Systemic Interventions and Policies

October 16, 2026

CLEMSON

EMPOWERS

NSF IGE PI Meeting October 16th, 2026

Co-PIs: Dr. Karen High & Dr. Julianne Wenner

Contributors: Dr. Jenny Presgraves, Dr. Randi Sims, Sofia Rodríguez Brewer, Julieta Pauer, & Courtney Luther

CENTER FOR TRANSFORMATIONAL MENTORSHIP
THE GRADUATE SCHOOL

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Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the NSF.

Outline

1. EMPOWERS Program Summary
2. Systemic Change Overview
3. Research Progress
4. Acknowledgements
5. Contact Info & EMPOWERS Website QR Code and Link

EMPOWERS Program Summary

Evaluating Mentoring Practices for Optimal Work-life balance in Education & Research in STEM graduate studies (EMPOWERS)

Program Design & Implementation





Enhanced bilateral mentorship between students & advisors

Goals & Objectives

Goal 1: Promote holistic mentorship, training, mental health and well-being, inclusion, and career and professional development.

Objective 1.1: Enhance the mental health, well-being, and inclusion of grads

Objective 1.2: Develop and iteratively improve CTM training modules

Objective 1.3: Expand engagement with Grad 360 and related professional development

Goal 2: Affect systemic change at the department, interdepartmental/college, and University levels through capacity building and policy development related to holistic mentoring.

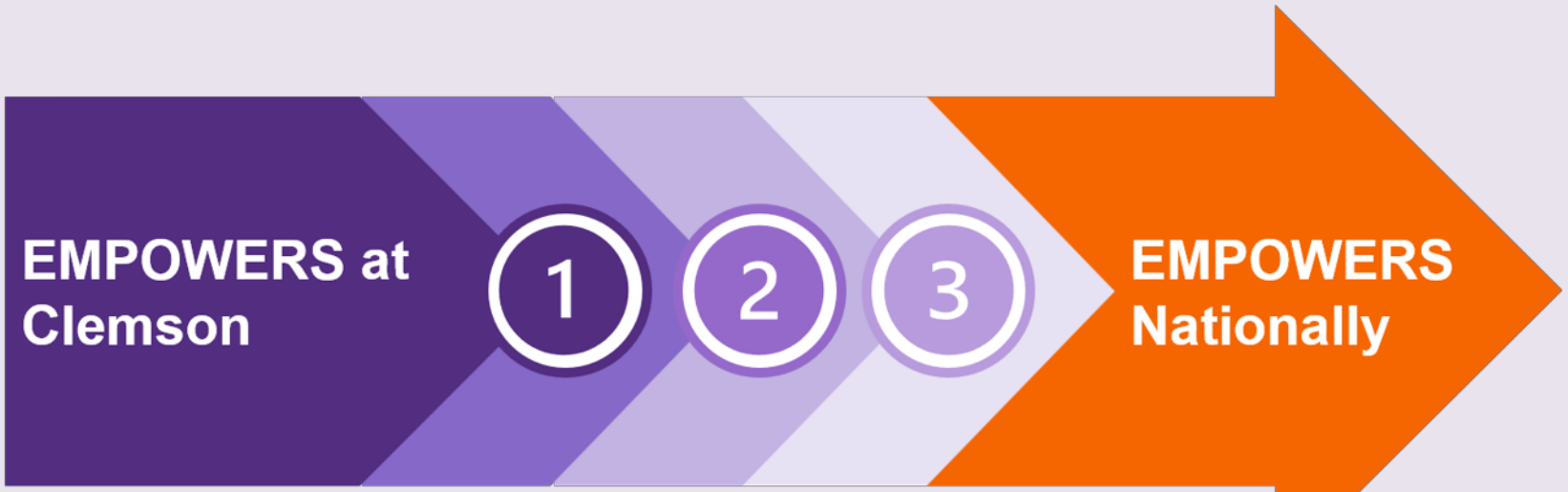
Objective 2.1: Scale participation in mentoring training among faculty and graduate students

Objective 2.2: Document and promote effective mentoring practices via inquiry across stakeholders.

