*Request for Proposals 2020-2021*

# Learning Lab Grand Challenge:
# Overcoming the Calculus Barrier to STEM Success

==Revised on March 19, 2021, with updates on pages 13-14. Updates are in red.==

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# I.  Overview

[Assembly Bill 1809 (Chapter 33, Statutes of 2018)](#) established the California Education Learning Lab ("Learning Lab") as a competitive grantmaking program for [intersegmental faculty teams](#) from California's public colleges and universities to incorporate the [science of learning](#) and [adaptive learning technology](#) into their curriculum and pedagogy, with the express purpose of improving learning outcomes and closing [equity gaps](#) in science, technology, engineering, and mathematics (STEM) and other disciplines. Learning Lab's unique focus is to promote a positive feedback loop between learning theory/research and educational practice, enabled by technology-rich environments, which can then be shared and scaled for the benefit of students.

**For the 2020-21 grant cycle, Learning Lab is soliciting proposals for "*Learning Lab Grand Challenge: Overcoming the Calculus Barrier to STEM Success*."**

## The Grand Challenge

Calculus is considered to be foundational to many STEM fields. As a result, students are often required to enroll in this course series in their first year as they pursue life sciences, physical sciences, computational sciences, and engineering degrees. However, the college calculus sequence poses considerable barriers for prospective STEM students. Students often single out introductory mathematics courses as a primary reason for leaving, in addition to "ineffective teaching methods and uninspiring atmospheres" in introductory-level STEM courses.[1] Retention and degree completion gaps are especially prevalent for Black/African Americans, Latinx, Native American, and Pacific Islander groups and women, despite showing high levels of interest in STEM.[2]

Data from California's institutions of higher education – University of California, California State University, and California Community Colleges – indicate that the first-year calculus sequence continues to be a significant barrier to persistence in STEM, with disproportionate impacts on Black/African Americans, Latinx, Native American, and Pacific Islander groups. For California's public institutions, pass rates in Calculus 1 vary by approximately 10 percentage points, or sometimes more, based on race and ethnicity. Moreover, enrollment by gender varies significantly in the community colleges, while enrollment by race and ethnicity varies in both the CSU and California community colleges. Data show that as many as 30 to 50 percent of

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[1] Hagman, J.E., Johnson, E. & Fosdick, B.K. Factors contributing to students and instructors experiencing a lack of time in college calculus. *IJ STEM Ed* 4**,** 12 (2017). [https://doi.org/10.1186/s40594-017-0070-7](https://doi.org/10.1186/s40594-017-0070-7).

[2] While some Asian American subgroups would also likely show STEM retention and degree completion gaps, Learning Lab was not able to access disaggregated data for the purposes of this RFP announcement.

student groups who attend California public higher education institutions may not pass Calculus 1 in any given year.[3]

Given that early college experiences are considered critical for retaining students in STEM,[4] Learning Lab invites faculty from across California's public higher education system to reconceptualize the role of and approach to calculus in students' first-year introductory STEM experience.[5] Learning Lab welcomes proposals that seek to directly transform the calculus sequence as well as proposals that reimagine the role of calculus in STEM majors where calculus is a prerequisite.

In crafting a response to this RFP, respondents should consider the following questions:

*The core quantitative skills in STEM are increasingly represented by computational, statistical, and discrete math. What are creative alternatives to the first-year experience that simultaneously reflect the reality of 21st century STEM and minimize the role of calculus as a barrier to STEM entry?*

*What are the concepts in first-year calculus that can be deconstructed and which are needed for students to be successful in majoring in STEM fields?*

*How can calculus be taught better, i.e., in ways that lead to greater student success? How might different approaches to assessment increase student success?*

*In what ways can calculus be taught to communicate belongingness and validation of racially minoritized students and women to increase their success?*

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[3] Pass rates (and what constitutes a passing grade) vary among the three segments of public higher education. Learning Lab intends to commission a study to provide a more comprehensive and precise analysis of outcomes and enrollment.

