

WELCOME!

*Faculty & Graduate Student
Workshop for Army Research
Institute BAA Research Areas*

Welcome

Run of Show

- 1200 - 1215 Introductory remarks – **Dr. Neal Kingston**
- 1215 - 1245 ARI – Foundational Science Research Unit (6.1) research interests and ARI overview – **Dr. Stefanie Shaughnessy**
- 1245 - 1315 Army Research Institute (Fort Leavenworth) – Fort Leavenworth Research Unit (6.2) priority interests – **Dr. Rhett Graves**
- 1315 - 1325 Army University research interests & ways to collaborate – **Dr. Sena Garven**
- 1325 - 1335 Center for Army Leadership research interests & ways to collaborate – **Dr. Melissa Wolfe**
- 1335 - 1345 Army War College research interests & ways to collaborate – **Dr. Allison Abbe**
- 1345 - 1400 Consortium Fellows Research Program – **Dr. Stefanie Shaughnessy**
- 1400 - 1405 KU C3BE overview – **Dr. Angie Karrasch**
- 1405 - 1500 Q & A and individual faculty & graduate student discussions / breakouts
- Breakout 1 – Dr. Stefanie Shaughnessy (Foundation Science Research Unit and CFRP)
 - Breakout 2 – Dr. Rhett Graves (Army Research Institute, Fort Leavenworth)
 - Breakout 3 – Dr. Kingsley “KC” Ejiogu (Army Research Institute, Fort Leavenworth)
 - Breakout 4 – Dr. Melissa Wolfe (Center for Army Leadership, Fort Leavenworth)



Dr. Neal Kingston

Opening Remarks



Dr. Stefanie Shaughnessy

*Overview of ARI and Foundational Science
Research Unit (Fort Leavenworth)*

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ARI's Basic Research Program

6 NOV 2023

Dr. Stefanie Plemmons Shaughnessy
Chief, Foundational Science Research Unit
stefanie.p.shaughnessy.civ@army.mil



U.S. Army Research Institute for the
Behavioral and Social Sciences



MISSION: Drive scientific innovation to enable the Army to acquire, develop, employ, and retain professional Soldiers and enhance personnel readiness.

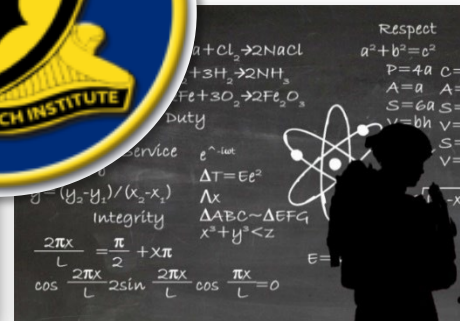
Personnel Assessment

Innovative measures and methods to reduce attrition and maximize personnel and unit readiness of the Future Army.



Team Effectiveness

Innovative assignment and development methods to maximize team and squad readiness for the future battlefield.



Leader Development

Novel methods to accelerate leader development of critical competencies for Multi-domain Operations.

Basic Research

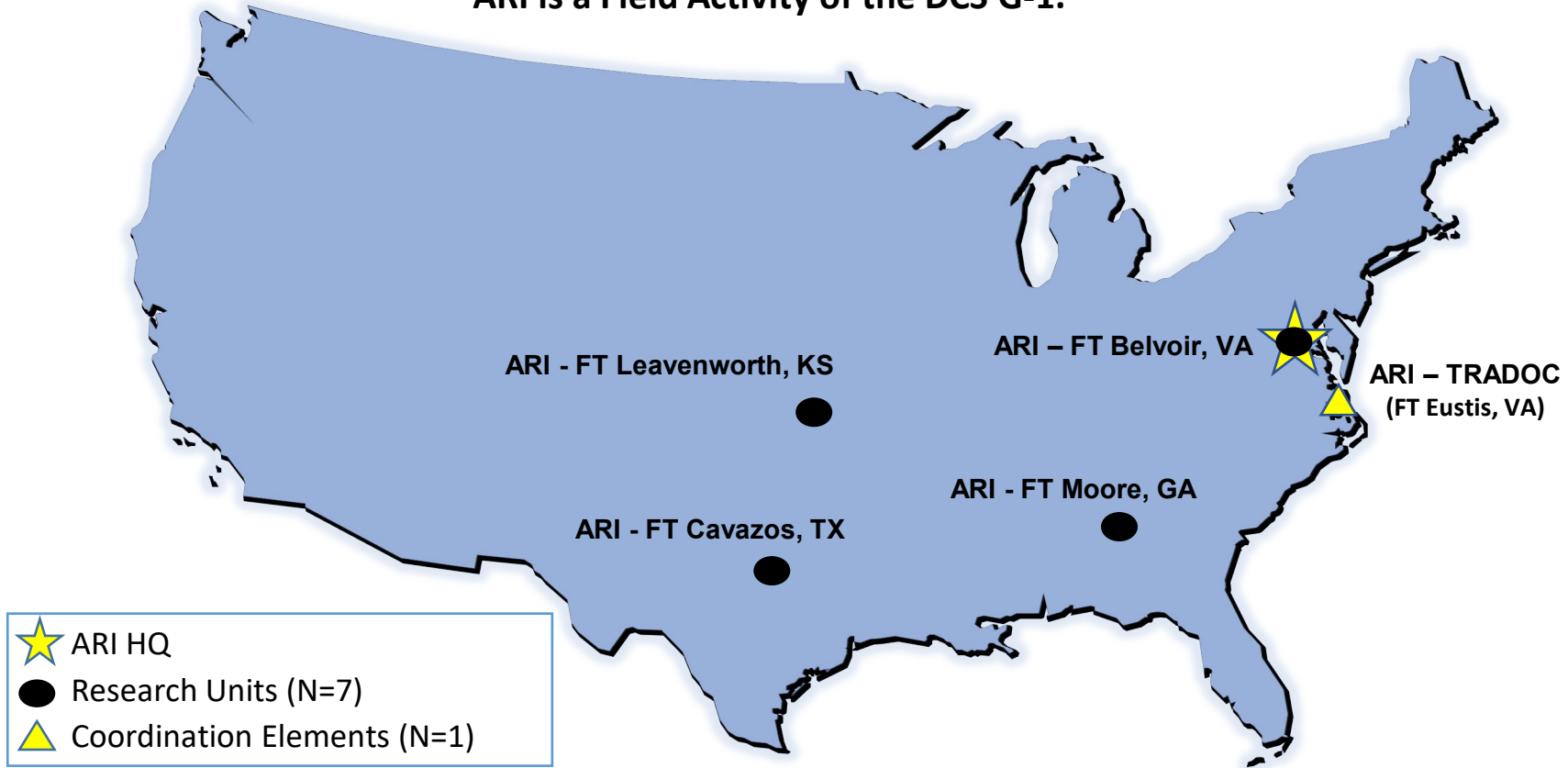
Fundamental theories and new domains in behavioral and social sciences with high potential impact on Army issues.