Objective 2.3: Collaborate with the Faculty Senate

Objective 2.4: Collaborate with the Graduate Student Government and Graduate School leadership

Ongoing Work

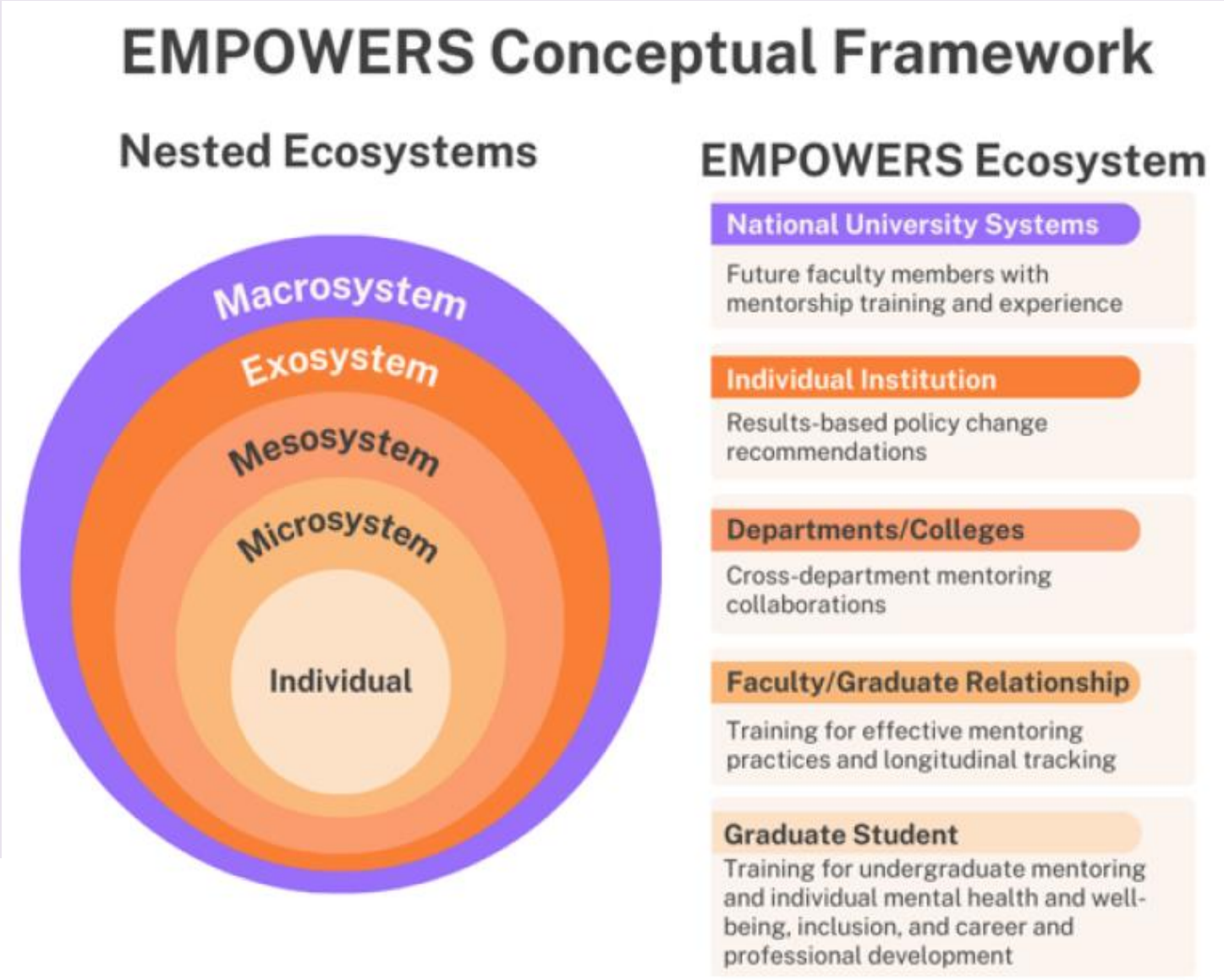


1. Partner institutions, model refinement
2. Workshops, mini-conferences, publications
3. Further Grant Funding

Systemic Change Overview

How Clemson Has Approached Systemic Change

Bronfenbrenner's Ecological Systems Theory



How Clemson Has Approached Systemic Change

EMPOWERS has built mentoring capacity and is connecting it to institutional structures.

