Texas State University Capability Statement

Institution: **Texas State University, LBJ Institute for STEM Education and Research**

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OVERVIEW

Texas State University is home to an increasingly diverse campus community where ethnic minorities make up 57% of the student body. Texas State has achieved federal designation as a Hispanic-Serving Institution (HSI) by the U.S. Department of Education and serves a student population which is 39% Hispanic. The College of Education reflects the ethnic diversity of the Texas community – students enrolled in the College self-identify as Asian (2%), Black (12%), Hispanic/Latinx (40%), and White/non-Hispanic (43%).

College of Education

Texas State University's College of Education (COE) is a premier professional school, dedicated to enhancing human potential for all through excellent teaching, cutting-edge research, and community engagement. The College continues the foundational and inspirational work that the University began in 1899 of preparing exceptional teachers for the schools and communities of Texas, while also preparing candidates for a wide range of professional roles in PK-12 schools, higher education, adult learning, and health and wellness fields. COE offers undergraduate, master's, and doctoral programs through its three departments, two college-level research centers including the LBJ Institute for STEM Education and Research, and educator preparation office. These programs are supported by over 170 full-time faculty and 45 full-time staff. The College offers four doctoral degrees: Ph.D. in Adult, Professional, and Community Education; Ph.D. in School Improvement; and one of the few Ed.D. degrees in the nation in Developmental Education, which also boasts the first Ph.D. in the same area of study. The college is addressing the critical shortage of special education teachers across the U.S. through participation as one of only ten universities selected nationally for membership in The American Association of Colleges for Teacher Education's Shortage of Special Education Teachers Networked Improvement Community. The college has also become a leader in the preparation of Spanish-English bilingual teachers and bilingual school psychologists; in cardiovascular, neuromuscular and applied physiology research; in autism and professional counseling services; in culturally responsive community engagement; and much more.

LBJ Institute for STEM Education and Research

The mission of the LBJ Institute for STEM Education and Research is to transform Science, Technology, Engineering and Mathematics (STEM) education and workforce development. It aims to increase the participation and success of diverse communities of educators, researchers, and students by fostering collaborative communities between internal and external stakeholders and partners; conducting rigorous research through an equity lens; providing certified, evidence based professional development; and advancing culturally responsive STEM teaching and learning. The LBJ Institute engages in scholarly research grounded in the scholarship of teaching and learning (SoTL) with corporate, federal, and academic partners on a national and international level to foster an environment for collaboration and teamwork to meet the growing needs of the STEM community and future workforce. The LBJ Institute employs SoTL as systematic inquiry into student learning which is applied to and advances the practice of teaching and development in specific STEM disciplines for the purpose of closing the underrepresentation gaps in STEM. Funded action research and programming have included summer pre-engineering camps for children and youth, community building and professional development experiences for higher education STEM faculty, innovative STEM education curricula development and instructional strategies for pre- and in-service teachers, studies on motivation and identity development for educators and learners in the STEM fields, and professional learning communities that include fellowships, immersion institutes, vertical mentoring and talent development for underrepresented faculty, graduate and undergraduates students.

RESEARCH AND DEVELOPMENT CAPABILITIES

The LBJ Institute recognizes and values diversity, equity, and inclusion (DEI). All research activities, interventions, practices and frameworks are implemented with a DEI integrated approach to promote development and increased representation of groups historically underrepresented in STEM.

Research Approach: The LBJ Institute uniquely positions STEM steering committees that foster inter-institutional cooperation to facilitate participatory research and educational training programs and serves as a networking resource for the establishment of interdisciplinary research teams to contribute to STEM fields of study. Participating principal investigators across disciplines lead research initiatives that explore interventions to positively and significantly impact student recruitment and retention as well as curriculum and pedagogy.

