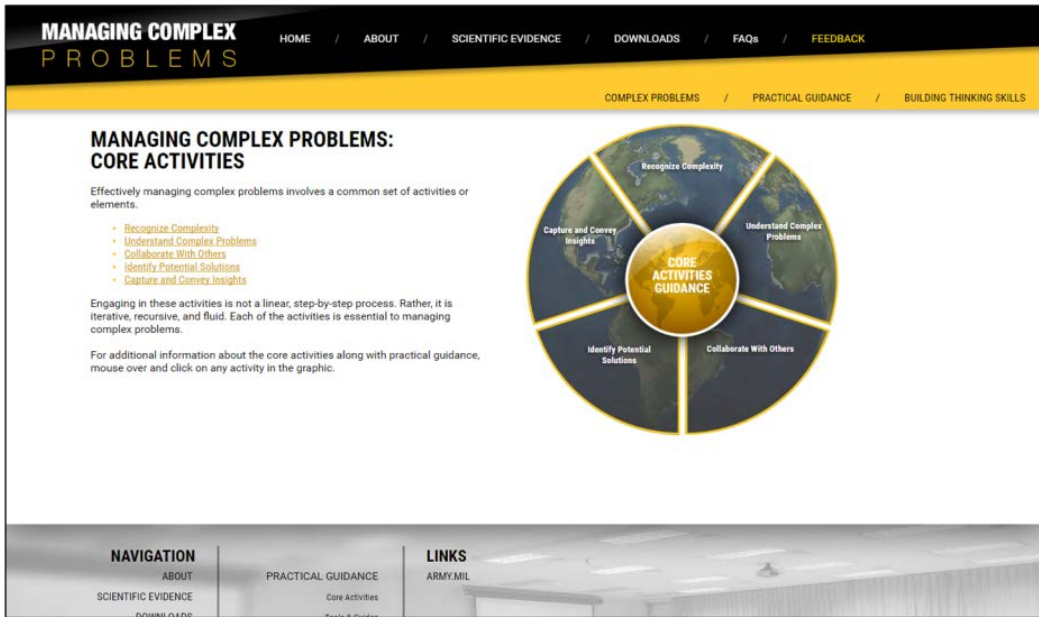


Figure 4. Section of resource entitled, “Managing Complex Problems: Core Activities”.

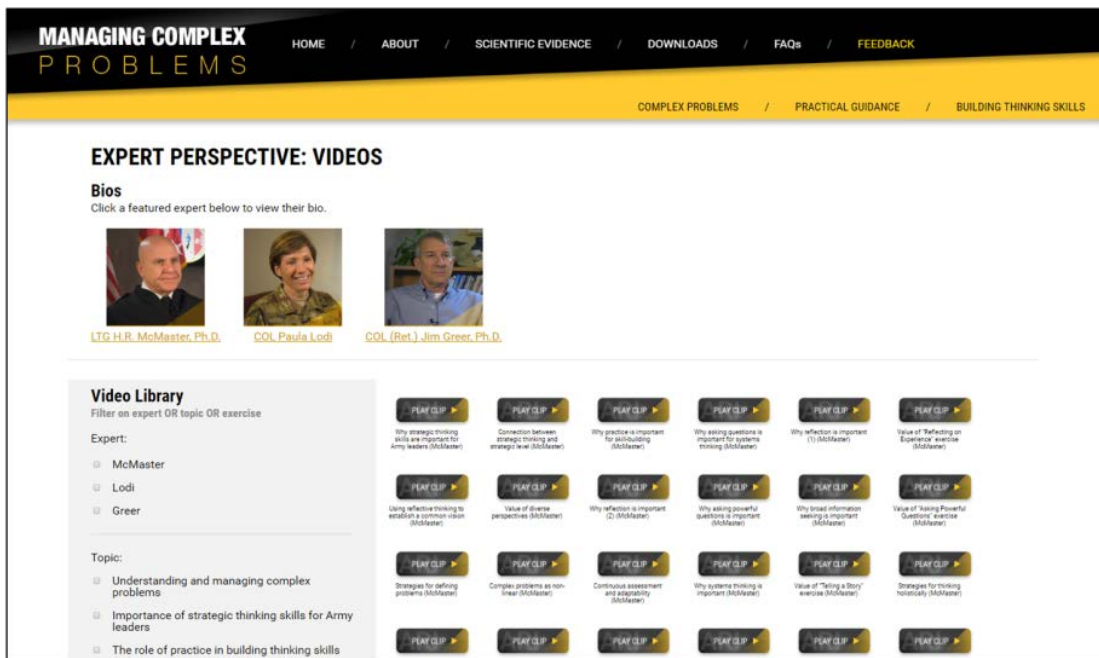


Figure 5. Expert Perspective Video library.