[4] Toven-Lindsey, B., Levis-Fitzgerald, M., Barber, P. H., & Hasson, T. (2015). Increasing persistence in undergraduate science majors: a model for institutional support of underrepresented students. *CBE life sciences education*, *14*(2), ar12. https://doi.org/10.1187/cbe.14-05-0082

[5] First- year can be defined expansively – from the time leading up to college all the way through the end of the first academic year.

**Learning Lab intends to award up to five grants of approximately $1 million to $1.5 million over three years to support this Grand Challenge.** In addition to executing on project deliverables, awardees will join the Grand Challenge Cohort through which they will share ideas, approaches, findings, data, and outcomes over the three-year grant period. Grounded in their experiences, awardees will collaboratively produce, by the end of the grant period, recommendations for model first-year STEM curricula with effective pedagogical approaches and faculty professional development components built in. **A coordinating institution or project team will be selected to receive $500,000 over three years to foster collaboration among grantees and serve as the Cohort Facilitator.**

By the end of the grant period, awarded projects should demonstrate significant positive impacts, particularly for Black/African American, Latinx, and Native American students, including increased success, confidence, and enthusiasm in studying STEM, entering the STEM workforce, and understanding how a STEM education can address today's most pressing challenges. Awarded projects should also be able to demonstrate changes in faculty mindset and practices, including the adoption of more inclusive and effective teaching practices.

## II.    Application Process and Timeline

### Grand Challenge Grant Application Process

Learning Lab intends to award up to five grants of approximately $1 million to $1.5 million over three years to support this Grand Challenge. The grant application process consists of three parts:

1) Statement of Intent
2) Self-Assessment and Concept Proposal
3) Full Proposal

All applicants must submit a Statement of Intent as well as a Self-Assessment and Concept Proposal. Learning Lab's Selection Committee will then invite a select group of applicants to submit Full Proposals. All grantees must submit their application materials through Learning Lab's Grand Challenge Application Portal.

Additionally, a PI or co-PI must participate in at least one meeting sponsored by Learning Lab on racial and gender equity. Learning Lab will host a web-based conversation series on race and gender equity between mid-December 2020 and mid-February 2021. Learning Lab will send out notifications and post information on our website about the schedule. (See below for additional information and sign up on Learning Lab's listserv to receive updates.)

## Cohort Facilitator Application Process

One institution or project team will be selected to receive $500,000 over three years to foster collaboration among the Grant Challenge Cohort. The grant application process consists of three parts:

1) Statement of Intent
2) Cohort Facilitator Application
3) Cohort Facilitator Follow-up Questionnaire

All applicants must submit a Statement of Intent as well as a Cohort Facilitator Application. Learning Lab's Selection Committee will then invite a select group of finalists to fill out an additional questionnaire. The Cohort Facilitator will be selected in tandem with the Grand Challenge Cohort projects.

Only institutions of public higher education in California may apply (this includes segment offices such as the California Community Colleges Chancellor's Office, the California State University Chancellor's Office, and the UC Office of the President). An institution of public higher education is not required to apply for the Grand Challenge itself in order to apply for the Cohort Facilitator role. All institutions and project teams interested in coordinating the Grand Challenge Cohort as the Cohort Facilitator must submit their application materials through Learning Lab's Cohort Facilitator Application Portal.

Please join us on **Friday, December 11, 2020, at 12 Noon PT** for **Learning Lab Equity Conversation Series: *The Meaning of Racial Equity***.

Please join us again on **Friday, December 11, 2020, at 2:00pm** for a **Virtual Q&A session** on the Grand Challenge and Cohort Facilitator funding opportunities. Please submit any questions to info@calearninglab.org by 5pm on Wednesday, December 9, 2020, to include your question in the Q&A session. Preliminary FAQs can be found on the Learning Lab site.

