Challenges/Values/Efforts

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with

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TPSE seeks to provide connective tissue which encompasses efforts in transforming post-secondary education in mathematics.

- **Who** are we teaching? One size does not fit all!
- **Why** do our students need mathematics?
- **What** changes in curriculum are suitable for those needs?
- **How** can teaching methods improve student outcomes?
TPSE seeks to offer a framework for discussion of challenges to us, the teachers of post-secondary mathematics.
Why Now?

FORCES for CHANGE have aligned as never before!
Change in the backgrounds and interests of our students

U.C. Merced

Yale in 19th C.
Economic value

More than ever before
Public colleges and universities have been coping with growing costs and enrollments, along with declining state support. More bureaucracy compounded with more student services. Past tuition increases are not sustainable.
How does mathematics contribute to society?
IMPACT is everywhere

- Physics and Engineering
- Economics and Finance
- Communications/Coding
- Data Sciences
- Math in the Biological Sciences
- Math in the Medical world
- Math in every day life.
Our students NEED MATHEMATICS.

Our challenge is to EQUIP them with the math they need.
During the past 40 years, we academics have been lulled into a sense of **complacency**.

**Teaching loads** for many dropped, **salaries rose**, and **public support** for science seemed assured.
Wake-up!
ALLIES for CHANGE!

- Financial pressures on economic model for education.
- Newer learning techniques.
- New technology.
- Exhortations from PCAST.
- Heightened awareness of Math Societies.
- Encouragement of federal agencies and non-profits.
Many strands and strata

We must raise the level of mathematical understanding and career-appropriate skills throughout the academic landscape.

ONE SIZE DOES NOT FIT ALL!

Nevertheless, this applies to education in K-12, 2-year colleges, 4-year colleges, and universities.

This applies to students entering MATH intensive careers, to all who will become thoughtful members of society.
Values that we MUST PRESERVE:

- **Dedication** to the well-being and future of our students.
- **Diversity** in all its forms in our mathematical community.
- **Encouragement** of mathematically **talented** youth.
- **Intellectual** honesty and rigor.
- **Sustenance** of **basic research** in the mathematical sciences.
Challenges

A.) Revision of pathways leading to higher retention and completion, especially for underprepared students.

B.) Reform and Enrichment of curricula, especially in the first two years of college mathematics, suiting the changing landscape of mathematics-intensive subjects.

C.) Increased cooperation with other disciplines to better support STEM and other careers of our students.

D.) Revisions of teaching methodology leading to more engagement by our students.

E.) Revisions of graduate training in light of changes in the professoriate.
MAJOR GOAL: Foster local innovations, then translate these to large scale improvements.

Increase CAPACITY for change.

Expand NETWORK for change.
Possible activities for TPSE

COMMUNICATE, COORDINATE, PROMULGATE, EVALUATE

- Leverage support from governments and foundations to foster reform.
- Highlight successful innovation.
- Networks of concerned leaders, especially chairs.
- Liaison with Societies, Government, and Foundations.
More steps

Specific Projects.

- **Templates** for *Convenings*: institutional, regional, state levels.
- New curriculum materials.
- Improved evaluation schemes.
- Data on direct economic benefit of mathematics to society.
- Certificates for excellence.
Renewal of teaching methodologies

**HOW** should we improve our educational outcomes?

How to *incentivize and incorporate* new modes of teaching?
Lot’s to do

We have BIG challenges before us!
Let us **EXCHANGE** our ideas and **CHANNEL** our efforts in order to improve mathematics education for all our students.

THANK YOU!