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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Office of the Secretary Of Defense **Date:** February 2018

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603769D8Z / <i>Advanced Distributed Learning</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	10.384	11.211	13.564	-	13.564	13.723	13.493	13.204	12.425	Continuing	Continuing
<i>776: Advance Distributed Learning (ADL)</i>	0.000	10.384	11.211	13.564	-	13.564	13.723	13.493	13.204	12.425	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) describes the Advanced Distributed Learning (ADL) Initiative. This program was originally established in the 1990s in response to the NDAA (FY99, Section 378 of Public Law 105-261) and granted additional authorities via Executive Orders (e.g., EO 13111) and other supporting publications (e.g., 10 U.S. Code §2249d). Organizationally, this PE reports to the Deputy Assistant Secretary of Defense for Force Education and Training (DASD(FE&T)).

This PE provides policy oversight for distributed learning (e.g., online courses, smartphone-based learning, web browser-based simulations) and supports associated innovation, modernization, and coordination across DoD, Coalition partners (e.g., NATO), and other federal agencies. This work largely focuses on distributed learning interoperability (i.e., ensuring interagency technical and organizational systems function together) and helping agencies acquire new distributed learning capabilities effectively and cost-efficiently. Ultimately, this PE’s work promotes personnel readiness, helping the right people to receive the right training and education, at the right time—at the right cost.

This PE’s work falls into three interrelated categories: (1) Modernization, (2) Documentation, and (3) Coordination. The “modernization” work involves Advanced Technology Development (6.3) in technical areas such as e-learning, mobile learning, learner modeling and analytics, and software interoperability. These efforts inform the PE’s “documentation” work, including the authoring and upkeep of technical guidance and policy documents, such as DoD Instruction 1322.26 (“Distributed Learning”) and software interoperability specifications. Finally, the documentation work drives “coordination” efforts, which consist of implementation support and interagency/interorganizational coordination.

This PE’s modernization investments are driven by requirements collected from the Defense ADL Advisory Committee, a working group of military personnel and DoD/federal civilians (at the O-6 and GS-15 level) who represent their agencies’ distributed learning equities and are key stakeholders in shaping the direction of these agencies. These requirements are aligned to DoD/federal strategic direction, such as the Army Learning Concept for Training and Education for 2020–2040 (TP 525-8-2), Navy’s Sailor 2025, and Air Force Strategic Master Plan, and they are considered against emerging industry trends and technologies.

This PE benefits DoD in three ways. (1) Interoperability: It strengthens interagency, interorganizational, and multinational interoperability by governing distributed learning interoperability policy, maintaining current technical reference guidelines, and fostering their implementation across communities of practice. (2) Efficiencies: It saves government resources by fostering unity of effort across DoD, other federal agencies, and Coalition Partners for distributed learning, eliminating duplications and identifying opportunities for interagency collaboration. (3) Learning Effectiveness: It helps improve training and education effectiveness by helping DoD, federal, and Coalition stakeholders acquire and implement emerging distributed learning capabilities effectively and cost-efficiently. In sum, this work supports the components’ training and education missions, helping them increase personnel readiness while driving down training and education portfolio costs.

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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	11.211	11.157	-	11.157
Current President's Budget	10.384	11.211	13.564	-	13.564
Total Adjustments	10.384	0.000	2.407	-	2.407
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	10.384	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	-	-	2.407	-	2.407

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Title: Advance Distributed Learning (ADL)</p> <p>Description: This PE serves as the innovation hub for distributed learning across the DoD and other government agencies, enabling innovation, finding efficiencies, informing stakeholders' modernization efforts, and fostering interoperability across defense, government, and industry. This program's R&D efforts improve efficiencies and reduce costs by reducing time spent in face-to-face instruction, allowing more time for practical application and repetition; increasing interoperability, which enables discovery, retrieval, and reuse of distributed learning content; and researching and prototyping methods of distributed learning with superior motivational and learning outcomes.</p> <p>FY 2018 Plans: Total Learning Architecture – All of the U.S. Services, Joint Staff, and many other federal programs have released publications calling for a modern "learning ecosystem" comprised of interconnected learning opportunities, supported by technology, driven by data, and integrated with other talent management capabilities. This program is supporting its development by investigating the specifications and web-based digital services needed to make training and education technologies interoperable. In FY17, an early "Total Learning Architecture" prototype was tested with 75 Special Operators at Ft. Bragg. In FY18, this project will enter its second phase of development and will include additional empirical testing.</p> <p>Learning Data – In FY17, this program led a revision to DoD Instruction 1322.26, after extensive coordination with the Services and Joint Staff. The revised Instruction recommends the use of the Experience Application Programming Interface (xAPI), a technical specification that enables data exchange across training and education technologies. In FY18, this program will continue to refine the xAPI specification for semantic interoperability and will coordinate with stakeholders to deliver the implementation</p>	10.384	11.211	13.564

