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Submitter Information

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General Comment

As measurement scientists dedicated to advancing AI, measurement and assessment system innovation, we appreciate the opportunity to respond to the Request for Information on the 2025 National AI Research and Development Strategic Plan. Our response emphasizes harnessing advances in AI, measurement science, and emerging technologies to transform information systems that strengthen education and workforce development, ensuring diverse, high-quality data serves as the foundational currency for AI-driven learning and training.

See attached file for full comment.

Attachments

5.29.25 RFI Response No. NSF 2025 OGC 0001 Advancing AI Measurement Assessment System Innovation

Subject: Response to Request for Information on the 2025 Development of a National Artificial Intelligence (AI) Research and Development Strategic Plan (Docket ID No. NSF–2025–OGC–0001)

As measurement scientists dedicated to advancing AI, measurement and assessment system innovation, we appreciate the opportunity to respond to the Request for Information on the 2025 National AI Research and Development Strategic Plan. Our response emphasizes harnessing advances in AI, measurement science, and emerging technologies to transform information systems that strengthen education and workforce development, ensuring diverse, high-quality data serves as the foundational currency for AI-driven learning and training.

Data: The Bedrock Currency of the AI Era

High-quality, multimodal data is essential for effective AI-driven education and workforce innovation. Current fragmented datasets constrain AI reliability, scalability, and innovation. Strategic federal investments should prioritize:

- **Building High-Quality, Multimodal, Open Datasets:** Create accessible, anonymized datasets that incorporate varied emerging data types, including audio (e.g., dyslexia diagnostics), video (e.g., performance-based assessments), clickstream analytics from digital learning environments, and sensor data. These robust open datasets will lower barriers to entry, enabling rapid development, validation, and scaling of innovative educational technologies.
- **Expanding Computational Infrastructure Access:** Increase support for national computational resources, such as the National AI Research Resource (NAIRR), providing researchers and developers seamless access to essential AI training, testing, validation, and dataset utilization capabilities.
- **Enhancing Cybersecurity and Privacy Protecting Technologies:** Implement standardized frameworks and invest in privacy enhancement to ensure secure, ethical, and interoperable management of sensitive education and workforce data, fostering trust and seamless collaboration among researchers, educators, and industry partners.

Strategic federal investments in public datasets and computational infrastructure for R&D will accelerate innovation, drive efficiency, and secure U.S. leadership in AI-driven education and workforce development.

Innovating What, How, and For Whom We Measure

- **Innovating What We Measure:** Measurement and assessments in education and workforce have historically focused on easily measurable outcomes, often overlooking critical cognitive, affective, and behavioral competencies. R&D must drive AI-powered assessment systems to evolve to capture those complex, future-oriented skills—such as collaborative

problem-solving, critical thinking, adaptability, creativity, and AI literacy—necessary for thriving in a dynamic workforce environment.

- **Innovating How We Measure; AI-Enhanced Multimodal Approaches:** Advances in AI and data analytics enable innovative assessment methods that integrate varied multimodal data—such as video, audio, sensor-generated data, digital clickstream analytics from learning platforms and games, and interactive performance tasks. Multimodal approaches yield deep and authentic insights into learning processes and skill development, providing timely, precise, and actionable feedback to enhance educational outcomes and workforce readiness.
- **Innovating For Whom We Measure; Enhancing the Value Proposition of Data for Learners, Educators, and Families:** AI-powered assessments will deliver immediate, personalized learner feedback, enhance instructional effectiveness, and generate actionable insights to improve outcomes, embedding assessment seamlessly into learning experiences.

Global Context: Urgent Need for U.S. Leadership

Countries including China, Singapore, South Korea, and the United Kingdom are rapidly advancing AI-enabled education and workforce data infrastructures. Immediate and strategic federal investments in AI-driven educational measurement and assessment are essential for preserving U.S. leadership, competitiveness, and economic security.

Strategic Recommendations for Federal Investment

To achieve transformative educational and workforce outcomes powered by AI, we recommend the National AI R&D Strategic Plan prioritize:

- **Mapping and Improving Critical Government Data Assets:** Identify and prioritize open government data resources vital for AI-driven education and workforce solutions; strengthen data collection and curation to boost quality and usability.
- **Establishing a National Next Generation Education and Workforce Data Initiative:**. Launch a federal R&D effort focused on developing and scaling next generation data to fuel AI-powered solutions. Develop and publish high-quality, open multimodal data assets. Invest in comprehensive, anonymized public datasets tailored explicitly for education and workforce use cases. Example datasets might include annotated audio recordings to identify dyslexia, clickstream analytics from science and math problem-solving activities, and multimodal datasets integrating sensor, video, and performance-task data.
- **Expanding National R&D Funding for Measurement and Assessment System Innovation:** We recommend a coordinated, long-term federal initiative—led by the U.S. Department of Education, Department of Defense, National Science Foundation, and National Institute of Child Health and Human Development—to strengthen data generation, measurement and assessment capabilities. This initiative should prioritize AI-driven technologies capturing teaching and learning processes and critical cognitive, socio-cognitive, and socio-emotional competencies. Such investments will enhance data quality and directly improve educational and workforce outcomes.

- **Driving R&D on AI-powered reskilling and upskilling of educators:** A key R&D priority is to explore and validate AI-powered learning systems, training platforms, and micro-credentialing that can efficiently reskill and upskill individuals. This includes research into how AI can make teaching and learning more accessible and effective, given learner variation.
- **Enhancing the National AI Research Resource (NAIRR):** Dedicate expanded computational capacity and resources within NAIRR specifically for educational and workforce data, ensuring broad-based access to advanced AI research infrastructure.

Conclusion

Strategic investments in open data infrastructure and AI-driven measurement innovation will transform educational and workforce solutions—including reshaping what, how, and for whom we measure. By embracing multimodal open data and leveraging U.S. strengths in measurement science, we can ensure timely, actionable insights. This critical investment will secure America's continued global leadership in AI-enhanced education and workforce development.

Respectfully submitted,

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