WHERE PERSONNEL SCIENCE MEETS PERSONNEL PRACTICE

ARI Locations



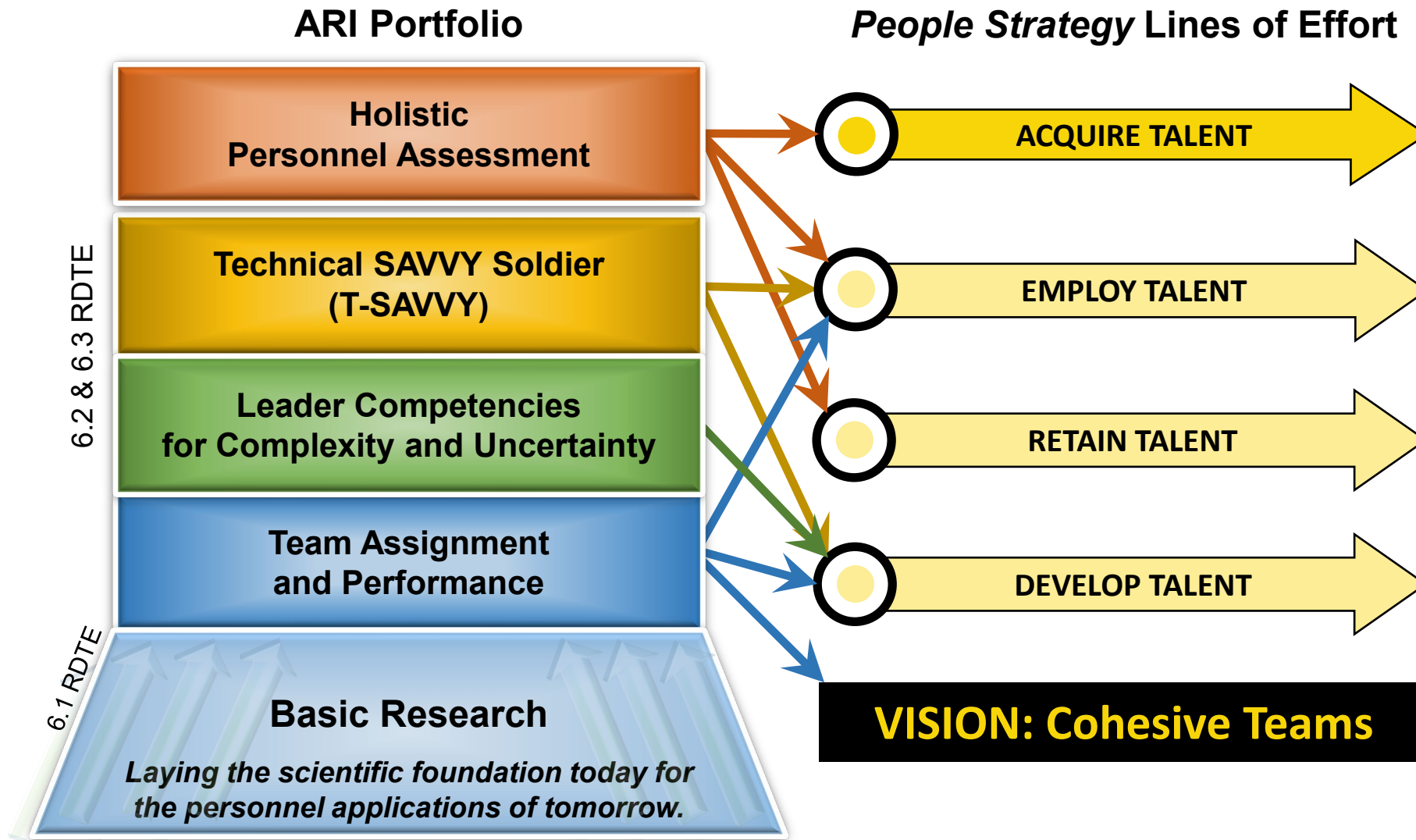
ARI is a Field Activity of the DCS G-1.



ARI's scientific research lineage is traced to 5 AUG 1917 with the establishment of the Committee on Classification of Personnel in the Army, the Adjutant General's Office.

ARI's organizational lineage is traced to 1 JUL 1940 with the establishment of the Personnel Research Section, the Adjutant General's Office.

ARI Portfolio Structure



ARI's Applied Research Programs



Holistic Personnel Assessment



- Provides validated non-cognitive (personality & interest) measures, criterion metrics, and compensatory models to more fully assess potential and better predict performance, conduct, attitudes, and resilience to allow for enhanced talent management. Creates innovations in test development and job analytic methods.
- *People Strategy* LOEs: Acquire, Employ, Retain

Leader Competencies for Complexity & Uncertainty



- Provides effective methods to develop, assess, and accelerate the acquisition of competencies across the Soldier lifecycle – particularly those required to execute multi-domain operations in the future operational environment.
- *People Strategy* LOEs: Develop

Team Assignment and Performance



- Provides team-based personnel management approaches for optimally assigning personnel to small units, enabling units to build, sustain, and assess in-garrison effectiveness and overall mission performance.
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Technical-SAVVY Soldier (T-SAVVY)