# Request for Proposals Timeline

Both the projects and coordinating institution/project team will be selected and finalized through a dual stage process outlined below. Learning Lab will send out notifications and post information on our website regarding the web-based racial and gender equity conversation series. (GC = Grand Challenge; CF = Cohort Facilitator)

| Application Stage | Associated Date |
| --- | --- |
| Release of Request for Proposals | November 19, 2020 |
| Submit Questions to Learning Lab: info@calearninglab.org | December 9, 2020, 5:00pm |
| Equity Conversation Series #1: The Meaning of Racial Equity | December 11, 2020, 12:00pm |
| Virtual Q&A Session on RFP (GC; CF) | December 11, 2020, 2:00pm |
| **Statement of Intent (GC; CF)** | **DUE January 15, 2021, 5:00pm** |
| **Self-Assessment and Concept Proposal (GC)** | **DUE February 19, 2021, 5:00pm** |
| **Cohort Facilitator Application (CF)** | **DUE February 19, 2021, 5:00pm** |
| Review Period #1 | February 22-March 12, 2021 |
| Selection Committee Meeting #1 | TBD |
| Notification of Finalists | By March 19, 2021 |
| **Full Proposal (GC)** | **DUE April 23, 2021, 5:00pm** |
| **Cohort Facilitator Follow-up Questionnaire (CF)** | **DUE April 23, 2021, 5:00pm** |
| Review Period #2 | April 26-May 16, 2021 |
| Selection Committee Meeting #2 | TBD |
| Notification of Award (GC; CF) | By May 21, 2021 |
| Grand Challenge Cohort projects and activities commence | (No later than July 1st, 2021 |

# III. Eligibility to Apply for a Grand Challenge Grant

To apply for a Learning Lab Grand Challenge Grant, projects must:

- **Consist of an [intersegmental team](#):** Teams must include faculty and/or administrative co-principal investigators (PIs/co-PIs) from at least two of California's public higher education segments. Additional partnerships, such as with private independent/nonprofit institutions and/or industry partners, are permitted. One institution must be identified as a host institution, which will be responsible for receipt/administration of the grant funds.

- **Impact the intersection of calculus and the STEM first-year introductory experience:** Projects should focus on students' first year experience, broadly defined as the time leading up to college all the way through the end of the first academic year, and address either the calculus sequence directly or reimagine the role of calculus in STEM majors where calculus is a prerequisite (i.e., address how calculus or alternative quantitative modalities might be used in other STEM introductory courses).

- **Work to improve learning outcomes and close racial and gender equity gaps in STEM:** Projects must provide data regarding existing [equity gaps](#) on their campuses. Moreover, projects must have potential to improve learning outcomes and close equity gaps for undergraduate STEM students. Funded projects should also meet statutory criteria by:
  - Incorporating the [science of human learning](#)
  - Incorporating aspects of [adaptive learning](#), broadly defined
  - Improving [online or hybrid course environments](#), broadly defined

- **Have support and endorsement from leadership:** Projects require the endorsement of the host institution's president, chancellor, vice chancellor/vice president of instruction, or provost or equivalent through an [institutional cover letter](#). Partnering institutions must also provide endorsement by either signing the host institution's cover letter by submitting their own letter(s).

**Additionally, a PI or co-PI must participate in at least one meeting sponsored by Learning Lab on racial and gender equity.** Learning Lab will host a web-based conversation series on race and gender equity between mid-December 2020 and mid-February 2021. Learning Lab will send out notifications and post information on [our website](#) about the schedule. Attendance at one of these meetings will be required by the project's PI or one of the co-PIs. Sign up on [Learning Lab's listserv](#) to receive updates.

