

CENTER FOR SCIENCE LITERACY

Mission

It is the mission of the Center for Science Literacy (CSL) to benefit society by improving the education in science and mathematics pre-K through graduate school in Oklahoma and across the nation.

Vision

The Center for Science Literacy will serve as a national model for educational reform in science and math throughout the K-20 educational continuum.

To achieve this the Center for Science Literacy will:

- Be student-centered, scholar-driven, community-focused, nationally aware, and performance-based;
- Be a leader in developing life long learners, from pre-school through retirement;
- Understand Oklahoma's changing educational needs and capitalize on new opportunities through engagement with constituencies at the local, state, and national levels; and
- Be recognized for excellence at the national and international level and seen as vital to the future of Oklahoma.

Core Values

Excellence – We seek excellence in all our endeavors, and we are committed to continuous improvement.

Integrity – We are committed to the principles of truth and honesty, and we will be equitable, ethical, and professional.

Intellectual Freedom – We believe in ethical and scholarly questioning in an environment that respects the rights of all.

Service – We believe that serving others is a noble and worthy endeavor.

Opportunity - We believe that every child has the right to an education that will provide him/her with the opportunity secure a productive place in society.

Diversity – We respect others and value diversity of opinion, freedom of expression, and other ethnic and cultural backgrounds.

Stewardship of Resources – We are dedicated to the effective and efficient use of resources. We accept the responsibility of the public’s trust and are accountable for our actions. We are also committed to leveraging those resources provided by the state with additional federal and private resources.

Goals, Critical Success Factors, Objectives, and Strategies

Goal 1: Provide nationally recognized academic programs in science for all elementary and secondary education majors.

Critical Success Factors:

- Close cooperation between the College of Education and the CSL continues.
- Sufficient number of sections of inquiry-based physics, chemistry, biology, and earth sciences offered to accommodate all education majors.
- 90% of all education majors participate in inquiry-based science courses.
- 100% of graduating students pass the certification tests or sub-tests in science.
- 90% placement of all graduating seniors who have participated in inquiry-science courses.
- Graduates receive disproportionate recognition of teaching excellence at the local (e.g. teacher of the year), state (e.g. state teacher of the year), and national (e.g. National Board Certification) levels.
- Number of Presidential Awards for Excellence in Math and Science Teaching.

Objectives:

Objective 1.1: Increase the number of students that identify OSU as a destination for the education of teachers of science.

Strategies:

- Create summer institutes in inquiry-science for high school students who are potential teachers.
- Expose students to inquiry-based science classes during on-campus visits.
- Create a newsletter for high-school counselors.
- Develop a Principals' Institute to educate administrators about modern approaches to teaching.

Objective 1.2: Achieve state, regional and national recognition for graduating highly qualified teachers of science.

Strategies:

- Survey and publicize results on certification tests, awards received, and student (K-12) successes.
- Continue to bring to campus nationally recognized educators to observe and participate in CSL programs.

- Continue working with the Oklahoma Commission for teacher Preparation (OCTP), the Oklahoma State Regents for Higher Education (OSRHE), the Oklahoma State Department of Education (OSDE), and the Oklahoma Education Association.
- Continue to work with the National Science Resources Center. (The NSRC is an office of the National Academies and the Smithsonian Institution), National Fund for the Improvement of Education (NFIE), and the National Education Association.
- Speak regionally, nationally, and internationally about the CSL programs.
- Principals' Institutes.

Goal 2: Provide world-class graduate programs for K-8 classroom teachers

Critical Success Factors:

- 150 teachers per year taking CSL-offered graduate-level science courses.
- All elementary teachers who take the CSL graduate courses and who sit for the middle-school science certification will pass.
- Graduates of the MS in Natural and Applied Sciences will increase to 15 per year.

Objectives:

Objective 2.1: Provide graduate short courses in physics, chemistry, biology and earth sciences.

Strategies:

- Develop and deliver two-week short courses that focus on the content background necessary to thoroughly understand and effectively deliver the material represented in the National Standards for Middle School Science.
- Train additional faculty and teachers, locally and nationally, to deliver the courses.