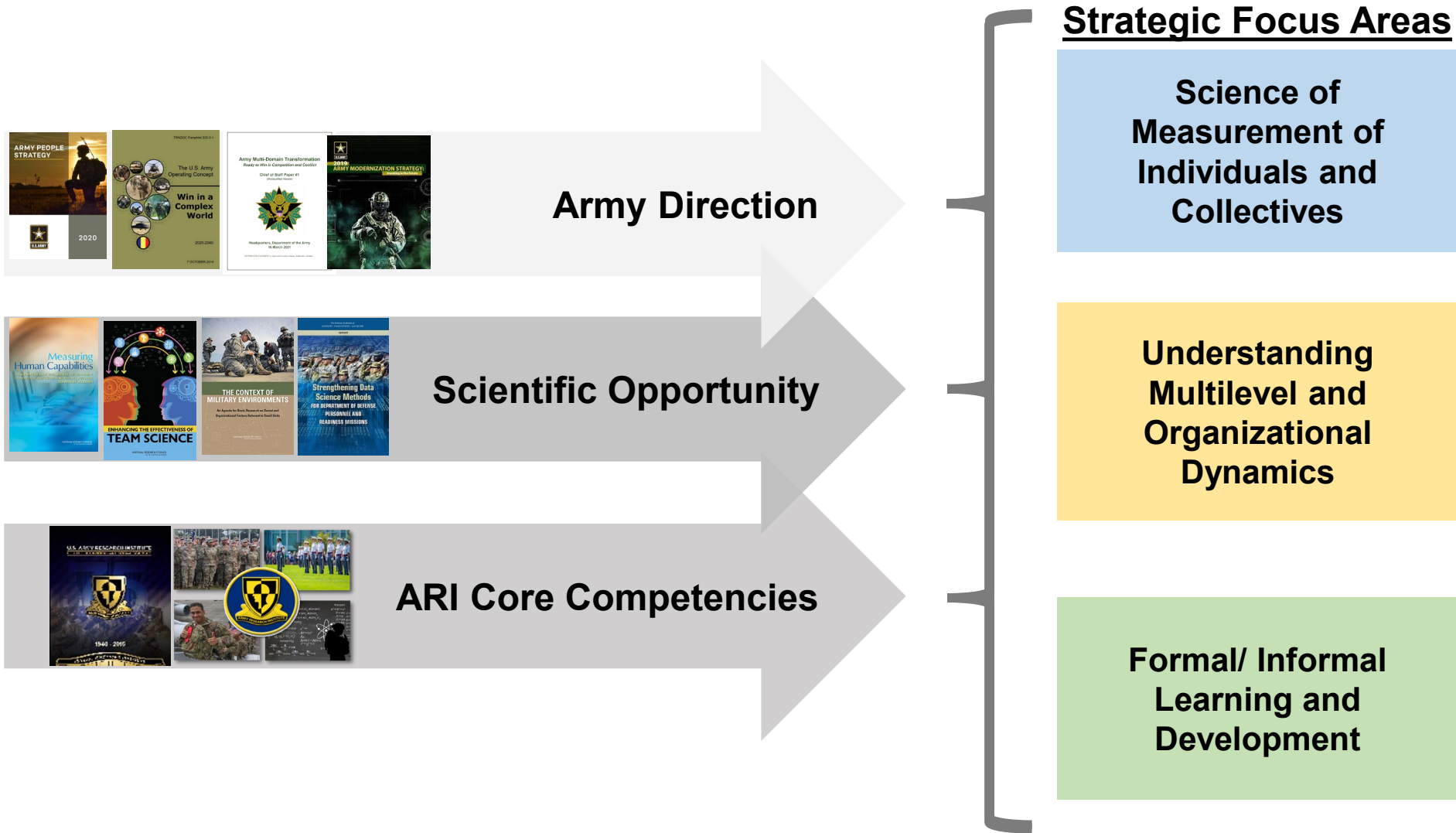
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The mission of the Basic Research Program is:

Execute high-risk, high-reward foundational research to develop state-of-the-art theory, methods, and models to create the innovative concepts required to support the Army's future capabilities and needs related to personnel readiness.



Basic Research Strategic Direction



Basic Research Area Goals



Science of Measurement of Individuals and Collectives

Advanced psychometric theory for deriving valid measurements from complex assessments and continuous streams of data

Understanding Multilevel and Organizational Dynamics

Multilevel theory and methods for understanding dynamic restructuring, coordination, and composition processes in complex organizations

Formal/ Informal Learning and Development

Holistic models of individual and collective learning across work settings and contexts throughout the career span

Extramural Basic Research Program Cycle

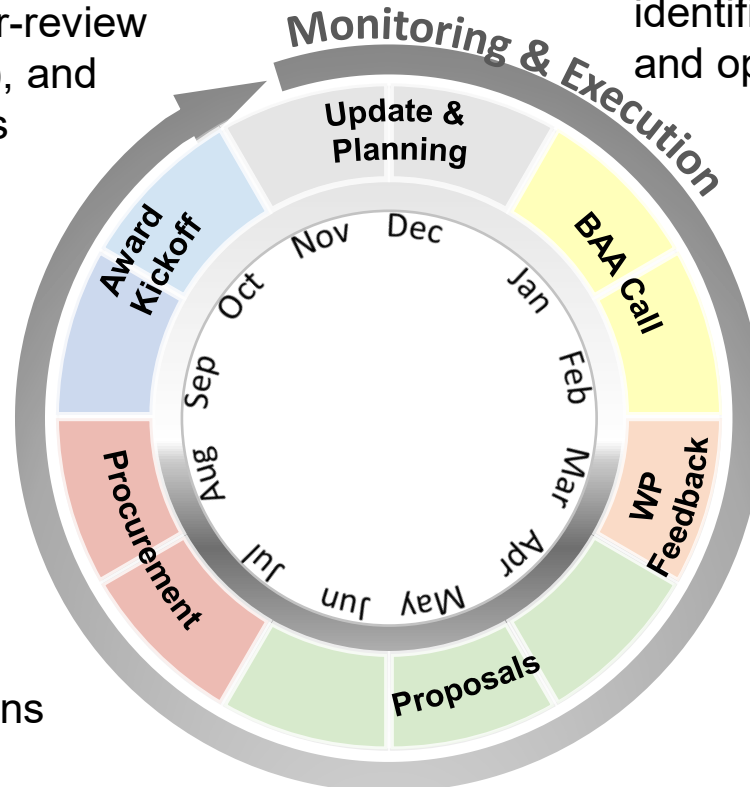


Monitor execution to maintain high quality research activities, reporting (official reports, peer-review journal articles, etc.), and fiscal responsibilities

Ensure BAA integrates Army and ARI mid- and long-term scientific needs through identification of scientific gaps and opportunities

Discuss research portfolios with potential PIs to ensure alignment with key scientific objectives

Disseminate decisions to PIs; assign ARI GOR/CAM to support execution of research, reporting, and fiscal responsibilities



Review and provide constructive feedback to improve scientific quality, technical approach, and alignment with Army and ARI mid- and long-term scientific needs

Complete evaluations using criteria focused on scientific alignment, innovation, technical approach, impact on science, and cost; recommend high-reward, high-risk research for award

Types of Extramural Proposals



Standard Proposals

- Typical performance period: 3 years
- Mean total award: approx. \$750k

Early Career Proposals

- Purpose: To foster the development of innovative and creative researchers
- Eligibility: PIs who are early in their research careers (<5 years from PhD) and have never received ARI funding as PI
- Typical performance period: 12 months
- Typical budget: approx. \$110k

Short-Term Innovative Research (STIR) Proposals

- New form of award for ARI
- Purpose: To support rapid, short-term investigations that assess the merit of innovative new concepts
- Performance period: 1 year
- Budget: no more than \$60k

Science of Measurement



The U.S. Army needs to place the right Soldier, in the right job, at the right time. Trends purports that this will require more efficient measurement of individuals and collectives, a greater understanding of multi-point or continuous requirements, and means/methods to collect and analyze myriad data points to best inform personnel decisions.