# IV.    Set Yourself up for Success

## Crafting a Successful Proposal

Successful applicants will demonstrate:

1. *How the project will accommodate a diversity of student preparation and help all students succeed.*

2. *How the project will apply practices that have demonstrated positive impacts on how students learn (e.g., active learning, adaptive learning, applied learning, project-based learning, etc.) and include interventions in the affective domain (e.g., sense of belonging/identity; social/emotional/cultural contexts; growth mindsets, including faculty growth mindset, etc.).*

3. *Who the project team will include and how the project will demonstrate authentic collaboration among partner institutions, as well as leverage a diverse array of practitioners and researchers with expertise in areas such as instructional design, cognitive psychology, culturally responsive pedagogy, learning technologies, in addition to expertise in relevant STEM discipline(s).*

4. *How the project will capture and catalog data and practices to share with other practitioners and researchers, and utilize data to iterate improvements to the project.*

5. *How the project will include a professional development component, including professional development in how to attend to and close racial and gender equity gaps.*

6. *How the project will be supported by and aligns with the goals of the host and partner institutions*.

## Understanding Project Expectations

Awarded teams will be expected to:

- *Use common technology tools and collaborate on the same or interoperable platforms, and design instruction for fully online or hybrid course environments.*

- *Meaningfully participate in the Grand Challenge Cohort during the entire project period by sharing approaches to data collection, measurement, and assessment and co-developing recommendations for model first-year STEM curricula with effective*

*pedagogical approaches and faculty professional development components built in by the end of the third year of the grant.*

- *Sustain the project's impact across partnering institutions beyond the life of the grant award, and aid in the dissemination of practices to other (non-awarded) institutions.*

- *Work toward achieving the project's stated concrete, measurable short and long-term goals in the following areas:*
  - Increasing the percentage of faculty who adopt inclusive and other evidence-based practices that promote student success, particularly for historically underrepresented students;

  - Increasing student enrollment, pass rates, persistence, transfer and/or graduation rates in STEM pathways and/or increasing the number of STEM pathways, particularly for historically underrepresented students;

  - Increasing the percentage of students, particularly historically underrepresented students, who report a welcoming/supportive climate and belonging in STEM courses/disciplines; and

  - Increasing the number of students, particularly historically underrepresented students, who feel prepared to enter the workforce and obtain and succeed in STEM-related internships.

# V. Grand Challenge Grant Proposal Requirements

## Statement of Intent

Applicants must file a Statement of Intent that identifies the anticipated host and partnering institutions and provides the names of PIs/co-PIs as well as brief project information. The Statement of Intent must be submitted by logging on to Learning Lab's Grant Portal and filling out the Statement of Intent form. **The deadline to file a Statement of Intent is 5:00pm PT on Friday, January 15, 2021.**

## Project Summary, Self-Assessment, and Concept Proposal

Teams that have submitted a Statement of Intent by the deadline will be asked to fill out the following summary information regarding the project on Learning Lab's Grants Portal and

submit a Self-Assessment along with their Concept Proposal. **The deadline to file the Project Summary, Self-Assessment, and Concept Proposal is 5:00pm PT on Friday, February 19, 2021.**

## Project Summary Information:

- **Project Title:** Teams must develop a short title for their proposed project. This title should be used in all related documents of the proposal.
- **Project Abstract:** Please provide a short project abstract (150-200 words).
- **Estimated Project Impact:** Please indicate the number of students and/or faculty that will be directly impacted by project activities during the project period. Please share the basis of the calculation.
- **Tags:** Please list the technology tools and platform, and pedagogical practices your project will be using.

*FAQ: What if my information has changed since filing my Statement of Intent?*

## Self-Assessment:

Please describe the status quo, goals, and how and why each partner institution is prepared to join this Grand Challenge. (Limit: 2 pages per institution.) In your narrative, please respond to the following:

**What are the relevant data at your institution?**

Please review institutional, departmental, and course-level data to better understand how calculus requirements are impacting students by race/ethnicity and gender. Please outline the specific racial and gender equity gaps that your team plans to address through your project.

**How is calculus a barrier to STEM student success at your institution?**

In light of this data, please assess how calculus poses a barrier to student success in attaining STEM degrees. Responses should address institutional, departmental, and/or classroom-level barriers that impact students' learning and/or their first-year college experience. How would you describe the student experience for racially minoritized students and women in calculus at your institution? (Please include both completers and non-completers in this description.)

