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Developing a STEM Teacher Recruitment Pipeline

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Developing a STEM Teacher Recruitment Pipeline

Dr. Kimberly Shaw, Dr. Cindy Ticknor, Dr. Tim Howard
Columbus State University

8 March 2013

Abstract

The Columbus Region Academy of Future Teachers of STEM (CRAFT-STEM), a Phase I Robert Noyce Teacher Scholarship Program, combines internships and scholarships, an exciting summer STEM Honors Camp, a new Teaching Connections Seminar, and an impressive array of existing resources to recruit, prepare, and graduate an increasing number of STEM teachers committed to serving high need high schools.



STEM Education at CSU

- Currently, CSU educates at least 60% of the area's teachers.
- However, Georgia produces very few teachers in certain areas of STEM, consistent with national trends.
- CSU has mirrored this trend.
- High teacher attrition rates exacerbate the problem: over half leave within 5 years.
- What can CSU do to change this equation?

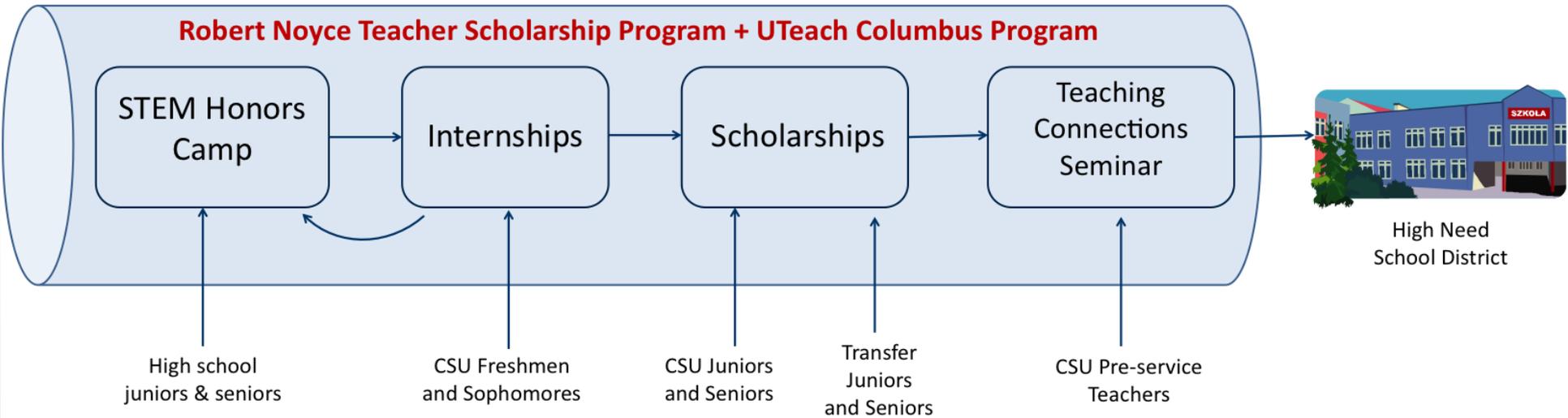




CRAFT-STEM

The Columbus Region Academy of Future Teachers of STEM (CRAFT-STEM) is an NSF Robert Noyce Teacher Scholarship program (funded with grant number 1136356). Program components include a STEM Honors Summer Camp engaging high school juniors and seniors in STEM research and activities, \$4500 summer internships for CSU freshmen and sophomores, and scholarships worth \$10,000-13,000. This five year grant is worth approximately \$1.2 million.

Robert Noyce Teacher Scholarship Program + UTeach Columbus Program





STEM Honors Camp

- Two week experience, competitive nomination process for rising high school juniors and seniors. Vehicle to recruit talented students to STEM majors at CSU.
- Participate in authentic research with faculty and interns
- Experience life on CSU campus
- Speaker series – Careers or issues in STEM
- Field trips
- Student colloquium – students present their research projects to other camp participants, parents and faculty.
- Loosely based on successful Academy of Future Teachers camp held several years ago
- Directive from Dr. Mescon – make it a residential camp!





What is UTeach?