Strategic Goal: To fundamentally improve psychological testing and measurement by deriving means to assess multiple constructs and increasing overall precision, understanding, and prediction of individual and collective behavior and performance.

Research Objectives

Understand Time and Dynamic Relationships

Theories that incorporate both inter- and intra-individual change and change within collectives

Expand Measurement Approaches

Assessments of individual and collective attributes and performance

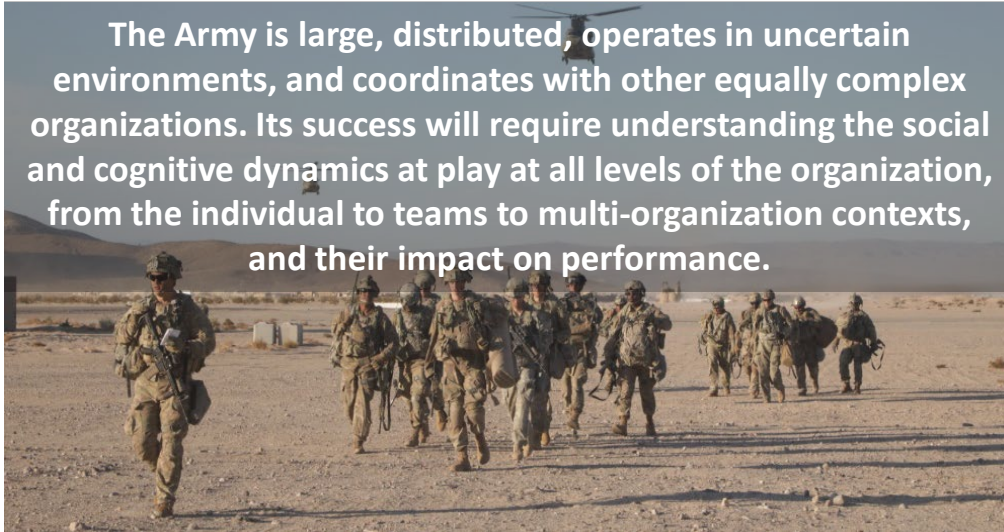
Advance Psychometric Theory and Methods

Psychometrics for complex data types

Multilevel & Organizational Dynamics



The Army is large, distributed, operates in uncertain environments, and coordinates with other equally complex organizations. Its success will require understanding the social and cognitive dynamics at play at all levels of the organization, from the individual to teams to multi-organization contexts, and their impact on performance.



Strategic Goal: To further science to support team optimization reflective of emerging requirements and characteristics of teams and to identify means to leverage methods and models of organizational functioning to effect deliberate intentional sustained systemic outcomes.

Research Objectives

Advance Multilevel Structures of Organizations

Models representing the multilevel nature and interconnectedness of organizations and performance-related cognitive and social factors

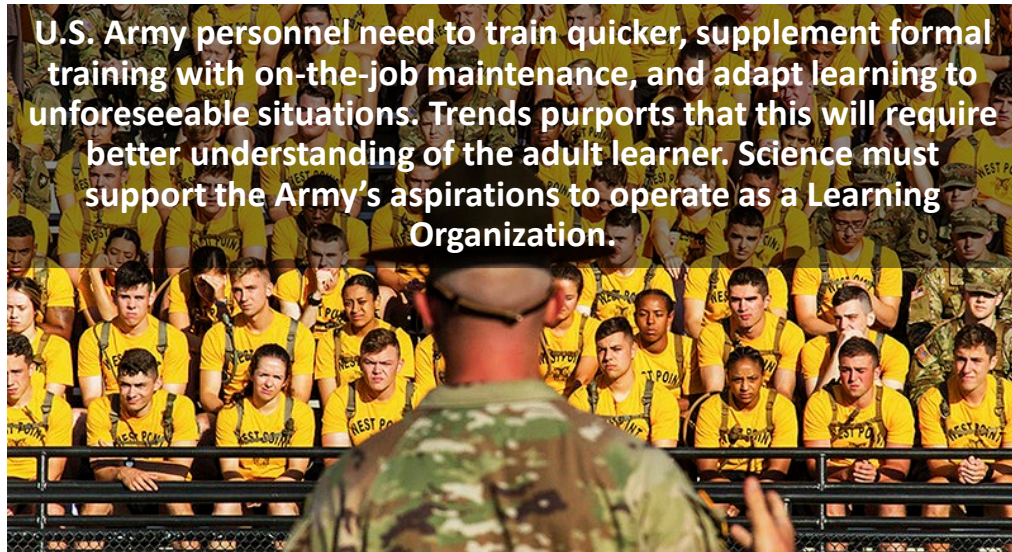
Understand Organizational Dynamics

Complexity-oriented and networks-based models of organizational functioning

Expand Models of Team Functioning

Improve theory related to team constructs, to include team formation and maintenance processes and systems models of composition

Learning & Development



U.S. Army personnel need to train quicker, supplement formal training with on-the-job maintenance, and adapt learning to unforeseeable situations. Trends purports that this will require better understanding of the adult learner. Science must support the Army's aspirations to operate as a Learning Organization.

Strategic Goal: To fundamentally understand, support, and optimize learning and development of Army personnel through both formal learning methods, operational experience, and self-development.

Research Objectives

Measure and Model Learning

Non-obtrusive measures to assess continuous learning and development

Understand Adult and Career-Long Learning

Tested and validated best practices for facilitating and evaluating adult learning

Support Organizational Learning Aspirations

Characteristics, models, and procedures for understanding individual and collective learning



Consortium Research Fellows Program

Graduate Research Fellow Opportunities



Consortium Research Fellows Program

- **Purpose & History**
 - Agreement has been in place with the Army Research Institute since 1982, and other research agencies (DOD, Navy, Air Force) since the 1990s.
 - The Consortium Research Fellows Program (CRFP) serves 19 member universities and organizations of the Consortium of Universities of the Washington Metropolitan Area. The CRFP recruits and hires students, post-doctoral fellows, and professors from any accredited university across the U.S.
- Provides educationally relevant, well-paid professional experiences and mentoring for students
- Provides research opportunities for Post-Docs and faculty
- Provides high-quality technical and analytical support to sponsoring agencies (e.g., ARI, DTAC, AFRL)
- Helps ensure that recent scientific advances in academia are brought into defense awareness and planning

Graduate Research Fellow Opportunities



Consortium Research Fellows Program

- **Assistant Research Fellows (Undergraduate Students)**
 - 20 hours/week (academic year); 40 hours/week (breaks)
- **Associate Research Fellows (Pre-ABD Graduate Students)**
 - 20 hours/week (academic year); 40 hours/week (breaks)
- **Doctoral Research Fellows (ABD Graduate Students)**
 - 30 hours/week (academic year); 40 hours/week (breaks)
 - Healthcare benefits
 - Nominal relocation benefit
- **Post-Doctoral Fellows (New PhDs)**
 - 1-3 year appointment
 - Earned PhD within 2 years of appointment as Post-Doc
 - Compensation equal to GS-12 step 1 for appointment location (includes full benefits)

Graduate Research Fellow Opportunities



Consortium Research Fellows Program

- **Student & Post-Doc Eligibility:**
 - Must be a U.S. citizen
 - Must pass DoD background check
 - Must be students in good standing enrolled in degree-granting programs at institutions of higher learning (student Fellows)
 - Must have at least one calendar year remaining in school and commit to a minimum of one year in the fellowship (student Fellows)
 - Must live or be willing to relocate within commuting distance of the work site
- **How to Apply**
 - Visit www.consortium-research-fellows.org to learn more about the CRFP.
 - Apply via the online application links in the “Employment” section of the website.