**How is your institution ready to engage in Learning Lab's Grand Challenge?**

Please describe efforts that are currently underway at your institution to better understand diversity, equity, and inclusion in STEM and promote a more positive STEM culture. What is your assessment of your department/institution's capacity for embracing change (pedagogical change, curricular change, professional development)? What can you point to that would support your department/institution's readiness to take part in this challenge?

**Additional Context (optional)**

Please provide any additional context that you believe is relevant to this self-assessment activity.

*FAQ: How will our self-assessment be evaluated?*

## Concept Proposal:

Please describe succinctly and clearly in 4-6 pages the proposed project and how the project's approach will overcome the calculus barrier in STEM. Please highlight in your narrative the following:

- What is innovative about your project? How will your project change the status quo?
- How will you integrate effective and inclusive pedagogical practices into your project?
- How will you utilize data and technology tools in your project?
- What is your budget request and what will Learning Lab funds be spent on?
- What are the qualifications/experience of the PI and co-PIs, related to accomplishing the goals of the project?

Based on your self-assessment, please also identify your specific concrete, measurable short and long-term goals for the project relative to the following areas:

- Increasing the percentage of faculty who adopt inclusive and other evidence-based practices that promote student success, particularly for historically underrepresented students;
- Increasing student enrollment, pass rates, persistence, transfer and/or graduation rates in STEM pathways and/or increasing the number of STEM pathways, particularly for historically underrepresented students;
- Increasing the percentage of students, particularly historically underrepresented students, who report a welcoming/supportive climate and belonging in STEM courses/disciplines; and
- Increasing the number of students, particularly historically underrepresented students, who feel prepared to enter the workforce and obtain and succeed in STEM-related internships.

# Full Proposal

For applications that have been selected to move to the full proposal stage, the following elements will be required: i) institutional cover letter(s), ii) project narrative, iii) response to Selection Committee notes, iv) endnotes/footnotes, v) additional team member information, vi) budget request. **The deadline to file the Full Proposal is 5:00pm PT on Friday, April 23, 2021.**

## Institutional Cover Letter

Each host institution must respond to the following bullets in a brief cover letter **(maximum 2 pages, not including signatures)**. Partnering institutions must also provide endorsement by either signing the host institution's cover letter or by submitting their own brief cover letter. If partner institutions choose to submit an additional cover letter, we ask that they be identified by the same project title as the host institution's identified project title.

The Host Institution's cover letter should contain the following information:

- **Listing of host and partner institutions:** Identify the host institution that will be responsible for receipt/administration of the grant funds, if awarded. Also identify anticipated partner institutions that will engage in the project.
- **Institutional focus:** Describe each host and partner institution's expected commitment (e.g., faculty release time, funding, administrative support) to the proposed project.
- **Lasting impact/program integration/readiness:** Describe how the proposed project's innovations and changes will be sustained after the end of the grant project. Explain also how the proposed project will fit into or leverage any existing related initiatives. Please also describe the readiness to engage with the Grand Challenge cohort.
- **Principal investigators:** Identify the investigators who will serve as PI(s) and co-PI(s). Please address each person's capacity to execute this project.
- **Required signatures:** The institutional cover letter must be signed both the PI/Co-PI responsible for administering the project and by the PI/Co-PI's dean AND the institution's president, chancellor, vice chancellor/vice president of instruction, or provost or equivalent. Co-PIs from partner institutions must also provide their signature, along with a signature from their institution's president, chancellor, vice chancellor/vice president of instruction, or provost or equivalent as well.

All cover letters should be submitted along with the project narrative through Learning Lab's Grant Portal.

## Project Narrative

Each project team must submit a project narrative. **(The main body of the project narrative should be 8-10 pages long. <span style="color:red">Please use no smaller than Arial 11 point font and no less than 0.5" margins.</span>** Project teams have complete flexibility in constructing their narrative. However, the project narrative should aim to answer the following questions:

**WHO will experience WHAT differently?**
- Explain your project's innovative approach and how it will overcome the calculus barrier to STEM success.
- Explain who the target populations are and what the target interventions are. (Please provide the size or scope of each.) **Please use an asset-based framework/language when referring to the target student population.**
- Outline the technology tools your team will be using and/or developing, including the project's approach to adaptive learning.
- Provide an example of how the project will work in practice.

