

THE UTEACH ELEMENTS OF SUCCESS

The *UTeach Elements of Success* outline aspects and features of the program that contribute to its effectiveness. As a whole, they articulate the operational structures and instructional philosophies that underlie the UTeach model at The University of Texas at Austin. The nine elements listed here are described in more detail below:

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

Underlying the *Elements of Success* is the commitment of UTeach program developers to reform STEM education by reforming STEM teacher preparation. Their enthusiasm is embraced by the UTeach Institute, the organization charged with supporting implementation of UTeach programs at universities across the United States and leading efforts toward continuous improvement of the UTeach model.

The *Elements of Success* can assist universities in making informed decisions about whether UTeach is a good fit with their own priorities, needs, and local characteristics, and they provide evaluation criteria for implementing UTeach programs.

1. Distinctive Program Identity

UTeach has an established identity as a prestigious secondary STEM teacher preparation program that attracts high-caliber students, experienced and successful master teachers, and tenure-track faculty who are interested in reforming STEM education.

- UTeach is an academic program that functions like a department, employing its own co-directors, program support staff, student advisors, master teachers, and tenure-track faculty.
- UTeach is name-branded and actively promoted through marketing materials, press releases, special announcements, and ceremonies that honor students and faculty.
- UTeach is the only undergraduate program at the university that recommends STEM majors for teaching certification.
- A UTeach website provides a comprehensive program description and ready access to course offerings, program news and reports, and other items of significance.
- A UTeach student organization fosters camaraderie among participants,

establishes a presence on campus, and promotes the program to students and within the university community.

- UTeach students are honored for choosing to become teachers through special ceremonies; opportunities to meet with university administrators, program co-directors, and other supporters; and press coverage.

2. Cross-College and School District Collaboration

UTeach is a formally coordinated effort of the equivalents of the College of Education, the College of Liberal Arts, and the college(s) responsible for administering STEM degrees.

- UTeach co-directors—one representing the STEM college(s) and one representing the College of Education or its equivalent—collaborate to ensure effective program operations and a high-quality teacher preparation experience for students.
- A cross-college steering committee that includes representatives from program faculty and staff meets regularly to develop program policies, monitor curriculum and instructional effectiveness, and manage student affairs and program operations.
- Master teachers and tenure-track faculty from all participating colleges are actively involved in the development and ongoing implementation of the UTeach program to ensure effective course articulation, explicit connections

between mathematics and science, and an appropriate balance of STEM content and pedagogical instruction.

- Administrators, content specialists, and mentor teachers from one or more school districts work collaboratively with UTeach faculty to ensure relevant, high-quality field experiences, feedback, and mentoring throughout the students' UTeach program of study.

3. Long-Term Institutional and Community Support

UTeach is a long-term institutional and community priority that is sustained through ongoing financial support from university and college administrators, as well as a broader range of stakeholders concerned with STEM education reform. UTeach is afforded a level of stability similar to other university departments and is not an outreach effort.

- The university provides a recurring instructional budget, as well as ongoing in-kind support, such as appropriate office space, well-equipped classrooms and laboratories, dedicated student advisors, and an administrative office staff to provide professional services such as purchasing and managing materials, scheduling classes, and processing payments for mentor teachers and student internships.
- UTeach co-directors proactively advocate for programmatic needs and ensure that university leadership is kept informed of program progress and growth.

- Program elements that cannot be paid for by university instructional funds are supported by gifts from individuals, corporations, foundations, and other public and private sources.
- A dedicated task force made up of college development officers, business leaders, and UTeach faculty and staff works to promote the UTeach program and raise funds toward a long-term endowment goal.
- Instructors and staff apply for and administer competitive state and national grants and other awards to provide additional financial support to the program.

4. Compact and Flexible Degree Plans

UTeach offers four-year degree plans that fully integrate students' STEM content major requirements and UTeach program requirements and allow students to obtain secondary STEM teaching certification while earning degrees in science, computer science, engineering, or mathematics.

- UTeach recognizes that students with limited economic means may not be able to add undergraduate semesters to earn a teaching certification. We also explicitly understand the importance of diversifying the current secondary STEM teaching force. As a result, UTeach degree plans allow students to earn both a degree in their major and teaching certification in the same amount of time required by equivalent undergraduate STEM degrees, usually

between 120 and 126 semester credit hours, without the requirement and cost of additional undergraduate semesters.

- UTeach program degrees are equivalent in rigor to other undergraduate STEM degrees, in addition to being fully coordinated with state and national standards for teacher preparation in these disciplines.
- UTeach degree plans include a limited professional development sequence of specially designed courses in mathematics and science education as well as domain-specific mathematics and science courses that fulfill multiple university requirements.
- UTeach provides various pathways for completing required coursework such that program enrollment is open to students at any point in their undergraduate careers, allowing upperclassmen and post-baccalaureate candidates to complete the program in as few as three academic semesters under certain circumstances.

5. Active Student Recruitment and Support

UTeach actively recruits to attract the greatest possible number of STEM majors and provides significant resources and encouragement to maximize program and career retention.

- UTeach employs a variety of targeted communication strategies and

recruitment events to ensure that all STEM majors, particularly incoming freshmen, are invited to participate in the program and aware of its benefits.

- The first two, one-hour field-based courses allow students to try out teaching in a positive and supportive environment with no demand for commitment to continue in the program. Students are offered a financial incentive, such as a tuition rebate, for completing each of these courses.
- STEM major and UTeach program advisors actively support careers in teaching and are well informed about the wide variety of degree plans leading to certification, ensuring that UTeach pre-service teachers successfully meet all requirements for graduation.
- Students are provided a well-equipped workroom with appropriate meeting space, convenient to UTeach classrooms and master teacher and administrative offices, to build community, encourage collaboration, and develop peer support.
- Students have opportunities, facilitated and paid for by the program, to earn income and gain relevant work experience through flexible internship placements at nonprofit STEM or education-related organizations.
- UTeach graduates who enter the teaching profession receive two years of intensive, individualized induction support, including classroom visits, regularly scheduled professional development opportunities, online

mentoring, and access to a lending library of materials.