Culturally Responsive Pedagogical Approach: The LBJ Institute trains educators at all levels to use culturally relevant and responsive teaching as an integrated component of their classrooms. This includes training and development through intensive summer programing for students, pre-service, and in-service educators, curriculum development, mentorship, and innovative outreach activities for communities. Efforts are focused on areas which have the highest need (low socioeconomic status) and which will reach larger percentages of students of color who have been historically underserved in STEM education.

Professional Learning Communities: The LBJ Institute serves as a coordination hub for leadership development for faculty, staff, and students from underrepresented groups in STEM. The LBJ Institute has sponsored a collaborative advisory council of stakeholders for organizations that provided leadership development for researchers and innovators in STEM.

Talent Development: The LBJ Institute has integrated organizational human resources processes designed to attract, develop, motivate, and retain productive, engaged students, faculty, and staff. This capability facilitates a high-performance, sustainable organization that meets its strategic and operational goals and objectives while leveraging human capital and strengthening the STEM research pipeline.

Mentorship: The LBJ Institute actively researches and provides programs to support the effective and ongoing mentoring of educators, faculty, staff, and students in STEM. Providing critical knowledge and a vertical mentoring framework to enhance mentorship skills for all levels, the LBJ Institute fosters an understanding of mentorship through critical elements, assisting those who are beginning their careers by building connections and laying the foundation for innovative professional practice—specifically for groups who have been historically underrepresented (i.e. women, women of color, people of color). Through this model, the LBJ Institute builds institutional capacity by training faculty, staff, and students and creating opportunities for professional connections.

FACILITIES

- **LBJ Institute for STEM Education and Research** is center for innovation in STEM education and engagement whose mission is to research and develop model programs that engage students, K-12 educators, and university faculty in crucial STEM areas of inquiry, active learning, project-based and problem-based learning, integrated technology and integrated subjects.
- **LBJ Institute Thinkshop** is a makerspace facility offering a collaborative space focused on student centered inquiry using technology in a hands-on environment with over 50 pieces of equipment used in 3-D printing, laser cutting/etching, book making, robotics, and prototype design.

PARTNERSHIPS

The LBJ Institute utilizes strong relationships with internal stakeholders at Texas State University to maximize institutional human capital, expertise, and resources. The LBJ Institute for STEM Education and Research skillfully leverages partnerships to implement research initiatives for STEM engagement and educator professional development opportunities for learners of all ages and historically underrepresented groups.

- The LBJ Institute has developed the Emerging Stars Network consisting of 117 MSIs and six community and regional STEM entities that provide STEM opportunities and resources to K-12 students. Each member institution has a faculty representative that has accompanied students to a week-long on-site STEM professional development institute. Network members also share NASA content and resources in local professional development offerings and serve as liaisons between the LBJ Institute and their local communities to disseminate information about STEM opportunities and resources.
- The LBJ Institute has developed strong relationships with NASA Centers and Facilities including: Ames Research Center, Armstrong Flight Research Center, Glenn Research Center, Goddard Space Flight Center, Jet Propulsion Laboratory Johnson Space Center, Kennedy Space Center, Langley Research Center, Marshall Space Flight Center, Stennis Space Center.
- Additional past partners include: US Space and Rocket Center, National Institute of Aerospace, Scobee Education Center, Exploratorium, Virginia Air and Space Center, Space Center Houston, Nebraska Extension/4-H Virtual Science Project, Great Lakes Science Center

PAST PERFORMANCE

Since its founding in 2012, its researchers have been awarded more than $28 million in research funding from agencies such as the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), the United States Department of Education, Amazon, and the National Center for Women and Information Technology. Notable federal funding agencies, with sample research projects, include: **National Aeronautics and Space Administration (NASA)** (NASA STEM Engagement and Educator Professional Development Collaborative, $23,644,375.28;) (MUREP Educator Institute, $3,000,000); **National Science Foundation** (NSF Rising Stars, $1,500,000 – all included components of digital, web-based, and/or face-to-face learning and engagement.