- Collaborative effort by College of Letters and Sciences, and College of Education and Health Professions
- Replication of nationally recognized Texas program for STEM teacher preparation
- Focus on strong content knowledge, exposing students to research in their field
 - Graduates have majors in math or science, and are eligible for teacher certification.
- Re-design/streamline of education courses to focus on STEM
- Aggressively recruit students to teaching math and science
- **Critical to success:** Master Teachers, to teach/co-teach field experience classes and mentor students



Student Recruitment

- Publicity
 - Logo, bookmarks, brochures, fliers, letters, e-mails, giveaways
 - Posters around campus
 - Articles/ads in Ledger-Enquirer, Saber, Impact
 - Word of mouth
 - Web site: <http://uteach.columbusstate.edu/>
 - Facebook page: <http://www.facebook.com/UTeachColumbus>
- Visits to introductory math and science courses and Freshman Learning Communities
- Freshman orientation activities, Visitation Day
- Meetings with high school principals
- STEM Honors Camp
- Tuition rebates for Step 1 and Step 2 classes!



Early and Intensive Classroom Experiences



Step 1: Inquiry Approaches to Teaching

Step 2: Inquiry Based Lesson Design

Classroom Interactions



Streamlined Courses – Rollout Plan

UTeach Course	First Semester Offered	Instructor
Step 1: Inquiry Approaches to Teaching	Spring 2012	Master Teachers
Step 2: Inquiry-Based Lesson Design	Fall 2012	Master Teachers
Knowing and Learning in Math and Science	Fall 2012	Hrepic or Peker
Functions and Modeling	Spring 2013	Howard and Jones
Classroom Interactions	Spring 2013	Gober and Sinkule
Perspectives in Math and Science	Summer 2013	Van Kley
Project-Based Instruction	Fall 2013	
Research Methods	Fall 2013	Shaw
Apprentice Teaching	Spring 2014	



UTeach Columbus Enrollment Targets

Based on conservative assumptions, we developed the following enrollment targets for students entering the UTeach Columbus program, as well as targets for enrollment in Step 1 and Step 2 courses.

At the <u>end</u> of	Enrollment target	Actual enrollments to date
2012	39	40
2013	80	56 students 72 seats
2014	138	
2015	209	
2016	251	

Enrollment Updates

- In Fall 2012, we had 40 students enroll in UTeach courses, meeting our target.
- In Spring, we have approximately 56 individual students enrolled in at least one class, and 70 “seats” filled in classes.
 - Step 1 class: 35 enrolled
 - Step 2 class: 16 enrolled
 - Knowing & Learning: 10
 - Functions and Modeling (Math Ed only): 5
 - Classroom Interactions: 4
- There are also several students not enrolled in a UTeach class who intend to enroll in another next term.



Student Demographics

- Gender:
 - 21 males, 35 females
- Ethnicity
 - 33 white, 20 black, and 3 Asian
- Majors
 - 16 math
 - 20 biology
 - 4 chemistry
 - 8 earth and space science
 - 2 middle grades
 - 1 pre-nursing, 1 early childhood, 1 computer science, 1 marketing, 1 engineering, 1 information technology





CRAFT-STEM Scholarships

- CSU students in STEM Education majors in their junior or senior year are eligible for scholarships.
 - Minimum scholarship \$10,000. Can award up to \$13,000, based on financial need and merit criteria.
 - For each year of scholarship, students commit to teaching STEM in a high-needs school district for two years, within eight years of graduation.
- Awardees required to participate in the “Teaching Connections Seminars”
 - Participants have been exploring connections between high school curricula and college math and science courses.
 - This semester, we are also discussing the opportunities and challenges of teaching in high needs schools.



U Teach Scholarships

- Each semester, we have a few \$1000 scholarships to award
 - Must have completed Step 1 class
 - Only eligible once per calendar year
- Funded by
 - Race To The Top grant
 - Private donations
 - Gift from AT&T



CRAFT-STEM Internships

- Any CSU freshman or sophomore can apply for *summer* internships.
 - Preference given to STEM and STEM education majors.
 - Competitive application process.
 - Students will work to design and organize STEM Honors Camp, carry it out with supervision from mentor faculty.
 - Afterward, will work on research, on tutoring or peer instruction, in outreach facilities and with other STEM related camps.
- Internship pays \$4500 over the summer.
 - Interns expected to work ~ 400 hours.



UTeach Internships

- Work with outreach centers (such as Oxbow Meadows) in STEM education efforts
- Work on PR for UTeach and CRAFT-STEM programs
- Future efforts?
 - Tutoring programs in local after school programs

Homeschool Internships

- Middle School students in Columbus area
- Attend lab-only class every week, or every other week, at CSU
- Labs designed as 5E inquiry lessons



Any Questions?