Fellowship Opportunities for Faculty



Consortium Research Fellows Program

- **Senior Fellows (Faculty)**
 - Appointment defined by task/project
 - Scope may vary from expert consultation (1-3 days) to short-term research/analysis (30-40 days)
 - Compensation based on academic rank

- **Sabbatical Fellows (Faculty)**
 - 6-12 month appointment
 - University approved sabbatical
 - Scope negotiated with specific Research Unit Chief
 - Compensation to backfill university partial compensation, plus living stipend if relocating for the sabbatical

Dr. Rhett Graves

Overview of Army Research Institute (Fort Leavenworth) & Priority Research Interests

FORT LEAVENWORTH RESEARCH UNIT & APPLIED BAA OVERVIEW



**Dr. Rhett Graves,
Chief**



**Dr. KC Ejiogu,
Team Leader**

Fort Leavenworth Research Unit

6 November 2023



U.S. Army Research Institute for the Behavioral
and Social Sciences

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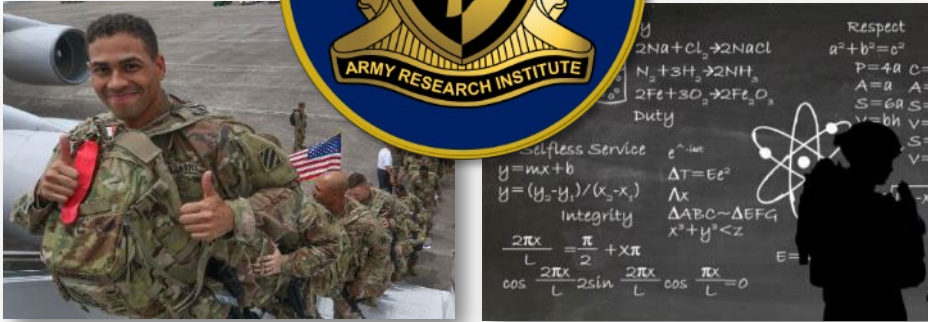
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Applied Research Topics (6.2/6.3)



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Mission: Apply innovative scientific research methods to Army leadership and leader development at organizational and strategic levels to enhance personnel readiness.

Current Research Programs:

- **Assessment and Development of Complex Cognitive Skills of Senior Officers**
 - BAA Topic 2.b.i “Complex cognitive competencies for organizational and strategic leaders.”
- **Modeling Competency Growth**
 - BAA Topic 2.b.ii “Multifaceted development pathways for organizational and strategic leaders”





Army Need: Cognitive talent is a core competitive asset with strategic value. The Army requires valid measures and innovative development methods to assess, track, and develop critical complex cognitive competencies throughout officers' career lifecycles.

Purpose: To create assessments of complex cognitive skills for senior officer development, and to identify or create improved methods to accelerate the development of complex cognitive skills in senior officers at opportune times during career lifecycle.

Payoff:

- Enhanced capability by the Army to accurately assess senior officer performance and focus learning/training and development activities at the right level and the right time, throughout PME and the officer career lifecycle.
- Senior Army leaders able to apply complex cognitive skills in the advising, planning, resourcing, and developing of military capabilities so as to shape the operational environment.

Lines of Effort:

LOE 1: Assessment of Complex Cognitive Skills – develop scientifically valid assessments of senior officer (MAJ, LTC, COL) cognitive skills related to strategic thinking, systems thinking, creative thinking, prediction, situational awareness, critical thinking, and thinking-in-time. Novel assessments are intended to support enhanced talent management capabilities to assess and track talent.

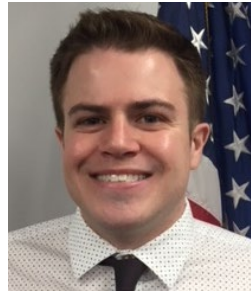
LOE 2: Methods to Develop Complex Cognitive Skills – create innovative methods for developing complex cognitive skills in senior Army officers. Novel development methods are intended to accelerate acquisition of critical cognitive competencies.

Complex Cognitive Skills Team



Dr. Ava Loer

Assessment and development of systems thinking proficiency;
Mitigating the detrimental effects of cognitive biases on officer decision-making



Dr. Cary Stothart

Accelerating innovative thinking proficiency;
Developmental experiences for strategic thinking in Army leaders;
Thinking-in-time

Trevor Bell, Ph.D.

Candidate

Kansas State University

Graduate Student Consortium Research Fellow

Neural correlates of strategic processes in memory;
Statistical and methodological techniques in psychological sciences

Dr. Evelyn Stratmoen

Communication competencies to enhance the impact of experts in Army organizations;
Measurement and development of mental agility



Dr. KC Ejiogu

Team Leader;
Assessment and development of strategic thinking in Army leaders





Payoff:

- Enabling precise and rapid tailoring of development to individuals by providing targeted models of individual competency growth
- Streamlining the use of financial, human, and training/educational resources to ensure leaders possess the competencies they will require at the next level
- Expanding the scope of data used to assess leaders for their future roles, enabling more accurate preparation and placement

Army Need: The Army requires a scientifically grounded understanding of individual competency growth patterns, as leaders move from roles at the tactical level to more senior command and staff roles at operational and strategic levels.

Purpose: To produce scientific models and assessments of how key competencies change over time to provide targeted support to leaders as they develop and take on leadership roles of increasing scope and responsibility.

Lines of Effort:

LOE 1: Patterns of Growth – document differential patterns by which competencies grow, emerge, progress, and regress, as leaders move from tactical to operational leadership.

LOE 2: Competency Reframing – whether and how competencies are reframed across transitions in leadership level and in response to the changing operational environment.

LOE 3: Individual Agency in Development – factors affecting the growth of leaders' competencies based on individual goals, motivations, priorities, and readiness and openness to development.