**HOW will the project meet its goals (Implementation Plan)?**
- Outline specific goals, including goals specified in your concept proposal.
- Describe the project team, their qualifications, and their specific roles in the project.
- Outline your team's implementation plan.
  - Include a timeline and discussion of expected milestones and deliverables.
  - Specify which PIs/Co-PIs/institutions are participating in each phase of the project.
- Describe your team's assessment plan that will be used to evaluate the effectiveness of the innovation.
  - Outline the type of data your project team intends to collect as well as planned assessment methods.
  - If possible, please provide information according to the following table:

| Project Goal or Objective | Anticipated Outcomes | Assessed By (include method and metric) |
|---|---|---|
|  |  |  |

**HOW will the project promote sustainable change?**
- Describe how the proposed project will have lasting impact on participating campuses.
- Describe how your project has the potential to be scaled and/or replicated at other institutions and how others will be able to utilize your work.
- Describe how your team plans to disseminate results.
- Include references to other successful models that may indicate your project has potential for success.

## Response to Selection Committee Notes

For applicants moving on to the full proposal stage, the Selection Committee will have notes that the applicant team must address. **Please refer to the email attachment sent from Learning Lab on March 19, 2021, entitled, "Learning Lab's 2021 Selection Committee Feedback for Grand Challenge Applicant." The email attachment contains both requests for response that are specific to the applicant team, and a set of additional questions that all teams must respond to. The set of questions all teams must respond to are repeated directly below. The response to these notes should be no more than 5 pages.**

1. What specific challenges do you foresee in project execution and how would you manage them?

2. Beyond funding, why hasn't your institution already tried to execute the idea you are proposing?

3. Your project involves significant changes in faculty behavior/mindset/practice. What is your overall theory of change and understanding about how change occurs (i.e., change theory) in STEM higher education? How has this informed your approach to effective change management? (Cite sources, if applicable. Consider "Four frames for systemic change in STEM departments" by Reinholz and Apkarian, 2018.)

4. Please describe your project team's experience and success working with and supporting underrepresented students.

5. Regarding the project's goals (see p.9 and p.13 above), please provide a rationale for the metrics selected for quantitative goals (e.g., why 10% versus 20%?).[1]

## Endnotes/References

Please provide endnotes/references supporting the project's approach. Endnotes should be used for source references only; do not include substantive material in endnotes **(no limit)**.

## Additional Team Member Information

Please provide additional information on team members (i.e., statement of qualifications), not covered in the project narrative **(maximum 2 pages total for all additional team members).**

## Budget Request

Please complete the Budget Template (that will be provided on Learning Lab's website). Applicants will be asked to upload this along with the full proposal application. Please consult the Budget FAQs on Learning Lab's Grand Challenge webpage for additional instruction. **The FAQs will be in the Budget Template.**

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[1] NOTE: Short-term goals refer to goals that are achievable during the project period. Long-term goals can refer to those achieved by the end of the project or beyond the three-year project term, if your proposed project will extend past the grant term.

**Note:** Learning Lab funds are intended to be used in California. If the project necessitates the use of Learning Lab funds outside of California, provide a brief justification and estimate of the funding that will leave the state. The amount of funds that can leave the state will be subject to the final award agreement.

# VI.  Selection Process

Per statute, Learning Lab will convene an expert Selection Committee to review and evaluate proposals in the stages described above. The Selection Committee may also request an interview with all finalist teams prior to recommending awards. Learning Lab may additionally use external reviewers to provide written qualitative and quantitative evaluations of proposals to aide Selection Committee members in their review process.

The Selection Committee will make final recommendations for award to the Director of the Governor's Office of Planning and Research (OPR) for approval. Awards and final award amounts are contingent on successful negotiation of a grant agreement between the Learning Lab staff, the Foundation for California Community Colleges (administrator of the grant), and the awarded project team and host institution.