Build capacity

CTM grew in number of modules/sessions offered; Faculty Fellows appointed.

DELIVERED

Surface system needs

Climate survey: Faculty focus groups findings point to limited or unclear mentoring expectations and recognition.

EVIDENCE GATHERED

Move toward practice

Proposed department path: awareness → deeper participation and local champions → mentoring embedded in routines, expectations, and recognition.

PROPOSED NEXT STEPS

Connect through existing entry points

Onboarding, department meetings, graduate programs, chairs, associate deans, and the Graduate School can link local mentoring activity to wider processes.

How Clemson Has Approached Systemic Change





Engagement with:

- Senior Associate Provost
- Associate Vice President for Strategic Alliances



Faculty Senate Policy:

- TPR
- Annual Appraisal
- Faculty Manual



Connections with:

- Academic Colleges
- Associate Deans (Faculty Affairs
- Department Chairs

How Clemson Has Approached Systemic Change







canvas

Making Mentoring Change Last

Embed in routines

Onboarding, GTA training, doctoral seminars, department meetings and retreats

Distribute leadership

FLC members grow into co-facilitators, resource builders, and local champions

Sustained mentoring practice

Keep tools usable

Canvas resources, short videos, micro-sessions, and flexible access

Recognize and measure

Track application, departmental activity, policy or process change, feedback, and persistence

Research Progress

Research/Evidence That Has Informed Our Understanding of the Problem and the Interventions We Chose

- Graduate education builds capacity in research and practice.
- There have been historically alarming attrition rates in graduate education, partially due to ineffective mentoring.
- "Holistic mentoring" can be defined as a bidirectional relationship over time that supports the personal and professional growth, development, and success of both partners through a variety of supports
- Theoretical Frameworks:
  - Bronfenbrenner's Ecological Systems Theory (EST) to consider the nested contexts with which individuals interact
  - Kezar and Eckel's Cultural Framework for Institutional Change to consider key components of change at the university level

What Our Research Tell Us About Whether or How the Intervention is Working

Participants perceive the CTM as valuable

- Graduate students: 4.37/5 average session-value rating *(n = 228)*
- Faculty:4.26/5 average session-value rating *(n = 171)*

How mentoring appears to be changing

- Graduate data highlight communication, expectation setting, use of distributed mentors, & mentoring navigation for different needs.
- Interactive, case-based activities are consistently identified as useful.

Institutional change is still emerging

- Faculty data reveal unclear mentoring expectations, limited formal training, + a need for practical mentoring resources

Acknowledgements

National Science Foundation

This project is funded by the National Science Foundation, Award # DGE-2429719

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With special thanks to the EMPOWERS advisory board, participating faculty, and graduate students.

Contact Info & EMPOWERS Website



Dr. Karen A. High
EMPOWERS Principal Investigator
khigh@clemson.edu



Dr. Julianne Wenner
EMPOWERS Co-Principal Investigator
jwenner@clemson.edu

bit.ly/EMPOWERSWebsite

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Transforming Graduate STEM Education

A Study of a Data Science and AI Credential for STEM Doctoral Students

Joanna Schiffman, Principal Investigator

THE UNIVERSITY OF CHICAGO
DATA SCIENCE INSTITUTE

Outlier Research & Evaluation
NSF Award #2429605

The team

THE UNIVERSITY OF CHICAGO
DATA SCIENCE INSTITUTE



Joanna Schiffman

Principal Investigator

Director, Outlier Research & Evaluation

jschiffman@uchicago.edu



Dan Nicolae

Co-Principal Investigator

Distinguished Service Professor, Statistics and Human Genetics; Faculty Co-Director, Data Science Institute