LOE 4: Adult Development – apply innovations in theory and empirical testing of adult cognitive development, identity formation/reformation, and personal growth. Explore the role of evolving context in adult development.

Submitting Whitepapers and Proposals



- Access and read the BAA: <https://www.grants.gov/search-results-detail/347858> (W911NF-23-S-0010)
- Focal topics and points of contact are described in the BAA
- Two types of submissions:
 - With or Without a Sources Sought Notice (SSN)
- We invite “unsolicited” whitepaper submissions describing research that is relevant to the topics described in the BAA.
 - You can submit these at any time.
 - We will evaluate and provide feedback on your research idea; sometimes this will lead to an invitation to submit a full proposal.
- ARI researchers also produce Sources Sought Notices (SSNs) to solicit whitepapers on specific topics. This results in a competitive process, with multiple submissions from different vendors.
- Whitepapers and proposals are evaluated for scientific and technical merit, potential contribution to ARI’s mission, qualifications/capabilities of the project team, and cost. (Evaluation criteria are detailed in the BAA.)

Modeling Competency Growth Team



Dr. Jimmy Nye

Computational linguistics;
Metacognition;
Creativity and Innovation;
Deception detection



Dr. Marcus Fagan

Educational measurement and psychometrics;
Experimental methodology;
Cyber Competency Development;
Characteristics of Cyber Expertise



Dr. Sarah Kruger
Ph.D., U Nevada, Reno
Post-Doctoral Fellow

Lifespan models of goal selection
in self-development



Dr. Stefanie Stancato

Information advantage;
Decision making in self-development;
Boundaries in systems thinking



Dr. Erica Kessler

Epistemological change;
social construction of
knowledge



Dr. Will Weyhrauch

Team Leader;
Communication
Competency Development

Things to Consider for Applied BAA Whitepapers/Proposals



- **Applied Research with 6.2 and 6.3 funding**

- **6.2** is intended to explore whether concepts, methods, measures, etc., are viable for further development for the Army, i.e., a “proof-of-concept” with testing and refinement in a relevant Army context.
- **6.3** is intended to further refine concepts, methods, measures, etc., for application by the Army, producing a “fully-functional prototype or representational model.” The goal of 6.3-funded research is to produce a product to be transitioned to the Army.

- Movement from 6.1 through 6.3 and beyond...

- **For 6.2/6.3 applied research, ARI prefers contracts** over grants and cooperative agreements.

- Vendors should plan to work directly with ARI researchers, Soldiers, and Army stakeholders/sponsors.

- Hands-on, collaborative approach to research partnerships
- Building and sustaining relationships with stakeholder organizations across the Army
- Collaborating to solve a problem that matters to stakeholders
- Kurt Lewin’s action-research perspective

- When you build your project team, think in terms of both scientific and military subject matter expertise.



- **Applied research should focus on the Army context.** What will the research produce and how will that be used by the Army?
- **Foreign national participation:** “security restrictions may apply that could preclude their participation in these efforts.”
 - For example, “Countries included on the U.S. State Department List of Countries that Support Terrorism are excluded from participation in these efforts.”
- **Institutional Review**
 - ARI’s IRB/HRPP and AHRPO provide institutional review and oversight.



- **Where do we publish?** Defense Technical Information Center (DTIC; the “gray literature”), scientific journals, military professional/trade journals, book chapters, conference proceedings, etc.
- **Reporting** (Scientific Series/Military Series) and Research Product Reports
 - All contracted research requires a publication for each period of a contract (Base and Options)
 - Journal publications, book chapters, conference presentations are also submitted to DTIC after they have been published
- **Pre-Publication Review**
 - Contract language requires manuscript review for operational security (OPSEC) and clearance for distribution prior to submission to a journal for peer review, and then again following peer view/revisions/resubmission.
 - The same process applies for conference presentations—the abstract needs to be reviewed as do the final materials for presentation (e.g., slides, poster).
- **Data use, transparency, and ownership**...if it's data on Soldiers, it's the Army's data!
 - Various regulations pertain to the collection, storage, use, and dissemination of data collected from Soldiers.
 - Contractors are required to use Army-issued systems for storage and analysis of Army data—both qualitative and quantitative.

Dr. Sena Garven

Army University

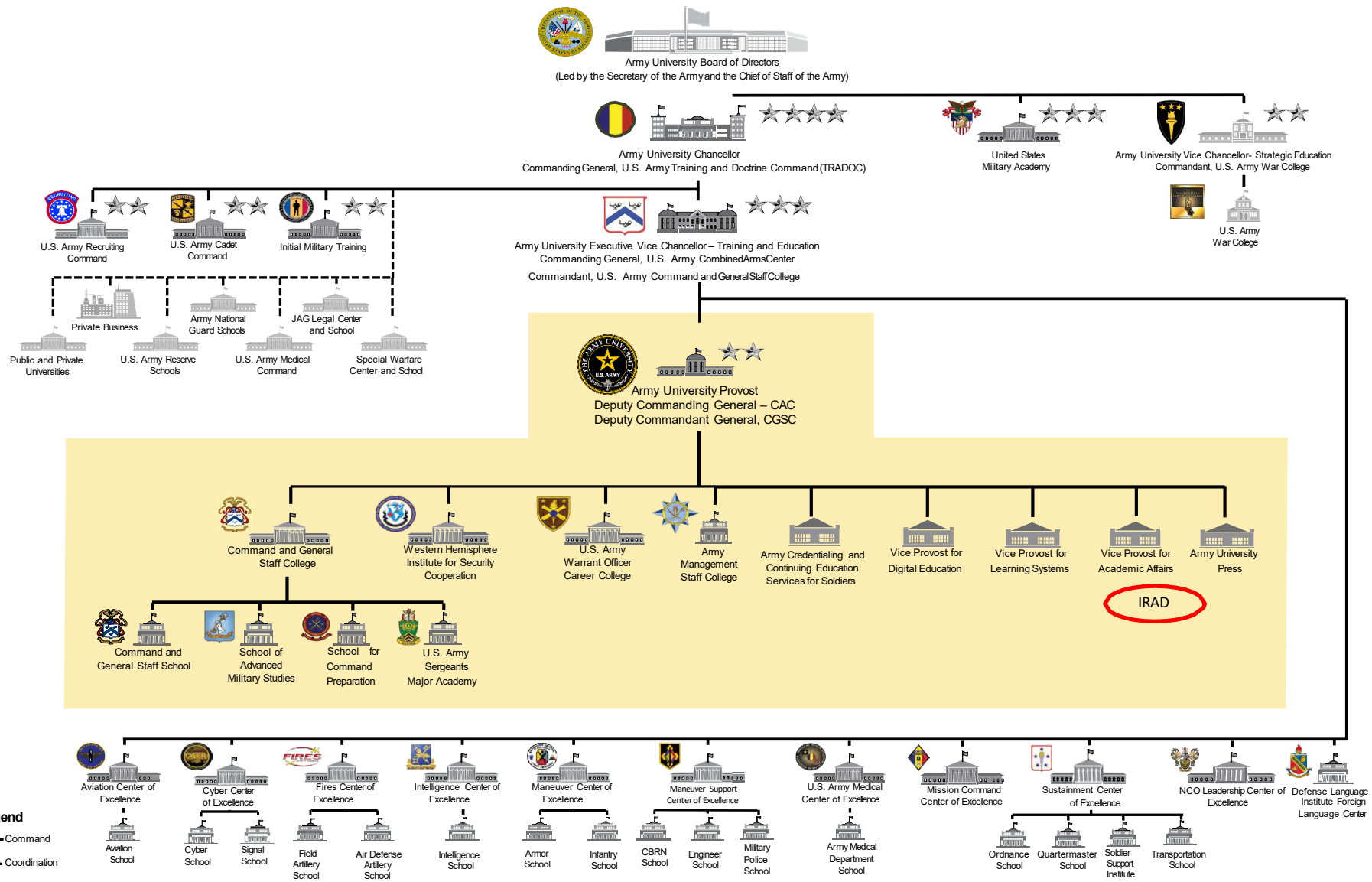
Research Interests & Ways to Collaborate



