

ORU MASST – Math and Science Scholarships for Teaching
SUMMARY OF THE PROPOSAL

Description of Program

Broader Impact: President Obama's Council of Advisors on Science and Technology developed plans for the preparation of 100,000 excellent teachers in STEM content areas over the next decade (PCAST, p. 12). ORU desires to directly participate in this plan by increasing the number of highly qualified math and science teachers who graduate and enter the workforce. Recruitment of underrepresented populations will be emphasized thereby broadening participation of underrepresented minorities, women, and students with financial need or physical disability within mathematics and science education and will include a partnering collaboration with Oklahoma's largest community college. By providing opportunities to interact with students in high-need districts early in their coursework through practicums and internships, targeting placements in two partnering public school districts, MASST graduates will impact their students in a positive way and benefit society in a broader way through engaging with the community. Having highly skilled teachers of math or science enter the workforce, who are also prepared for the practice of teaching, will directly improve science and math instruction to U.S. students. Thus, the MASST program will have a significant multiplier effect as these teachers work in high-need districts and thereby prepare and motivate students to raise their educational aspirations, including the college-level study of mathematics and science. Dissemination of program results, especially those pertaining to how teacher preparation relates to teacher quality, will occur via presentations at state and national conferences, publications in professional journals, and the web. Project assessment will measure the effectiveness of the program specifically targeting incentives in recruiting, preparing and retaining secondary STEM teachers, and the participants' confidence during their preparation and their first years in the classroom. For the 2012-2013 school year, the U.S. Department of Education identified statewide shortages of Mathematics and Science Teachers in Oklahoma. Unfortunately, this problem is not new, with shortages in at least one of these disciplines recurring annually for the past two decades (U.S. Department of Education, 2012). Key hurdles in the state include low per-pupil spending--Oklahoma is 46th nationally--and low teacher pay--the state is 42nd compared to national averages (Archer, 2011).

It is clear that this lack of qualified teachers is having a negative long-term impact on the state's educational outcomes. On the National Assessment for Educational Progress, a standardized subject-area test, Oklahoma 8th graders achieved an average score of 279 (indicating a basic level of knowledge), 5 points below the national average (NAEP, 2011). Results for low-income students, defined by participation in the free-lunch program, were even more alarming, with a 20-point spread between the average non-participant score, 289, and the average participant score, 270. Only 24 percent of eighth-graders tested in Oklahoma scored at the "proficient" or "advanced" levels, compared to a national average of 28% (Eger, 2011). Results on the 2011 Mathematics NAEP were similarly unimpressive, with Oklahoma 8th graders scoring 4 points below the national average. Again, there is an alarming 16 point spread between free-lunch participants at 141, and non-participants at 157 (NAEP 2011). Insufficient primary and secondary education has, in turn, had negative consequences on Oklahoma's post-secondary success. In 2009, only 12.6 out of 1,000 Bachelor's degree recipients earned degrees in STEM subjects, placing the state in the fourth quartile nationally (National Science Board, 2012).

The MASST program at ORU will address statewide and national shortages by encouraging current STEM degree seeking students to consider teaching as a career. With funds that will help complete their academic degrees and provide state certification, more students will seriously consider teaching and more will choose to pursue certification. Current faculty observing students' pursuits upon graduation have found that often ORU math and science graduates end up being hired as local high school teachers through alternative certification, but have not received sufficient pedagogical training. Their subject area mastery is notable, however by not completing an ORU degree in Math Education or Science Education their mastery of teaching skills is lacking. Hence, the MASST program will encourage students to continue to pursue their STEM degree and in addition complete the professional education coursework to become certified in math or science. The MASST Program proposes scholarship to 20 Noyce Scholars divided into three cohorts. These scholars can focus their interest in either science or math, with the plan to attract six scholars in the first cohort and seven for the second and third cohorts, for a total of twenty scholars. The rationale for selecting twenty scholars is that about half of the interns can become scholars and the faculty can manage to supervise 6-7 additional scholars in student teaching every year. Of the 337 students currently pursuing a STEM major at ORU, thirteen of them have declared math or science education. Over the past fifteen years, the Math Education program has produced an average of two graduates per year (73% of them female) and the Science Education program has produced one graduate annually (65% of them female). The MASST program would more than double the number of certified teachers graduating annually from ORU. The objectives for the MASST program are:

- 1) To recruit highly qualified STEM undergraduates into math or science teaching
- 2) To prepare these undergraduates to become highly qualified effective teachers through coursework that aligns with nationally recognized NCATE teacher preparation programs
- 3) To support new math and science teachers during their first two years of teaching through mentoring and professional development opportunities
- 4) To track the successful fulfillment of the two-year teaching commitment by the MASST scholars