UTeach Columbus

Race To The Top funding levels

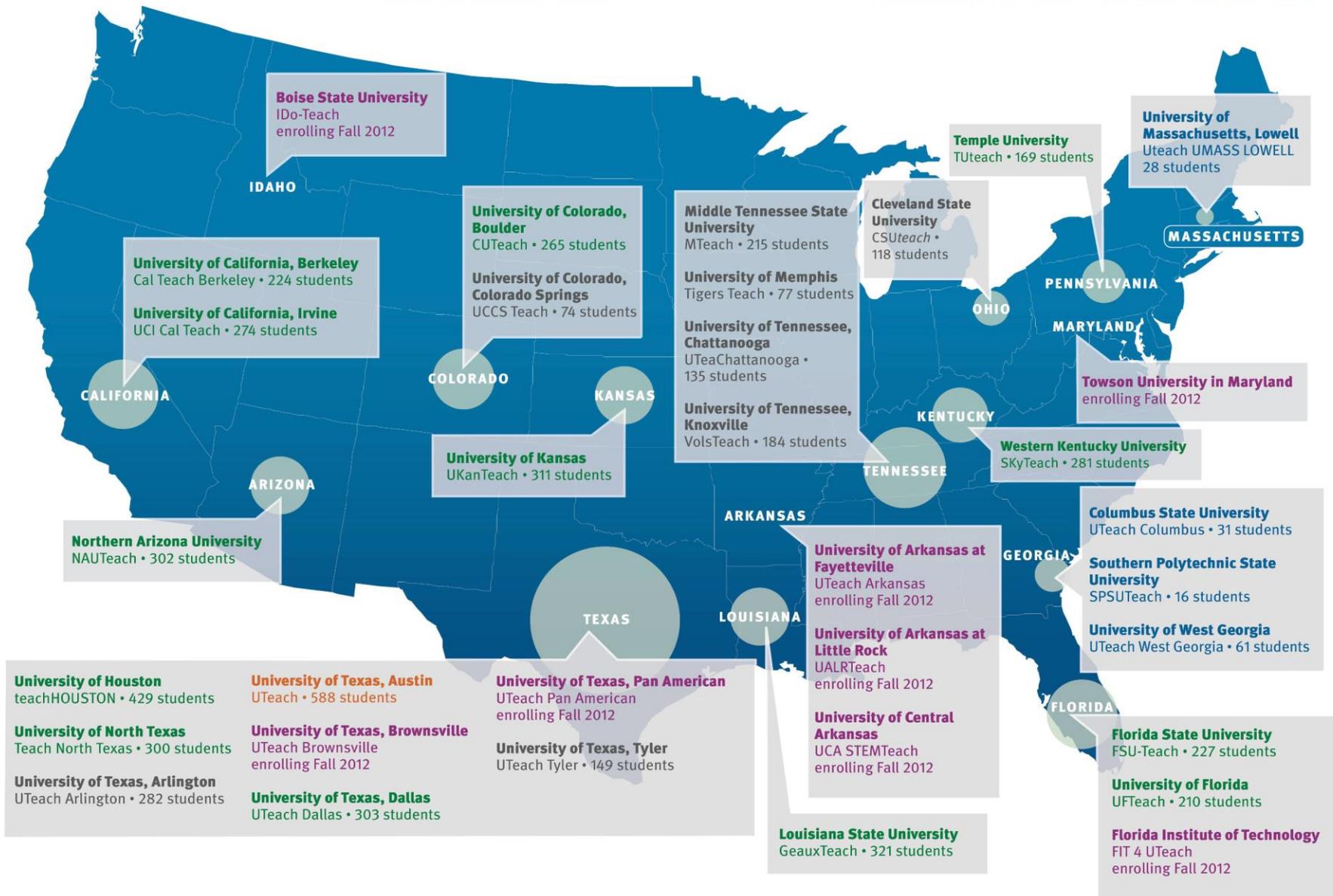
Funding periods	Potential grant amounts	Funds for Institute Technical assistance	Total funds awarded
Sept – Dec 2011	Up to \$100,000	\$100,000	Up to \$200,000
2012 operations	Up to \$250,000	\$100,000	Up to \$350,000
2013 operations	Up to \$350,000	\$100,000	Up to \$450,000
2014 operations	Up to \$350,000	\$100,000	Up to \$450,000
2015 operations	Up to \$350,000	\$100,000	Up to \$450,000
Total	Up to \$1,400,000	\$500,000	Up to \$1,900,000

Long-term Goal: Build an endowment that, together with University and grant support, will make this program self-sustaining when this grant funding ends.

Universities Replicating UTeach

Spring 2012 enrollment nationwide (5,574 students)

COHORT 1: 2008–2012 COHORT 2: 2010–2014 COHORT 3: 2011–2015 COHORT 4: 2012–2016



UTeach Program Enrollments Spring 2012