Please note: Selection Committee members and the Director of OPR will take into consideration geographic, disciplinary, and institutional diversity in order to balance the diversity of awards.

# VII.  Post Award Agreements

Applicants whose proposals are selected and approved for award will be asked to enter into an agreement with the Foundation for California Community Colleges, which is under contract with the Governor's Office of Planning and Research to administer the Learning Lab grant program. Learning Lab personnel will administer the agreement, which will address project implementation, including the following:

- **Becoming part of the Grand Challenge Cohort**: In addition to executing on project deliverables, awardees will join the Grand Challenge Cohort through which they will share ideas, approaches, findings, data, and outcomes over the three-year grant period. Grounded in their experiences, awardees will collaboratively produce, by the end of the grant period, recommendations for model first-year STEM curricula with effective pedagogical approaches and faculty professional development components built in. A coordinating institution or project team will be selected to receive $500,000 over three years to foster collaboration among grantees and serve as the Cohort Facilitator.

- **Indirect Costs:** Up to 8 percent in indirect costs are allowed; for the University of California, GAEL, UCRP, and TIF must be included in the 8 percent of indirect costs. Combined direct and indirect costs cannot exceed the award amount. Learning Lab calculates the 8 percent IDC rate based on total combined direct costs for all partner institutions and does not permit layering of IDC in excess of 8 percent of total direct costs. (Click here for more on indirect cost calculation.)

- **Budget Flexibility**: Grant agreements will have some budget flexibility; however, prior approval will be required for budget changes between approved budget categories above negotiated thresholds, and for certain activities such as travel and hosted convenings.

- **Open Educational Resources:** Institutions must agree to terms and conditions that require course and course series and technology/platforms enabled with Learning Lab funds to be available as open educational resources, as defined through the grant agreement. (See FAQs on Learning Lab's website.)

- **Start Date:** Initiate work within 30 days of signing the agreement. Grant agreements must be signed no later than 30 days after award notification.

- **Reporting:** Submit progress reports at agreed-upon intervals, including tracking of milestones and expenditures, participate in conference calls and convening activities, and seek technical assistance from the Learning Lab Advisors or Learning Lab staff. All post-award expectations will be specified in award agreements.

- **Use of Data:** Investigators and demonstration teams are expected to share data and research findings consistent with academic standards.

- **Protection of Privacy and Personal Information:** Investigators and demonstration project teams are expected to follow state and federal law to protect privacy and personal information.

# VIII.   Terms and Definitions

**Achievement, Opportunity, and Equity Gaps:** Achievement gap refers to "Any significant and persistent disparity in academic performance or educational attainment between different groups of students" ([The Glossary of Education Reform](#)) while opportunity gap refers to "The ways in which race, ethnicity, socioeconomic status, English proficiency, community wealth, familial situations, or other factors contribute to or perpetuate lower educational aspirations, achievement, and attainment for certain groups of students" ([The Glossary of Education Reform](#)).

**Equity Gap** refers to racial and gender disparities in educational access and attainment for historically underrepresented and underserved student populations that are the product of persistent social and institutional barriers to educational opportunities and educational success (Lumina Foundation and USC Center for Urban Education). From the perspective of the Learning Lab, we can understand equity gaps, in part, as the achievement gaps that opportunity gaps created. Our preferred term is to use equity gap, rather than achievement gap, in order to keep the focus on the multiple barriers to educational success, rather than on student performance alone.

**Adaptive Learning Technology:** Adaptive learning is defined by statute to mean "a technology-mediated environment in which the learner's experience is adapted to learner behavior and responses." In order to have the potential for large-scale impact, Learning Lab understands adaptive learning technologies in the broad sense of deploying technology to better understand learner experience/learner gaps and assets, and to modify learning environments, pedagogical approaches and/or available resources to produce better learning outcomes across the broad range of students.

