What is UTeach?
A Secondary Math and Science Teacher Preparation Program

Larry Abraham - Co-Director, UTeach at UT Austin
Elisa Stone – Co-Director, Cal Teach Berkeley

UTeach Conference
May 2017
History of the UTeach Program

In 1997, Mary Ann Rankin, then Dean of the College of Natural Sciences, launched UTeach — an innovative program for preparing math and science teachers.

Dean Rankin with former astronaut Bernard Harris during the 10th Anniversary celebration of UTeach
1997 Myth vs. Reality at UT Austin

- Elite science and math students are not interested in teaching careers.
  Actually when UT surveyed science and math students, 25% had seriously considered teaching as a career but had been discouraged by parents, classmates, or professors.

- Training teachers is the sole responsibility of Colleges of Education.
  Colleges of Science have a responsibility to become engaged and find solutions in math/science education AND will directly benefit from that solution.

- Colleges are unwilling to cooperate in creating a joint program, so why should we bother?
  It is possible to create a win/win situation that will elicit full cooperation and leadership from both Science and Education.
1997 Myth vs. Reality at UT Austin

- Science/Math research faculty do not value and would not/could not participate in a teacher training program.
  Science/Math faculty are full and proud participants in UTeach at UT Austin. Some accomplished research faculty chose UT over competing offers BECAUSE of the ability to participate in UTeach.

- All you really need to be a great teacher is knowledge of your discipline. Education courses are a waste of time.
  Professional development courses based on current research in learning sciences is critical to developing strong, well prepared teachers AND it needs to be focused on student learning in mathematics and science.
https://www.youtube.com/watch?v=wCbMleauzmg
UTeach Austin Program Statistics
UTEACH AUSTIN ACTIVE ENROLLMENT

- 1997–98: 48
- 1998–99: 110
- 1999–00: 195
- 2000–01: 277
- 2001–02: 324
- 2002–03: 362
- 2003–04: 430
- 2004–05: 455
- 2005–06: 423
- 2006–07: 395
- 2007–08: 419
- 2008–09: 420
- 2009–10: 521
- 2010–11: 506
- 2011–12: 518
- 2012–13: 479
- 2013–14: 447
- 2014–15: 403
- 2015–16: 450
- 2016–17: 398
UTEACH AUSTIN GRADUATES: PERCENTAGE ENTERING TEACHING

- 2000-2001: 97%
- 2001-2002: 89%
- 2002-2003: 87%
- 2003-2004: 89%
- 2004-2005: 87%
- 2005-2006: 90%
- 2006-2007: 81%
- 2007-2008: 87%
- 2008-2009: 88%
- 2009-2010: 80%
- 2010-2011: 83%
- 2011-2012: 78%
- 2012-2013: 87%
- 2013-2014: 82%
- 2014-2015: 85%
- 2015-2016: 85%
UTEACH AUSTIN TEACHER RETENTION: PERCENTAGE EMPLOYED IN K–12 SCHOOLS

YEAR ENTERED TEACHING

2000-2001: 47%
2001-2002: 48%
2002-2003: 62%
2003-2004: 50%
2004-2005: 60%
2005-2006: 51%
2006-2007: 61%
2007-2008: 65%
2008-2009: 64%
2009-2010: 77%
2010-2011: 54%
2011-2012: 67%
2012-2013: 79%
2013-2014: 94%
2014-2015: 95%
2015-2016: 100%
What Distinguishes the UTeach Model?

Underlying Philosophy

I. To **eliminate barriers** in order to attract and retain the widest range of the brightest science, mathematics, engineering, and computer science students into teaching careers.

II. To **provide a high-quality teacher preparation experience**.
What Distinguishes the UTeach Model?

- Extensive, Individualized Coaching and Support
- Intensive Teaching Opportunities
- Relevant Content
UTeach Elements of Success

1. Distinctive Program Identity
2. Cross-College and School District Collaboration
3. Long-Term Institutional and Community Support
4. Compact and Flexible Degree Plans
5. Active Student Recruitment and Support
6. Dedicated Master Teachers
7. Rigorous, Research-Based Instruction
8. Early and Intensive Field Experiences
9. Continuous Program Improvement
1. Distinctive Program Identity

- UTeach has a department-like status in the College of Natural Sciences, with dedicated classrooms and office space.
- Comprehensive UTeach website and program is actively promoted through a variety of promotional materials.
- No competing undergraduate programs.
2. Cross-College and School District Collaboration