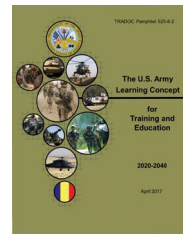
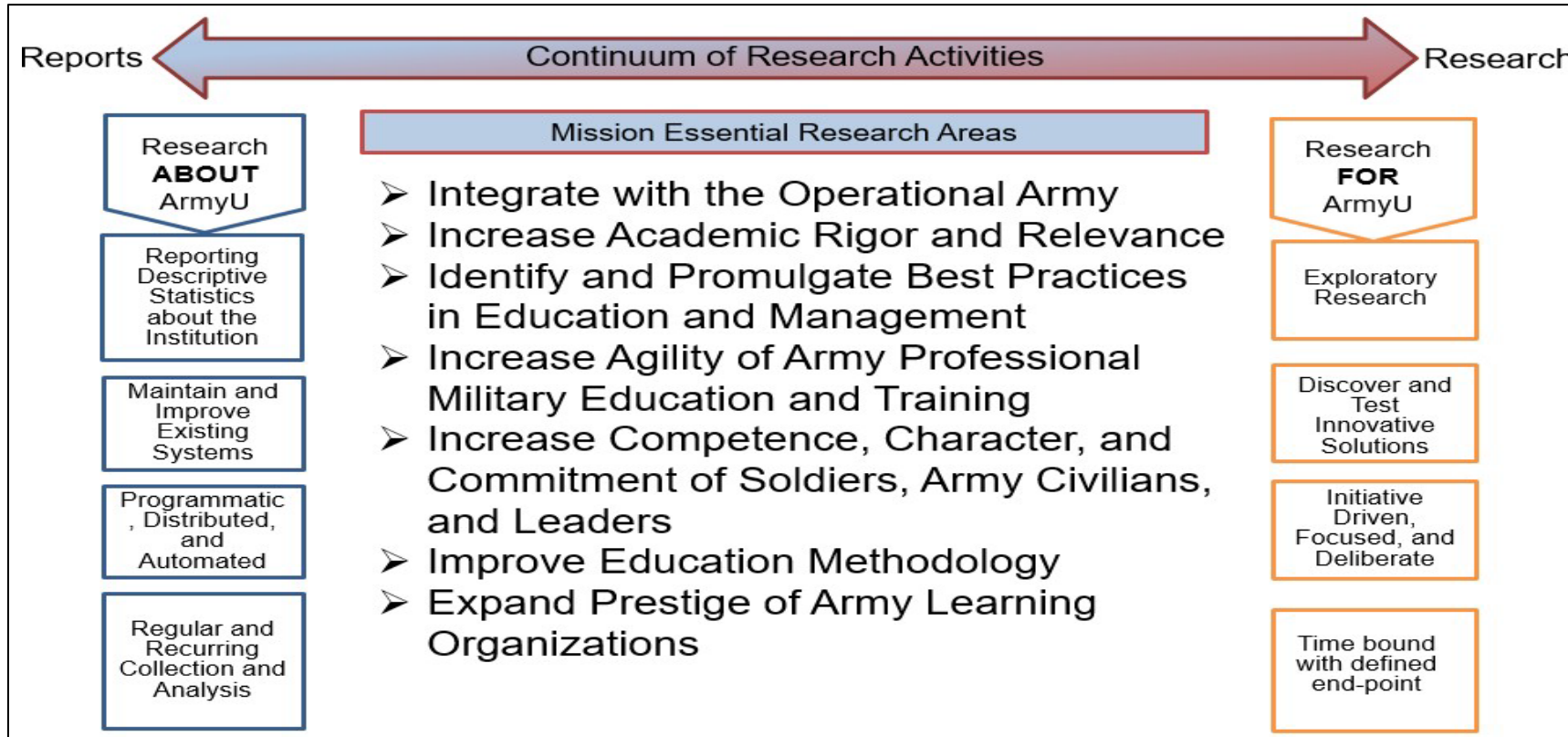
Educate to Win!

Sena Garven
Chief, Institutional Research and Assessment Division
Vice Provost of Academic Affairs
Army University

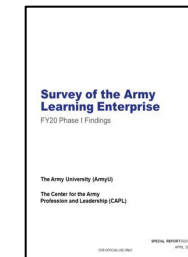
DISCLAIMER: The views expressed in this presentation are those of the author and do not reflect the official policy or position of the US government, the Department of Defense, the US Army, or Army University.



