NATIONAL SCIENCE FOUNDATION
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Dear Colleague Letter: Visionary Interdisciplinary Teams Advancing Learning (VITAL) Prize Challenge

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Dear Colleague:

The U.S. National Science Foundation (NSF), the Bill & Melinda Gates Foundation, Schmidt Futures, and the Walton Family Foundation recognize that the COVID-19 pandemic severely impacted students across the United States, with scores in mathematics falling in nearly every state[1]. Disparate access to learning, an ongoing and pervasive issue exacerbated by COVID-19, has limited learners of all ages to engage in opportunities that support academic achievement, digital literacy and skills development, postsecondary pathways, and economic security[2].

Educators, school districts, government agencies, foundations, and investors are driven to build innovative and scalable solutions to prepare students for the future. Development of such educational technologies could improve equitable and inclusive access to resources and help the United States with ongoing efforts to develop a more competitive, highly-skilled U.S. workforce. Concurrently, the growth of emerging technologies (e.g., artificial intelligence including large language models, neural networks and adaptive algorithms, virtual/augmented reality, and open networks), coupled with greater understanding of the impacts of these technologies on humans and the human-technology interface show promise of game-changing applications within the educational technology innovation ecosystem.[3] *However, researchers in these fields may not be fully aware of the contextual aspects or implications of applying these emerging technologies within an educational setting.*

Educational and learning technology products are often designed based on a limited understanding of how people learn, and how students vary in ways they learn best[4]. Additionally, the multiple stakeholders, end-users and decision-makers who encompass the educational ecosystem are not always taken into account or fully understood when developing educational and learning technologies[5],[6]. Coalescing researchers, developers, educators, and learners with a wide range of identities, experiences and perspectives

provides not only an intersectional lens[7], but further enables innovation[8] that can accelerate progress toward equitable outcomes for all learners.

PRIZE CHALLENGE

Through this Dear Colleague Letter (DCL), NSF along with the Bill & Melinda Gates Foundation, Schmidt Futures, and the Walton Family Foundation seek to catalyze the translation of research discoveries into breakthrough learning technologies through a $6 million Visionary Interdisciplinary Teams Advancing Learning (VITAL) Prize Challenge.

The VITAL Prize Challenge will incentivize interdisciplinary teams to create innovative and translational K-12 learning technologies that synthesize recent discoveries in science and engineering with educational and training processes. Such use-inspired innovations possess the potential to equitably improve learning outcomes for all students and broaden learner engagement, especially when focused on the assets, needs and issues of traditionally marginalized groups. At scale, these technologies have the potential to impact to the U.S. educational system and improve workforce development.

Teams responding to the VITAL Prize Challenge announcement will submit concept papers to one of three K-12 technology translation tracks, depending on the anticipated application, end user and area of impact. These three tracks will focus on:

- Rapid and Continuous Learning Assessment;
- Mathematical Literacy to Promote a Future STEM Workforce; and
- Other Innovations in Translational Learning Technologies.

At its core, the VITAL Prize Challenge will focus on providing interdisciplinary teams the funding and training to build K-12 learning and technology innovations at speed and scale for adoption nationwide. VITAL will be composed of four progressive "challenge" activities:

- Concept Paper: A concept paper is submitted by a team;
- Discovery Round: A subsequent invitation for approximately 100 chosen teams to participate in customer discovery activities;
- Semi-Final Round: Approximately 55 teams are partnered with an educational mentor (e.g., K-12 teacher) for prototype design, feasibility testing and initial development activities; and
- Final Round: Approximately 18 teams will further prototype development and validation, culminating with a Pitch Session.

These activities will influence the broader field by incentivizing innovations that synthesize recent discoveries in science, technology, engineering, and math (STEM) with education and training processes. The intent is to promote novel and impactful ways to bring together

diverse educators, researchers, and developers, and create more integrated and equitable innovations in learning technology that also scale diverse pipelines in the STEM workforce. By facilitating elements of inclusive innovation across both education and STEM and among historically excluded populations, VITAL can stoke equitable and effective innovation in core areas of learning technologies, such as rapid and continuous learning assessment and mathematical literacy.

Participating teams will have the chance to receive over $70,000 in development and commercialization support through the Discovery, Semi-Final and Final Rounds and up to $250,000 in cash prizes per team. These teams will be supported through training, coaching, resources, and funding to develop a marketable educational technology prototype that can equitably impact learning. They will simultaneously build capacities in entrepreneurship, research-based design, safeguarding learner privacy, learner variability, inclusion, and equity in the education marketplace.

ELIGIBILITY

Eligible teams will represent the broader U.S. research and innovation ecosystem, including universities (researchers and students) and the private sector (e.g., startups) and will be interdisciplinary in member composition. Teams with members from traditionally marginalized groups are highly encouraged to apply. Technologies considered for the competition should be in their initial feasibility phase, and not strictly fundamental research or already validated K-12 educational products with financial backing, to maximize the translational potential and ultimate commercial impact of the VITAL prize award. Furthermore, there should be an emphasis on equity-centered design throughout the challenge activities with teams deeply engaging teachers and those from the broader educational community to ensure that the technologies being developed support a diverse community of K-12 learners, especially those in traditionally marginalized groups.

CONCEPT PAPER SUBMISSION

The VITAL Prize Challenge portal will begin accepting concept papers in Winter 2023. To learn more about the VITAL Prize Challenge and how to apply, visit https://beta.nsf.gov/tip/vital-prize-challenge.

Sincerely,

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[1] New York Times, 2022.

[2] Levinson, Geller, & Allen, 2021; Dorn Hancock, Sarakatsannis, & Viruleg, 2021; Digital US Coalition, 2020; Liu, 2021; Education Superhighway, 2021; and NASEM, 2022.

[3] Ceha, J., Law, E., Kulić, D., Oudeyer, P., & Roy, D., 2022; Dube and Wen, 2022; Cuturi, L.F., Cappagli, G., Yiannoutsou, N. et al., 2022; and NASEM, 2022.

[4] Burstein, 2020; Vaala, Ly, & Levine, 2015.

[5] Forbes, 2019.

[6] Kovalskys, G., 2016.

[7] Indar, 2018.

[8] Philips, 2017.

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