David Uminsky

Senior Personnel

Executive Director, Data Science Institute



Huifang Zuo

Senior Personnel

Research and Evaluation Associate, Outlier



Dana Elobaid

Senior Personnel

Research Assistant, Outlier

The program in brief

The credential

A two-year PhD certificate in data science and AI for University of Chicago doctoral students in STEM fields outside data science.

The study

An NSF IGE Track 2 project (2024 to 2029) across STEM fields in one institution. It studies the credential's role in students' research, their careers, and culture across departments.

Part	What students do
Courses	Year 1: data science, ML and AI, responsible use
Practicum	Year 2: apply the methods in their own research
Cohort	Lunch and Learns and a closing symposium

Where we are: year 3 of 5

Cohort 1 (6 students) completed the courses and is in its practicum year. Cohort 2 (8 students) began the courses this autumn. The certificate is expected to become an official University of Chicago credential next month.

What informed the design

Evidence	Design choice
Data science and AI were becoming essential in every field, but STEM PhD training was scarce	A credential for PhD students outside data science
Graduate data science programs had multiplied, but most were master's degrees	Three courses built for use in research
Interdisciplinary training can add a second field to a home discipline (McKee et al., 2021)	A practicum in the student's own research
Siloed departments hold back interdisciplinary work (Cassel & Topi, 2016)	Cross-departmental cohorts, with chairs and advisors nominating students

Sources as cited in the proposal (written 2023). Program counts: Institute for Advanced Analytics, 2023.

Question 1: What evidence informed the problem and the intervention?

How the problem has changed since 2023

Since we wrote the proposal in 2023, AI has become part of how students learn and work. Every course now changes from year to year, so the program has to be built to keep adapting.

Introduction to Data Science

AI can complete graded homework, so the course needs other ways to ensure learning.

Foundations of ML and AI

Content has to keep pace with how quickly AI methods and tools are changing.

Responsible Use of Data and Algorithms

Content keeps changing as students' access to AI, and use of it, changes.

Question 2: How is the evaluation shaping improvements and next steps?

What we learned from students in year 1

Who the students are

- They come from a wide range of fields, and even students in one department use very different methods
- They start with some familiarity with data science and AI, and hope to use both extensively
- They want research careers, and are as interested in industry as in academia

What year 1 gave them

- New AI and machine learning methods for their research
- More confidence and a clearer view of careers
- Conversations with advisors and students in other fields
- A wish for more time with each other and with industry

From the cohort 1 pre-survey, course feedback, and case study interviews. Not outcome findings.

Question 2: How is the evaluation shaping improvements and next steps?

What we changed for year 2

What we learned	What we changed
Students come from many fields and want to learn from each other	Lunch and Learns with more voices: short student talks and journal clubs
They are weighing research careers in industry and in academia	A visiting speaker each quarter. Recommended: industry and career speakers
The courses sit on top of research and teaching	**Policy change:** a course can be deferred a year, or replaced by a similar course a student has already taken.

Sources: cohort 1 pre-survey, course feedback, and case study interviews.

Question 3: What questions remain unanswered?

Questions we can't answer yet

1. How will the program shape students' research and the careers they pursue?

2. What data science and AI skills will scientists need by the time these students enter the workforce?

3. How can we better reach students and their advisors when AI is such a hot and controversial topic?

4. How do we design a program that keeps evolving as the field changes, without reinventing it every year?

Looking ahead: How do we scale the program to more students, and beyond the biological and physical sciences, while still meeting each student's needs?

Joanna Schiffman · jschiffman@uchicago.edu

CSU
WARM

The California State University
Wellbeing Alliance for Research Masters



Harold Stanislaw, PhD
California State University, Stanislaus

Innovations in Graduate Education PIs' Meeting
October 15-16, Washington, DC

Thanks to the WARM team!

