Science of Learning Research Center

UC San Diego

“I don’t believe in this business of being behind, better to be in front.”

- Mel Brooks

Our society emphasizes *restoring* mental and physical health, but we do not do enough to **"get it right in the first place"** by understanding what it is that each child needs to learn and flourish.

- *Andrea Chiba*
Professor, Cognitive Science
UC San Diego

This is the Challenge we will meet:

Lead the way for the Science of Learning –

for the World

Center Leadership - Executive Committee

We invite you to join us at the forefront of the Science of Learning – exploring boundless opportunities to make an impact on our world!

Why is the Science of Learning Important?

"Many lament our current education systems were set up like factories, a model that fit the 20th century. Technologies have made the traditional model of teaching obsolete.

The relatively young field of learning sciences draws from multiple disciplines to study the ways in which people acquire knowledge, skills, and competencies and to answer the questions of *why* some strategies for learning work better or worse than others – and also *how* they work in the real world."

From "Science of learning: Why do we care?"
by Helyn Kim, Eileen McGivney, and Esther Care
Brookings Institution, March 2017

Our Vision

In seven to ten years, we will significantly advance the science of learning.

We will establish a pipeline from basic science to scalable tools for enhanced learning, which will have measurable, sustainable, and lasting impact on the next generation of education, machine learning, artificial intelligence and health.

Who we are: Our Values

Trust

#1 for a reason

Creativity

The spark that ignites new ideas and the best science

Boldness

Moving beyond the cutting edge, willing to trust, share, persist

Determination

To discover and provide scientific proof

Collaboration

Blurs the lines between established disciplines to focus on discovery

Integrity

In all that we endeavor

Community

Diverse, inclusive, and intergenerational for rich, productive, powerful science and translatable discovery

Where we come from: Science of Learning

at **UC San Diego**

2006-2017

$70 million NSF Center funded research known as the Temporal Dynamics of Learning Center (TDLC)

Result -> Vast research portfolio of remarkable discoveries and an ingenious, effective community of scientists

How we work:
An Interdisciplinary Approach

Our teams include:

- Neuroscientists
- Cognitive Scientists
- Educators
- Psychologists
- Computer Scientists
- Bioengineers
- Machine Learning Experts

Why a *Center* of Research is Important

It is a bold move for accomplished scientists to share their very best ideas for scientific discovery and development of technology with their network of expert colleagues.

Why do they do so?

Our scientists recognize that the group vision, the whole, is greater than the sum of its parts. More science. Greater impact.

This is the culture of our Science of Learning Research Center.

What we will work on:
Center Scientific Initiatives

- **Optimizing Learning and Memory**
- **Technology for Learning**
- **Music and Arts: Foundations for Learning**
- **International Educators Network**
- **Deep Learning to Understand the Brain**

Center Scientific Initiatives

Optimizing Learning and Memory

Spacing practice and testing for optimal retention

Best practices for optimal retrieval

Modalities for learning

Learning how to learn

MOOCS

Technology for Learning

Neurogaming Center

Basic Science of adaptive learning

Leveraging behavior to change the brain

Restoring and augmenting capacities in the face of a changing world

Social robots for learning

Music and Arts: Foundations for Learning

Building rhythms for lifelong learning

Foundations of learning

Addressing rhythmopathies

Understanding the benefits of cultural practices

From the millisecond to decades: Nested timescales of our lives

International Educators Network

Synthesis and coordination

Distinguished Educators Advisory Panel

Infrastructure for translation to education

Global policy for education and learning

Deep Learning

Algorithms for learning

Big data analytics for learning

Optimal Control Theory for autonomous learning

Information theory

Neuromorphic engineering

Timeline and Budget

YEAR 1: Scientific research level of 28 Labs	$10M
YEARS 2-4: Research growth to 40 Labs	$25M
YEARS 5-7: Launch scalable programs	$30M
YEARS 8-10: Focus on translation	$35M
TOTAL	**$100M**

What will Philanthropy do?

- ✓ Increase depth and breadth of science
- ✓ Increase translation; speed up direct application
- ✓ Create data repository of student learning
- ✓ Continue upward trajectory of international collaboration
- ✓ Scale educator network to national level
- ✓ Train next generation of interdisciplinary scientists

Importantly:

Answers the central questions of how learning works and how to optimize that learning in the real world.

With Philanthropy –
This is the Challenge we will meet:

Lead the way for the Science of Learning –

for the World

From all of us in Science of Learning Research at UC San Diego –
We invite you to join us!
Thank you!