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
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<p>guidance, conformance testing tools, learning analytics, and data visualization capabilities they need to make most use of it. In FY18, this work is also expected to inform updates to DoD Instruction 1322.26's fungible technical references.</p> <p>Competencies and Credentialing – In FY17, this program investigated competency and credentialing management technologies, and it prototyped a web-based competency framework tool as part of the Total Learning Architecture demonstration. In FY18, this PE will continue its coordination efforts across defense and federal agencies for competency-based learning, and it will continue working with professional specifications and standards bodies in development of associated interoperability specifications to aid permeability across organizational boundaries.</p> <p>Personal Assistant for Learning – Adaptive learning tools promise to increase the effectiveness and efficiency of training and education, and these tools are critical parts of DoD's modern "learning ecosystem" vision. This program examines the science and technology needed to design such capabilities, using open-architecture and open-source methods. In FY17, this PE successfully tested several frameworks, including a smartphone-based system with Defense Language students and a table-based e-book capability with Special Operators. In FY18, this program plans to work with other agencies to transition some of these capabilities into operational use, coordinate with professional specifications and standards bodies to author relevant technical guidelines, and to continue development of these emerging capabilities.</p> <p>Interagency and Interorganizational Coordination – In FY17, this program provided distributed learning modernization support to more than 40 defense agencies (e.g., The Army Distributed Learning Program, Naval Education and Training Command, Air Education and Training Command, Marine Corps Training and Education Command, Joint Knowledge Online, Defense Acquisition University), more than 15 international partners (e.g., NATO, The Technical Cooperation Program, Partnership for Peace Consortium), and other federal agencies (e.g., National Park Service, Customs and Border Protection). In FY18, this program will continue to coordinate with these stakeholders and with relevant working groups, such as the Defense ADL Advisory Committee, to create technical alignment of distributed learning systems and find efficiencies for the government.</p> <p>FY 2019 Plans:</p> <p>Total Learning Architecture – The Total Learning Architecture will enter its third phase of development, which is expected to include additional application domains and integration with other talent management systems.</p> <p>Learning Data – Collaborate with operational defense training and education organizations to help them implement at-scale instances of prototype learning data interoperability specifications, learning analytics, and visualization capabilities. Ongoing efforts will also continue to inform the DoD Instruction 1322.26's fungible technical references.</p>			
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Competencies and Credentialing – Continue coordination efforts across defense and federal agencies for competency-based learning, with the associated technical guidance potentially informing DoD Instruction 1322.26’s fungible technical references, once they mature.			
Personal Assistant for Learning – Complete development cycles of tablet-based and web-based prototypes. Continue transition of mature specification into relevant technical guidelines, and continue to investigate emerging capabilities.			
Interagency and Interorganizational Coordination – Continue coordination with defense, federal, and international stakeholders, and with relevant working groups, such as the Defense ADL Advisory Committee, to create technical alignment of distributed learning systems and find efficiencies for the government.			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Reduction due to the fiscal guidance adjustments.			
Accomplishments/Planned Programs Subtotals	10.384	11.211	13.564

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

F. Performance Metrics

The primary objectives of this PE are to inform distributed learning modernization efforts, to develop associated policy and guidance documents, and to coordinate across distributed learning agencies to create technical alignment of distributed learning systems and find efficiencies for the government.

MODERNIZATION: The modernization work consists of a collection of smaller technical efforts, each with project metrics that reflect their unique technical goals. Typical metrics include the advancement of related Technology Readiness Levels, the degree to which project investments are leveraged by other defense and federal agencies, the increase in the number of interoperable training and education digital systems, the impact of these efforts on defense/federal strategic planning, and downstream reductions in training and education portfolio costs.

DOCUMENTATION: For the policy and documentation efforts, metrics include at-least annual update of published guidance, ensuring the documentation adheres to current technical/industry standards. The policy and documentation utility is also judged based upon its use, including both number of vendors adopting the policy and number of defense/federal acquisition efforts adhering to the guidance.

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COORDINATION: For the interagency and interorganizational coordination efforts, performance is first measured based upon the number of agencies, international organizations, and professional groups directly supported. Success is measured based upon the number of requirements consolidated across defense and federal stakeholders, an increase in partnering between agencies for distributed learning resource sharing, and, ultimately, in improved return on investment for distributed learning efforts.