Program Co-directors

College of Education co-director and College of Natural Science co-director

Champions of the program who represent both colleges in shared decision-making

- Presentations and community building with students, faculty, administration, and potential donors.
- Dealing with day-to-day details of program effectiveness.
- Communicating “What Is UTeach?” to all audiences at local, state, and national level.
2. Cross-College and School District Collaboration

Steering Committee

Administrative body that provides oversight and makes policy decisions for the program

- Primary formal mechanism for regular contact between the faculty and staff from colleges of education, natural sciences, liberal arts and engineering.
- Co-directors are co-chairs.
- Meets regularly (bi-weekly).
## 2. Cross-College and School District Collaboration

### UTeach Team at UT Austin

#### College Administrators
Dean Linda Hicke, College of Natural Sciences  
Dean Manuel Justiz, College of Education

#### Co-Directors
Michael Marder, Physics  
Larry Abraham, Kinesiology

#### Associate Co-Directors
Mark Daniels, Mathematics  
Jill Marshall, Science Education

<table>
<thead>
<tr>
<th>CNS Staff</th>
<th>Education Faculty</th>
<th>Master Teachers</th>
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<tbody>
<tr>
<td>Mark Tway, Equipment Manager</td>
<td>Larry Abraham, Kinesiology</td>
<td>Pamela Powell, Math</td>
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<tr>
<td>Brett Westbrook, Advisor</td>
<td>Jill Marshall, STEM Education</td>
<td>Denise Ekberg, Biochemistry</td>
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<tr>
<td>Annette Hairston, Advisor</td>
<td>Tony Petrosino, STEM Education</td>
<td>Daniel FitzPatrick, Math</td>
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<td>Gary Wene, Executive Asst.</td>
<td>Catherine Riegle-Crumb, STEM Education</td>
<td>Lynn Kirby, Geology</td>
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<tr>
<td>Kate Waldman, Admin Asst.</td>
<td>Flavio Azevedo, STEM Education</td>
<td>Kelli Allen, Biology</td>
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<tr>
<td>Adela Galarza, Admin Asst.</td>
<td>Victor Sampson, STEM Education</td>
<td>Shelly Rodriguez, Biology</td>
</tr>
<tr>
<td>Brenda Baxendale, Admin Asst.</td>
<td>Sepehr Vakil, STEM Education</td>
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<tr>
<td>Michelle Lowry, IT Support</td>
<td>Eric Knuth, STEM Education</td>
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<tr>
<td>Amy Chavez, Accounting</td>
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<td>Maria Allen, Development</td>
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**CNS Faculty:** Ruth Buskirk, Sahotra Sarkar, Dan Bolnick, Stan Roux, Dick Richardson, *Biology*;  
Jay Banner, *Geology*; Pawan Kumar, *Astronomy*, Mark Daniels, *Mathematics*

**CoLA Faculty:** Bruce Hunt, Van Herd, Al Martinez, Megan Raby, *History*
Mentor Teachers

• Mentor teachers are full-time K-12 classroom teachers who host UTeach students for field experiences.

• Mentor teachers are carefully selected, trained, and paid a stipend for services.

• UTeach students receive direction, written feedback, and support from mentor teachers.
3. Long-Term Institutional and Community Support

- University provides space and instructional budget

- Development a priority - dedicated task force raises funds for endowment

- Student support elements require gift funds
4. Compact and Flexible Degree Plans

- **Major Degree + Teaching Option 120–126 credit hours**
  - **Major Courses** include upper-division credit hours that should be close to the same as non-UTeach tracks
  - **Core Curriculum and General Education Courses**
  - **UTeach Courses**
    - 24–27 credit hours

UTeach Institute
4. Compact and Flexible Degree Plans

Step 1: Inquiry Approaches to Teaching

Step 2: Inquiry-Based Lesson Design

Knowing and Learning in Mathematics and Science

Classroom Interactions

Project-Based Instruction

Preliminary Portfolio

Apprentice Teaching

Perspectives on Science and Mathematics

Research Methods

Functions and Modeling

Total Course Hours: 24 - 30

Final Portfolio

Certification

1Functions & Modeling is required only of math certifiers.
2Reading in Content Areas is an additional course required of middle grades certifiers.
4. Compact and Flexible Degree Plans

Flexible Program Entry
A variety of program completion pathways permit program entry at all levels.