Objective 2.2: Attract teachers from Oklahoma and throughout the world to the short courses.

Strategies:

- Work with elementary teachers who attend CSL Professional Development Institutes (PDIs).
- Expand contacts with Missouri teachers who have participated in CSL PDI training.
- Work with the NSRC to establish OSU as the national center for middle school professional development in content and module training.
- Expand established ties with China, Thailand, and Kazakhstan.

Goal 3: Conduct world-class research that advances the knowledge of how children should be taught.

Critical Success Factors:

- \$1M per year in extramural funding to conduct research.
- Two-to-four papers per year published in internationally recognized journals
- Two-to-four invited talks per year at national or international venues.
- Regular visits from national and international experts to observe CSL programs.

Objectives:

Objective 3.1: Identify those factors that lead to students' success in math and science, K-20.

Strategies:

- Begin a longitudinal study of the science literacy of OSU education majors who take inquiry-based courses compared with those that take other science courses.
- Begin a longitudinal study of the science literacy of OSU education majors who take inquiry-based courses compared with science and engineering students who take other science courses.
- Begin a longitudinal study of attitude and performance of classroom teachers who participate in CSL professional development programs.
- Begin a longitudinal study of the academic performance of students who are taught by teachers who have participated in CSL professional development programs.
- Begin a longitudinal study of effective change through the study of the relationship of principals' characteristics to student academic achievement.

Goal 4: Provide Oklahoma children the finest educational system, K-12, in the country.

Critical Success Factors:

- All teachers are schooled in inquiry pedagogy and use nationally validated materials.
- Student retention to graduation is improved by 10%.
- Student success, K-11, on standardized national tests is in the upper quartile.
- Student performance on the ACT is above the national norm.
- Students in locales of high need achieve at a level equal to the state average.
- Matriculation of Oklahoma's students into college is 75%.

Objectives:

Objective 4.1: Provide professional development in the routine use of quality science materials and inquiry pedagogy to all Oklahoma teachers, K-8.

Strategies:

- Work with the OCTP to increase funding for basic science and math professional development to \$3M per year.
- Obtain from federal sources \$1M per year.

Objective 4.2: Target high-need areas in the state for additional intensive intervention.

Strategies:

- Expand current work in Tulsa and include Oklahoma City and targeted rural districts.
- Obtain additional funding from Toyota USA Foundation.
- Apply for Targeted Math and Science Partnership funds and US Department of Education Teacher Enhancement funds.

Objective 4.3: Provide professional development in cross-curricular integration of science, math, and language arts to all Oklahoma teachers, K-8.

Strategies:

- Work with the OCTP to obtain \$500K per year for Cross-Curricular Professional development Institutes. .

Objective 4.4: Provide professional development in Hypothesis Based Learning to all grade 9-12 teachers.

Strategies:

- Work with the OCTP to fund the HBLPD once the current Arthur Vining Davis Foundation grant has run out.

Objective 4.5: Educate principals in the need for using nationally validated materials in the classroom, modern teaching approaches, and cross curricular integration.

Strategies:

- Work with private foundations to fund the development of a Principals' Professional Development Institute.
- Fund the continuation with state, private, and registration dollars.

Goal 5: Achieve national prominence as a model for science and math educational reform.

Critical Success Factors:

- Other states routinely send teachers and administrators to campus to participate in CSL programs
- Faculty affiliated with CSL programs are routinely asked to make national presentations.
- Faculty affiliated with CSL programs are routinely singled out for national awards.
- Teachers routinely receive regional and national awards.
- CSL programs are regularly referred to in trade journals

Objectives:

Objective 5.1: Obtain expanded and improved facilities.

Strategies:

- Seek private funding
- Become a congressional priority

Objective 5.2: Enhance national and international visibility

Strategies:

- Work with national organizations such as NSRC and the NEA
- Expand working relationships with the governments of China, Kazakhstan, and Thailand. Expand efforts to other countries.