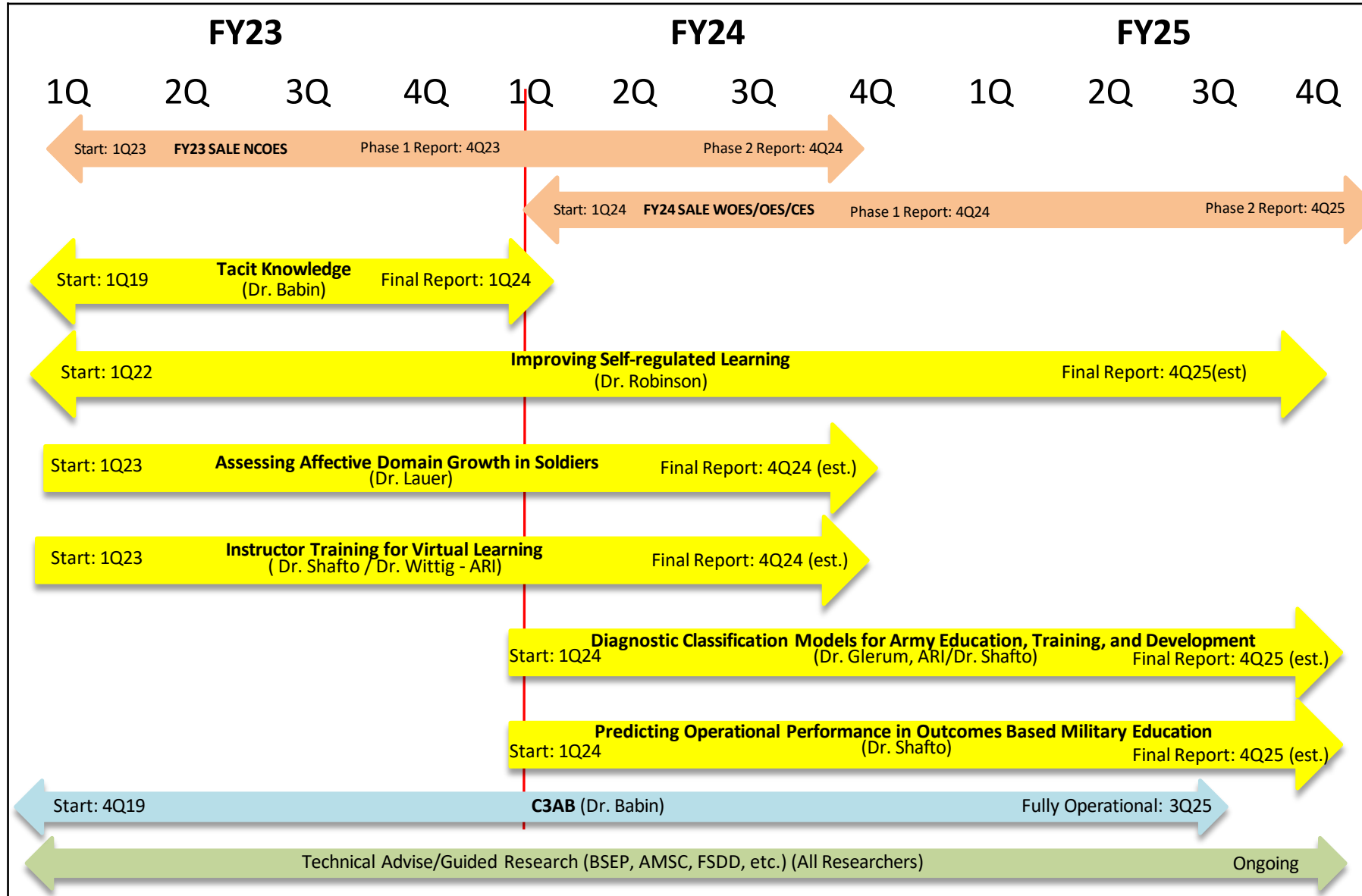
Research Activities Continuum



Best Practices



“Research that Leads to Effective Army Decision Making”





1. The Survey of the Army Learning Enterprise (SALE)

An ongoing, programmatic, enterprise level examination of the relevance, challenge, and overall quality of professional military education (PME).

2. Defining and Quantifying Rigor in Army PME

Create a common understanding within PME of the term, “academic rigor”.

Investigate whether quantifying “academic rigor” within Army PME is possible using Army-created measures.

3. Generalized Intelligent Framework for Tutoring (GIFT)

The DEVCOM-SC, STTC* developed GIFT to provide a set of tools and methods for authoring and delivering adaptive tutoring/instructional systems.

4. Predicting Operational Performance in Outcomes Based Military Education

A multi-phase research project situated in the Captains Career Course (CCC) which will identify current gaps and develop targeted links between course assessments and operational performance measures.



USC/ICT, DEVCOM, and Army U are coordinating efforts to provide quality AI applications that can benefit the Army Learning Enterprise.



Congressionally funded – \$5M/year
 Projected for at least thru FY 25
 Supports TRADOC Pamphlet 525-8-2
 (Army Learning Concept 2030-2040)
 The projects support the three main ArmyU customer groups
 Curriculum Developers
 Instructors
 Students

1. AI-Enhanced Dashboard (AID) for Instructors & Students
 AI enabled tool used in a dashboard format to track for at risk learners, unusually difficult topics, other patterns.
2. Army Writing Enhancement Toolset (AWE)
 An AI-based tool to assist students with Army writing style and help instructors with evaluations.
3. Improving Self-Regulated Learning Skills with AI (ISRL-AI)
 AI enabled tools to support SRL by diagnosing individual learning issues and providing specific, individualized remedies.
4. AI Assisted Revisions for Curricula (ARC)
 AI enabled content update of doctrinal or other changes could be able to recognize curriculum content needing updating.
5. AI-Upskilling with AI Tools (AI-UP)
 An overall package to encourage AI literacy and skills throughout the force.



Dr. Melissa Wolfe

Center for Army Leadership

Research Interests & Ways to Collaborate

KU THE UNIVERSITY OF
KANSAS



Dr. Allison Abbe

Army War College

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KU THE UNIVERSITY OF
KANSAS



Dr. Stefanie Shaughnessy

Consortium Fellows Research Program

KU THE UNIVERSITY OF
KANSAS



Dr. Angie Karrasch

KU C3BE Overview

Center for Certification and Competency-Based Education (C3Be)

Exploring U.S. Army Research Institute Funding
November 6, 2023

Dr. Angela Karrasch
Associate Director, Research & Development



C3Be

C3Be supports responsive learning systems that focus on certification, competency-based education, and work-place informed learning and education. We help universities, businesses, and students better meet each other's needs with learning maps, assessments, and community outreach

- [C3BE Homepage | Center for Certification and Competency-Based Education \(ku.edu\)](https://www.ku.edu/c3be)



What We Do

Make Learning Visible

Our Current Services

- **Competency-Based Education Development & Design**
- **Workforce Development Design & Solutions**
- **Analysis and Visualization of Outcomes & Pathways**
- **Research, Evaluation, & Design**

Q&A Session / Breakouts

Breakout 1 – *English Room* (Dr. Shaughnessy - Foundation Science Research Unit & CFRP)

Breakout 2 – *Malott Room* (Dr. Graves - Army Research Institute, Fort Leavenworth)

Breakout 3 – *Pine Room* (Dr. Ejiogu - Army Research Institute, Fort Leavenworth)

Breakout 4 – *International Room* (Dr. Wolfe - Center for Army Leadership, Fort Leavenworth)