CSU WARM
Wellbeing Alliance for Research Masters
Chancellor's Office · East Bay
Los Angeles · Northridge · Stanislaus

- Ross Avilla, PhD (Evaluator)
- Matthew Cover, PhD (CSU Stanislaus)
- Gabriela Chivara, PhD (CSU Northridge)
- Frank Gomez, PhD (CSU Chancellor's Office)
- Jessica Morales-Chicas, PhD (CSU Los Angeles)
- Amanda Morrison, PhD (CSU East Bay)
- Yvette Szabo, PhD (CSU Los Angeles)



U.S. National Science Foundation
Award 2429971

WARM in one slide

CSU WARM
Wellbeing Alliance for Research Masters
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- Focuses on **student wellbeing** and **psychosocial variables** in STEM graduate research programs at four HSIs (IGE Track 2)
  - **Wellbeing** is defined as mental health and hedonic and eudaimonic wellbeing (energy, direction, belonging, and joy)
  - **Psychosocial variables** include science self-efficacy, imposter syndrome, grit, and sense of belonging
- Main research questions:
  - How do **graduate program features** relate to wellbeing, psychosocial variables, and academic success?
  - Can a **smartphone app** improve wellbeing, psychosocial variables, and academic success?
  - Can **targeted interventions** improve wellbeing, psychosocial variables, and academic success?

Programs and students served by WARM

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	CAL STATE EAST BAY	CAL STATE LA, CALIFORNIA STATE UNIVERSITY, LOS ANGELES	CSUN, CALIFORNIA STATE UNIVERSITY NORTHRIDGE	CALIFORNIA STATE UNIVERSITY Stanislaus
Programs (all Master's)	Biology Chemistry Computer Science Engineering Environmental Sci Statistics	Biology Computer Science Engineering Environmental Sci Geology Industrial Mgmt Mathematics Psychology	Biology Computer Science Data Science Engineering Environmental Sci Geology Industrial Mgmt Mathematics Physics Psychology	Biology Psychology
Students	245	700	594	76

Evidence sources

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- Institutional data
  - How should expected time to completion be defined?
  - How should academic standing be tracked after coursework is completed?
- Smartphone app that allows wellbeing to reported every day in just seconds
  - Dashboard allows longitudinal tracking of wellbeing
- Once-per-semester survey that assesses mental health and psychosocial variables
  - Comprehensive – more than 100 items

Approaches to systemic change

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- **Shine a light on California State University graduate student outcomes**
- The CSU enrolls over 43,000 graduate students (9% of total enrollment)
- Average degree completion rate for each program = ???
- Average time to completion = ???



- Goal = CSU graduate student success analytics dashboard
- Leverage/sustainability:
  - Undergrad dashboard is portable and can be licensed by other institutions
  - Chancellor's Office contacts



Approaches to systemic change

CSU WARM
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- **Highlight wellbeing as both a predictor and outcome of academic success**
- 37% of college students reported moderate or severe depressive symptoms; 11% reported suicidal ideation in the past year (Healthy Minds study, 2024-25)
- Improving wellbeing accelerates degree completion (we think)



- Goal = Report wellbeing stats in IPEDS and marketing materials
- Leverage/sustainability:
  - Supporting wellbeing fosters alumni engagement (we hope)
  - Wellbeing resources don't need to be expensive; some already exist on most campuses

Approaches to systemic change

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- **Provide graduate students with a voice**
- *Nihil de nobis, sine nobis* ("Nothing about us without us")
- Graduate students are being trained to offer unique perspectives and innovative solutions – give them space and agency to practice this



- Goal = Graduate student councils on each campus
- Leverage/sustainability:
  - Finding students to join a council isn't difficult
  - Councils don't need to cost anything (but it's nice to acknowledge participation)

Thank you!