MANAGING COMPLEX PROBLEMS HOME / ABOUT / SCIENTIFIC EVIDENCE / DOWNLOADS / FAQs / FEEDBACK

COMPLEX PROBLEMS / PRACTICAL GUIDANCE / BUILDING THINKING SKILLS

BUILDING THINKING SKILLS: PRACTICAL EXERCISES

Before Army leaders can be ready to step into positions that require them to manage complex problems, they need to hone the advanced thinking skills that managing complexity requires.

Professional basketball players don't just play a lot of basketball. They practice component skills: ball-handling, shooting baskets, rebounding, footwork, speed, and endurance. Anyone who plays basketball at advanced levels has been running drills and honing these individual skills for many years. Developing one's complex problem solving abilities is no different. It requires time, practice, and attention to foundational skills.

The skills that are covered in these skill-building exercises help individuals gain practice in the skills needed for complex problem solving.

What are some core skills needed for complex problem-solving? -

Research has identified a set of core skills and characteristics important for adaptive and strategic thinking and complex problem-solving. They include:

- asking good questions
- collecting information from a variety of sources
- recognizing how people, events, and actions are connected and influence each other
- thinking ahead and anticipating potential problems or alternative future circumstances
- communicating your understanding of problems to others
- reflecting on events to learn from them

Who will benefit from these exercises? +




Figure 6. Section of resource entitled, “Building Thinking Skills: Practical Exercises”.

Appendix H

Evaluation Descriptive Statistics for Likert-Type Item Evaluation Survey Results (N=7)

	Mean	StDev	Min	Max
Module 1				
I think that I would use this module.	4.14	.38	4	5
I thought this module was easy to navigate.	3.86	.69	3	5
I found the various components in this module were well integrated.	4.29	.49	4	5
I found this module cumbersome/awkward to use. (R)	2.00	.82	1	3
The way the information in this module is organized makes sense.	4.14	.38	4	5
After reviewing this module, I have a better understanding of what complex problems are.	4.29	.95	3	5
After reviewing this module, I have a better understanding of the main activities involved in managing complex problems.	4.00	.82	3	5
After reviewing this module, I understand the risks of underestimating operational complexity.	4.00	.58	3	5
I doubt I will use this module (either personally or with my unit). (R)	2.14	1.21	1	4
The content in this module is relevant to operational settings.	4.43	.53	4	5
The material in this module will help me with my work.	4.43	.53	4	5
The material in this module is engaging.	4.00	.82	3	5
Module 2				
I think that I would use this module.	4.29	.49	4	5
I thought this module was easy to navigate.	4.00	.89	3	5
I found the various components in this module were well integrated.	3.86	.69	3	5
I found this module cumbersome/awkward to use. (R)	2.43	1.27	1	4
The way the information in this module is organized makes sense.	4.00	.58	3	5
This module provides useful guidance for managing complex problems.	4.57	.53	4	5
This module is a useful supplement to doctrine on Army Design Methodology (ADM).	4.29	.49	4	5
This module is a useful supplement to doctrine on MDMP.	3.71	1.11	2	5
I could see myself using the guidance contained in this module.	4.43	.53	4	5
The content in this module is relevant to operational settings.	4.14	.69	3	5
I doubt I will use this module (either personally or with my unit). (R)	1.71	.76	1	3
After reviewing this module, I have a better understanding of how to manage complex problems.	4.00	.82	3	5
The expert perspective videos are a valuable supplement to the information in this module.	4.43	.53	4	5
The material in this module will help me with my work.	4.14	.69	3	5
The material in this module is engaging.	4.14	.69	3	5
Module 3 (N=6)				
I think that I would use this module.	4.50	.55	4	5
I thought this module was easy to navigate.	4.00	.89	3	5
I found the various components in this module were well integrated.	3.80	.84	3	5
I found this module cumbersome/awkward to use. (R)	1.83	.75	1	3

The way the information in this module is organized makes sense.	3.83	.75	3	5
I could see myself using the exercises in this module.	4.17	.75	3	5
I think these exercises would be useful for building thinking skills.	4.50	.55	4	5
The materials provided for the exercises are user-friendly.	3.67	.52	3	4
The expert perspective videos are valuable supplements to the exercises.	4.00	.63	3	5
The content in this module is relevant to operational settings.	4.00	.63	3	5
I doubt I will use this module (either personally or with my unit).	1.67	.82	1	3
The material in this module is relevant to my work.	4.50	.55	4	5
The material in this module is engaging.	4.17	.41	4	5