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TeachWashington NOYCE Teacher Scholarships/ Stipends

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TeachWashington Noyce Teacher Scholarships/Stipends

Western Washington University, Bellingham, Washington

Project Summary

The goal of the *T*each*W*ashington Noyce Program is to contribute to a larger vision to permanently increase the number of secondary mathematics and science teachers prepared at Western Washington University without sacrificing the proven quality of our graduates.

Current Status

Year 1, 2, 3, & 4: 2009-2013

- 55 new Scholarships/Stipends ($10,000 each) were awarded, and seven "second year" scholarship were awarded (total of 62).
- 60 freshmen and sophomore mathematics and science majors were involved in summer internship positions.

Year 5: 2012-2013

- 9 new Scholarships/Stipends were awarded, and one "second year" scholarship was awarded for (total 10).

Future: 2014-2015

We received a one year no-cost extension. We anticipate 10-15 freshman and sophomore mathematics/science majors will be involved in this summer's internship positions.

To date, we have encumbered $620,000 in scholarships/stipends . We have also employed 60 students to work in three local public school summer programs to help middle and high school students complete courses. These districts report they could not offer these summer programs without the support of WWU students.

Project Activities

To build demand for the scholarships, we will focus on three activities:

Prepare and support 55 STEM students over five years to receive summer internships teaching mathematics and science at three local school districts. After completing a summer internship, students will be eligible to apply for Noyce Teacher Scholarships.

Recruit junior and senior STEM undergraduates. On campus, we will initiate aggressive recruitment and clear advising of current STEM majors who have not declared a teaching interest. We will work with local community colleges to recruit graduates pursuing a STEM major, and to identify candidates from under-represented groups.

Recruit STEM professionals who are considering a career change or have been or may be laid off, to consider teaching as a second career. We will foster relationships with area companies' human resources departments to attract professionals who have the interest and ability to become teachers.

Evaluation

Project Strategies and Corresponding Evaluation Questions:

***R**ecruiting STEM individuals for teaching careers:*

- What strategies does the project employ to recruit scholarship recipients with high academic merit in STEM programs and diverse backgrounds?

How effective are the strategies in recruiting individuals with high academic merit in STEM programs and diverse backgrounds?

***P**reparing STEM individuals for teaching careers:*

- How well does the secondary teacher education program prepare scholarship recipients for teaching careers?
- How well do the Summer Internships prepare undergraduate scholarship recipients for teaching careers?

***R**etaining STEM individuals in teaching careers*

- Do scholarship recipients teach in high need schools during the period in which they are fulfilling their service obligation?
- What is the quality of the science instruction provided to K-12 students by Noyce teachers?

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Findings to date

Twenty-one Noyce Summer Interns, worked to improve K-12 students' understanding of mathematics and science in the Bellingham, Mount Baker and Mount Vernon school districts during the summer of 2013. Sixteen interns completed the pre-survey in June 2013, prior to their summer internship, and fourteen completed the post-survey in October 2012 following their internship. Nine interns completed both a pre-survey and a post-survey.

On the post-survey, six out of the fourteen interns stated that, as a result of their work with middle and high school students this summer, they had changed their thinking about what is needed to help students learn math and science. Interns who expressed that their thinking had changed mostly wrote about the need to employ diverse instructional strategies when working with different students. One intern summed up this sentiment by saying: "*Sometimes sticking to just a textbook study is not enough--students don't all learn math the same way. An example that works for one student will not always work for another. You should be able to adapt based on a student's needs rather than sticking to the method of teaching you are most used to.*"

On the post survey, six interns rated their summer internship as "excellent," seven rated their experience as "good," and one left this question blank. Prior to the summer experience, eleven out of sixteen survey respondents (69%) reported that they were interested in teaching math or science as a career. By the end of the summer, ten out of the fourteen respondents (71%; one respondent left the question blank) were interested in a career in math or science teaching. Interns' reasons for wanting to pursue teaching careers stemmed from their desire to engage students in math and science.

Figure 1 below presents the changes from pre- to post-survey regarding interns' perceived changes in their understanding of key elements of effective science instruction and their understanding of K-12 education in general (n=9). The data show self-reported gains in interns' knowledge of earth science and physics concepts, but a decrease in knowledge of biology concepts. The only change in math concepts was a decrease in knowledge of calculus. Gains are shown in interns' knowledge of: common student misconceptions in science, WA state K-12 math and science standards, current issues in K-12 education, obstacles faced by teachers in K-12 classrooms, and especially obstacles that students face in K-12 classrooms and instructional strategies to help students develop understanding of science and math.

Figure 1: Changes in Noyce Summer Interns' Knowledge and Skills

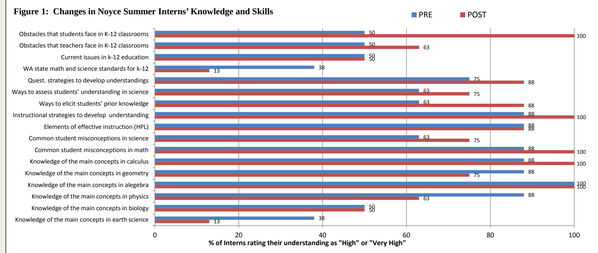

Figure 2 illustrates the changes in Noyce Summer Interns' beliefs about teaching science from the beginning to the end of their summer internship. For some factors (beliefs about the merits of textbooks and memorization of facts), interns had relatively sophisticated beliefs prior to their summer internship; therefore, it was unsurprising that their beliefs did not change. However, more interns by the end of the internship strongly believed that: all students are capable of learning math, students at all grade levels should know and understand math, students learn math best when allowed to explore problems and test ideas, knowledge of math and science helps individuals deal with everyday problems. Additionally, more interns by the end of the internship were strongly confident in their ability to teach scientific concepts to elementary students and to middle/high school students (no change was evident in interns' confidence in their ability to teach math to either group).

Figure 2: Changes in Noyce Summer Interns' Beliefs about Teaching