**Host Institution:** The project's host institution is the college or university that will act as grantee and fiscal intermediary for purposes of grant administration. The host institution will enter into a grant agreement with the Governor's Office of Planning and Research for receipt and management of grant funds and will distribute funds to the partner institutions based on sub-award agreements. The designation of an institution as "host" is for grant administration purposes only. Learning Lab expects awarded projects to exhibit meaningful, well-balanced collaboration among partner institutions.

**Indirect Cost (IDC) Calculation:** Learning Lab calculates the 8 percent IDC rate based on combined project direct costs and does not permit layering of IDC in excess of 8 percent of total direct costs. Combined direct and indirect costs cannot exceed the award amount. Consequently, for a project awarded a $1 million grant, total combined IDC for all partner institutions cannot exceed $74,074 (i.e., 8 percent of total direct costs of $925,926, with combined indirect and direct costs totaling $1 million). Partner institutions may, however, divide their respective shares of IDC, as long as they conform to the Learning Lab's overall limit on IDC (i.e., no more than 8 percent of total direct costs). For instance, the host institution may apply 8 percent IDC to a portion of a sub-award, but the sub-awardee cannot then apply IDC to that same portion of the sub-award, since that would lead to total IDC in excess of 8 percent of total project direct costs.

**Intersegmental faculty team:** Intersegmental faculty team refers to a team of faculty from more than one segment of public higher education, e.g., University of California, California State University, California Community Colleges.

**Online/Hybrid Learning Environments:** Learning Lab also takes a broad view of what qualifies as an online or hybrid course. Online courses allow students to interact, either synchronously or asynchronously, with the course material/lecture/lab work, and other participants and/or instructors/TAs in a technology-mediated, remote environment. Hybrid courses or blended courses are those that use both "online" and in-person interactions as part of the formal course environment or requirements. Hybrid courses allow some component of the course to be available or accessible in an online environment. For the purposes of this RFP, a course does not have to be officially designated by the institution or department as "hybrid" to be eligible for Learning Lab grant funding, so long as it conforms to the definition above.

**Science of Human Learning:** Learning science, or the science of human learning, is the study of how human learning takes place. Interdisciplinary in nature, drawing from fields such as cognitive science, neuroscience, computer science, education, psychology, sociology, design studies and more,[6] the science of learning strives to understand how people learn, how to support learning, how to facilitate and enhance learning, discipline-based learning, and the role of technology in enhancing learning and collaboration[7]. The science of learning addresses how people process, gather, and interpret information; how they develop knowledge, skills, and expertise; and the extent to which social and physical context and design environments influence learning[8]. Scaffolding, inquiry or problem-based learning, collaborative learning, game and simulation-based learning, and metacognition are all examples of how teaching methods and approaches to curriculum can be influenced by what we understand about learning. Additionally, strategies linked to social psychology and multicultural education emphasize the importance of attending to students' identity and culture when addressing achievement gaps—we view such achievement gaps as invitations to apply the science of learning in new or improved ways.

One of the goals of the science of learning is to create a positive feedback/continuous improvement loop between theories of learning and practice, which would result in improved student learning and advance the field of learning science[4]. For the purposes of Learning Lab, as public higher education strives to educate more students with diverse backgrounds in a rapidly changing world, leveraging, increasing and applying our knowledge of human learning is a challenge we must embrace.

**Underrepresented Students:** By underrepresented, we mean historically underrepresented in STEM higher education, including Black/African Americans, Latinx, Native American, some Asian American subgroups, Pacific Islanders, and women.

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[6] Sawyer, R.K. (2006). The Cambridge Handbook of the Learning Sciences. Cambridge, U.K.: Cambridge University Press.

[7] Sommerhoff, D., Szameitat, A., Vogel, F., Chernikova, O., Loderer, K. & Fischer, F. (2018). What Do We Teach When We Teach the Learning Sciences? A Document Analysis of 75 Graduate Programs. Journal of the Learning Sciences, 27:2, 319-351. https://doi.org/10.1080/10508406.2018.1440353.

[8] Ibid.