6. Dedicated Master Teachers

UTeach master teachers—non-tenured clinical faculty with exemplary secondary teaching experience—are exclusively dedicated to student support and program success.

- Master teachers are widely recognized for their educational leadership and secondary mathematics, science, or computer science teaching experience; have earned at least a master's degree; and demonstrate their skill and passion for working with students and novice teachers.
- Master teachers are appointed as non-tenured clinical faculty and are paid from the university instructional budget, hired at a ratio of approximately one per 50 students in a mature program.
- Master teachers co-teach or formally support field-based courses, observing and providing written and oral feedback to evaluate and help students improve their skills throughout the program.
- Master teachers manage field experiences, working with local school district teachers and administrators to ensure appropriate field placements and productive teaching experiences for UTeach students.

- Master teachers maintain an “open door” policy, making themselves available to students on demand (within reason).
- Master teachers are active in program recruitment, manage student internships, and participate in a variety of other student support activities, including tracking students and identifying and following up with any students in danger of not completing the program.
- Master teachers are knowledgeable about what new teachers encounter and provide ongoing and just in time career support for UTeach graduates, particularly during their first two years of induction into the profession.

7. Rigorous, Research-Based Instruction

UTeach courses are designed to develop deep understanding of content of particular importance to future secondary STEM teachers and build strong connections between mathematics and science and between educational theory and practice.

- Rigorous learning outcomes are aligned with national, state, and program standards. Evidence of student proficiency is measured throughout the program using standardized

assessments, including a final portfolio of student work and a field teaching evaluation. Students are required to demonstrate competency across domains ranging from STEM content knowledge to equitable instruction and professional responsibility in order to be recommended for certification.

- UTeach faculty actively involved in STEM research teach content courses such as Functions and Modeling and Research Methods that address topics of particular importance for future STEM teachers, including the processes by which scientists and mathematicians arrive at new knowledge and methods.
- UTeach science and mathematics education faculty teach STEM pedagogy courses and are active in research related to STEM teaching and learning, including how students learn mathematics and science, how to assess what students know, and how to incorporate learning technologies to enhance student learning.
- UTeach faculty actively involved in research on the history or philosophy of science or mathematics teach Perspectives on Science and Mathematics, a content course that develops students’ conceptions about the historical and philosophical development of STEM disciplines.
- Pedagogical instruction throughout the program is discipline specific, focusing on research-based best practices in STEM teaching and learning and the connections between mathematics and science and among the sciences.

- Course instructors—both master teachers and tenure-track faculty—purposefully model effective STEM instruction as students learn to employ research-based pedagogical methods and strategies ranging from inquiry to direct instruction, connecting theory to practice throughout the program.
- Courses emphasize the underlying interconnections between mathematics and science and among the sciences, while making explicit what research in the learning sciences implies about the similarities and differences in how each is taught and learned. Science, mathematics, and computer science majors take UTeach courses together and collaborate whenever possible.
- All UTeach courses integrate research-based themes important to STEM education, including research on and strategies to ensure equitable instruction, how to create and analyze authentic assessments, and pedagogically effective uses of a wide variety of technological tools.
- course instructors to promote full integration of critical knowledge and skills.
- Students develop their own lesson plans, using research-based instructional materials and strategies, with intensive coaching and feedback from both master teachers and tenure-track faculty who are experts in STEM content and pedagogy, in order to ensure UTeach expectations for accuracy and inquiry-based practice are met.
- Students experience multiple STEM teaching opportunities in high-need and diverse elementary, middle, and high school settings to gain an understanding of current K-12 public school environments and student populations.
- Beginning in their first semester and throughout the program, students' time in classrooms is carefully structured, from focused observations of authentic teaching to clinical interviews of students regarding problem-solving strategies to their own experiences teaching, receiving formative feedback, and revising and re-teaching lessons.

8. Early and Intensive Field Experiences

In order to promote confidence and accelerate professional development, UTeach students begin a carefully scaffolded sequence of intensive teaching opportunities in their first semester of the program and continue these field experiences throughout.

- Field experiences are domain specific, tightly articulated with the UTeach curriculum, and closely supervised by
- Mentor teachers—host K-12 teachers who receive stipends for their collaboration—create supportive classroom environments, review lesson plans, and provide oral and written feedback to UTeach students after observing them teach.

9. Continuous Program Improvement

UTeach systematically collects and analyzes both student- and program-level data to make informed decisions about program development and improvement.

- UTeach systematically gathers and reports data on the characteristics of its students and graduates, including numbers of students, grade point average distributions, demographic information, graduation rates, and retention rates in teaching.
- UTeach program co-directors, master teachers, tenure-track faculty, and administrative staff regularly review data on program indicators, reflect on successes and challenges, plan for upcoming semesters, and continue to refine program components.
- The UTeach curriculum is regularly reviewed by the steering committee and instructional teams of faculty and refined to ensure course alignment, minimize redundancies, and update content in accordance with current research on best practices and state and national guidelines.
- Students provide formal, anonymous feedback on the UTeach program and courses through a variety of surveys and are given the opportunity to voice opinions in the presence of program decision-makers at regularly scheduled events and activities.
- UTeach program co-directors, master teachers, tenure-track faculty, and administrative staff interact regularly with colleagues from universities replicating UTeach and other institutions to share information on program development, management, and general concerns related to STEM teacher preparation and support.