<table>
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<tr>
<th>Semester</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<tr>
<td>Freshman Path</td>
<td>Step 1</td>
<td>Step 2</td>
<td>Knowing &amp; Learning</td>
<td>Classroom Interactions</td>
<td>Perspectives Functions &amp; Modeling</td>
<td>Research Methods</td>
<td>Project-Based Instruction</td>
<td>Apprentice Teaching</td>
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<td>Sophomore Path</td>
<td>Step 1</td>
<td>Step 2</td>
<td>Knowing &amp; Learning</td>
<td>Classroom Interactions Functions &amp; Modeling</td>
<td>Perspectives Research Methods</td>
<td>Project-Based Instruction</td>
<td>Apprentice Teaching</td>
<td></td>
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<tr>
<td>Junior/Senior Path</td>
<td>Step 1</td>
<td>Step 2</td>
<td>Knowing &amp; Learning</td>
<td>Research Methods Functions &amp; Modeling</td>
<td>Classroom Interactions</td>
<td>Project-Based Instruction</td>
<td>Apprentice Teaching</td>
<td></td>
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<tr>
<td>Postbaccalaureate Path (requires starting in summer)</td>
<td>Step Combo</td>
<td>Knowing &amp; Learning</td>
<td>Functions &amp; Modeling</td>
<td>Classroom Interactions</td>
<td>Project-Based Instruction Research Methods</td>
<td>Perspectives</td>
<td>Apprentice Teaching</td>
<td></td>
</tr>
</tbody>
</table>
5. Active Student Recruitment and Support

Active recruitment of STEM majors to “try out teaching” at no cost as early as freshman year.

- **Active Recruitment.** Targeted communication strategies and recruitment events to all STEM majors
- **Try Out Teaching.** Recruitment courses allow students to try out teaching in a positive and supportive environment with no demand for commitment to continue in the program.
- **Advising.** STEM major and UTeach program advisors actively support careers in teaching and are informed about degree pathways
5. Active Student Recruitment and Support

Ongoing Student Support

• Build Student Community

• Well-equipped student workroom located near UTeach classrooms, master teachers, and administrative office.

• Flexible internship program provides income and relevant work experiences for students.
5. Active Student Recruitment and Support

**Induction Support**

Master teachers provide graduates with on-demand and targeted support during their first 2 years of teaching.

1. Provide **one-on-one individualized support** in the classroom

2. Provide **targeted professional development** sessions (specific to needs of STEM teachers)

3. Develop **leadership**
6. Dedicated Master Teachers

Master teachers are experienced, successful teacher leaders who are employed as full-time clinical faculty (1 MT for every 50 students).

- Teach or co-teach all field-based courses.
- Recruit, nurture, and support UTeach pre-service students throughout the program.
- Share experiences and understanding of real classrooms and how to innovate within them.
- Knowledgeable connections with school district teachers and administrators.
- Multiple duties, including recruitment, managing student internships, and providing induction support services.
7. Rigorous, Research-Based Instruction

• develop deep-level understanding of content
• build strong connections between educational theory and practice.
• emphasize the underlying connections between math and science
• make explicit how research in learning sciences informs how each is taught and learned.

• Special content courses develop students’
  • perspectives on the historical development of math and science
  • provide them with opportunities to experience the processes by which scientists and mathematicians arrive at new knowledge and methods.
• All courses integrate the design and use of authentic assessments, integration of technology tools, and equitable instruction.
7. Rigorous, Research-Based Instruction

**Faculty**

CNS, COLA, and COE Faculty who are actively engaged in research in mathematics and science, the history of math and science, and the teaching and learning of mathematics and science.

- College of Natural Sciences faculty teach discipline-specific courses in science and mathematics

- College of Education faculty teach professional development courses based on current research on learning and knowing mathematics and sciences

- College of Liberal Arts faculty teach professional development courses based on research in the history and philosophy of science and mathematics.
8. Early and Intensive Field Experiences

• Students experience teaching in real classrooms from their very first semester and continuously throughout the program.

• Students receive intensive coaching and feedback on lesson development and teaching.

• Field experiences are tightly articulated with the UTeach curriculum and closely supervised by course instructors, master teachers, and mentor teachers.
8. Early and Intensive Field Experiences

Four field-based courses provide teaching experiences in elementary, middle, and high school settings prior to final Apprentice Teaching semester.
9. Continuous Program Improvement

- UTeach systematically collects and analyzes both student- and program-level data to make informed decisions about program development and improvement.
- Curriculum is regularly reviewed
- Students provide formal, anonymous feedback on the UTeach program and courses.