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SUPPORTING GRADUATE STUDENT WELLBEING IN STEM

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Join an NSF-Funded Research Initiative

Graduate school is a time of intense growth amid significant stress. This NSF-funded project seeks to understand and improve the mental health and wellbeing of master's level students in STEM fields. By exploring student experiences across STEM disciplines, the Wellbeing Alliance for Research Masters (WARM) collaborative team aims to identify factors that support resilience, belonging, and program completion.

Why WARM?

- Semesterly wellbeing and progress assessment
- A wellbeing app for mental health support
- Student-led advisory council (nominate here)
- Evidence-based interventions

Your Involvement Matters!

Your involvement will help ensure that WARM creates sustainable, evidence-based practices that can be shared across campuses to enhance graduate student success. We invite you to join us for an information session to learn how you can support this critical initiative through **encouraging students to participate** (and earn some money for their time), **nominating graduate students** to serve on the graduate council, and **contributing your expertise** in program development and student support.

Information Session (Zoom)

Friday November 21st
2:00pm – 3:00 pm (PT)
https://csustan.zoom.us/j/81258149753

Contact

Harold Stanislaw, Ph.D.
Department of Psychology
Email: hstanislaw@csustan.edu
Matthew Cover, Ph.D.
Department of Biological Sciences
Email: mcover@csustan.edu

Stanislaus State



CSU WARM Wellbeing Alliance for Research Masters

PARTICIPANTS NEEDED:

For an online survey about mental health, wellbeing, & graduate school

QUALIFICATIONS:

You must be:

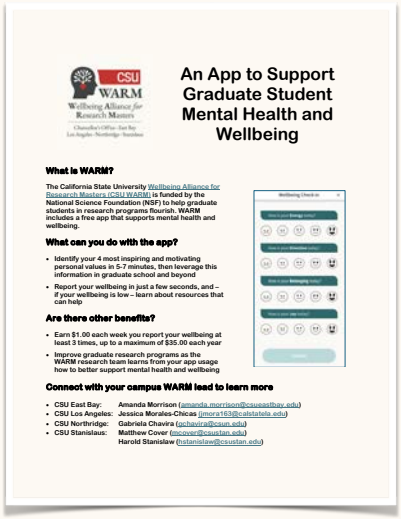
- ☑ A graduate student at Stan State
- ☑ Enrolled in a research-focused graduate program

WHAT TO EXPECT:

- ☑ The survey will take about 20-30 minutes to complete
- ☑ Survey topics include: experiences in graduate school, mental health, and wellbeing
- ☑ You will receive a $20 gift card for participating. The amount increases each time you participate.
- ☑ You will receive an invitation every semester

Check your university email for a survey invitation!

Contact: Dr. Harold Stanislaw at hstanislaw@csustan.edu



CSU WARM Wellbeing Alliance for Research Masters

An App to Support Graduate Student Mental Health and Wellbeing

What is WARM?

The California State University Wellbeing Alliance for Research Masters (CSU WARM) **is funded by the National Science Foundation (NSF) to help graduate students in research programs flourish. WARM includes a free app that supports mental health and wellbeing.**

What can you do with the app?

- **Identify your 4 most inspiring and motivating personal values in 5-7 minutes, then leverage this information in graduate school and beyond**
- **Report your wellbeing in just a few seconds, and – if your wellbeing is low – learn about resources that can help**

Are there other benefits?

- **Earn $1.00 each week you report your wellbeing at least 3 times, up to a maximum of $35.00 each year**
- **Improve graduate research programs as the WARM research team learns from your app usage how to better support mental health and wellbeing**

Connect with your campus WARM lead to learn more

- **CSU East Bay:** **Amanda Morrison** (amanda.morrison@csueastbay.edu)
- **CSU Los Angeles:** **Jessica Morales-Chicas** (jmora163@calstatela.edu)
- **CSU Northridge:** **Gabriela Chavira** (gchavira@csun.edu)
- **CSU Stanislaus:** **Matthew Cover** (mcover@csustan.edu)
  Harold Stanislaw (hstanislaw@csustan.edu)