Annual student satisfaction survey

<table>
<thead>
<tr>
<th>Category</th>
<th>Satisfied</th>
<th>Neutral</th>
<th>Dissatisfied</th>
<th>N/A</th>
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</thead>
<tbody>
<tr>
<td>Program staff support</td>
<td>82.8%</td>
<td>13.3%</td>
<td>2.4%</td>
<td>1.5%</td>
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<tr>
<td>Access to resources and materials needed for teaching</td>
<td>88.0%</td>
<td>9.1%</td>
<td>1.6%</td>
<td>1.3%</td>
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<tr>
<td>Space available for collaborating, practicing lessons, etc.</td>
<td>79.4%</td>
<td>15.2%</td>
<td>3.7%</td>
<td>1.7%</td>
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<tr>
<td>Degree plan flexibility</td>
<td>56.6%</td>
<td>28.5%</td>
<td>10.8%</td>
<td>4.1%</td>
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</tbody>
</table>

Annual student satisfaction survey chart
Universities Implementing UTeach
Nationwide enrollment for academic year 2016–2017 (6,938 students)

ESTABLISHED PROGRAMS (BEYOND THE INITIAL FOUR-YEAR IMPLEMENTATION PHASE)

University of Nevada, Reno • 125
University of California, Berkeley • 221
University of California, Irvine • 305
Northern Arizona University • 198
Boise State University • 154
University of California, Colorado Springs • 121
University of Colorado at Boulder • 212*
University of Colorado, Chattanooga • 50
University of Tennessee, Knoxville • 109
University of Tennessee, Martin • 79

DEVELOPING PROGRAMS (CURRENTLY IN THE FOUR-YEAR IMPLEMENTATION PHASE)

Temple University • 108
Drexel University • 132
University of Massachusetts, Boston • 93
University of Massachusetts, Lowell • 84
University of Maryland, College Park • 145
Towson University • 110
George Washington University • 74
Old Dominion University • 124
West Virginia University • 142
Western Kentucky University • 145
MOREHEAD STATE UNIVERSITY • 40
University of Alabama, Birmingham • 260
Columbus State University • 74
Kennesaw State University • 48
University of West Georgia • 127

University of Arkansas at Fayetteville • 108
University of Arkansas at Little Rock • 38**
University of Central Arkansas • 113
University of Texas at Dallas • 322
University of Texas at Tyler • 71
University of Texas at San Antonio • 30
University of Texas Rio Grande Valley • 485
University of Houston • 305
University of North Texas • 331
University of Texas at Arlington • 201
University of Texas at Austin • 398
Louisiana State University • 106
Louisiana Tech University • 210

Florida State University • 152
University of Florida • 68
Florida Institute of Technology • 72
Florida International University • 350

Updated Spring 2017. *Estimated program enrollment. **Spring number only.
Example: CalTeach Berkeley

- Cohort 1 replication site
- Course Enrollment:
  - 2006: 16
  - 2016-17: 534
- Teaching Credentials
  - 2011-12: 10
  - 2016-17: 25
Lessons Learned: 10-year Perspective

- Course Sequence: Fidelity vs Autonomy
- UTeach Support: Compliance & Guidance
- Partnerships: Establishing vs Focusing
- Leadership: Fluctuation & Stability
- Program Timeline: Design → Implement → Research
Course Sequence: Fidelity vs Autonomy
UTeach Support: Compliance & Guidance
Partnerships: Establishing vs Focusing
Leadership: Fluctuation & Stability
Program Timeline:
Design ➔ Implement ➔ Research
NATIONWIDE ACTIVE ENROLLMENT IN UTEACH PROGRAMS

Year: 2008–2009 | Enrollment: 1708
Year: 2009–2010 | Enrollment: 2837
Year: 2010–2011 | Enrollment: 4071
Year: 2011–2012 | Enrollment: 4438
Year: 2012–2013 | Enrollment: 5264
Year: 2013–2014 | Enrollment: 5589
Year: 2014–2015 | Enrollment: 5708
Year: 2015–2016 | Enrollment: 6280
Year: 2016–2017 | Enrollment: 6938
CUMULATIVE NATIONAL UTEACH GRADUATES

- **Actual Graduates**
  - 2015: 2668
  - 2016: 3272

- **Projected Graduates**
  - 2018: 4561
  - 2020: 6093
  - 2022: 7659
For More Information

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http://www.uteach.utexas.edu

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