

Noyce 2014-15

Accomplishments:

Major Activities: Two more scholars were recruited to the project—one from the alternative licensure (OAEL) group and one from the residency program (LAMP)—bringing total participants to 16 (40% of UT³NS project). Sample size for each group is OAEL = 9; LAMP = 7. Data collection and analysis continued as scheduled.

Participants completed the Science Teacher Efficacy Beliefs Instrument (STEBI; for math teachers—MTEBI) and the Teacher Instructional Preference instrument fall 2014. In spring 2014, classroom observations were conducted for those who were teaching (findings from this observation cycle was not reported last year). The Horizon Inside the Classroom observation tool was used to describe and assess teaching practice. In spring 2015, those teaching were observed again but this time we employed the Ohio Continuum for Teacher Development (see Changes section) as it reflects Ohio Teaching Standards and is used by school districts in Ohio to document the development of teaching practice. During spring 2015 the evaluation team also developed math and science teaching assessments wherein participants viewed a video of either a math or science lesson and then answered questions about what they observed. This assessment was administered in July/August 2015 and some findings from that assessment are available (not all have completed it yet). This tool was developed so that a comparison between those who are teaching and those who are not might be made.

Key Outcomes: In general, graduates from the residency program were more successful in gaining employment as teachers. The total OAEL group has 50% employment in high needs schools and 7% in other school districts with an additional 18% teaching as substitutes. The LAMP group has 91% employment—all in high needs districts or schools. Since the last report, two participating scholars have left teaching (one from each group). Follow up to determine reasons will take place this fall and will be reported next year. Of the 9 OEAL in UT³NS Plus, 67% are still teaching while 71% of the LAMP participating group is teaching. A chi square test of homogeneity showed no statistically significant difference in the percent teaching suggesting that the groups are equivalent on this variable.

The math and science efficacy instruments were used to determine whether differences existed between groups with regards to their belief that high quality teaching can improve learning and whether they themselves can deliver this type of instruction. With the exception of one LAMP scholar, all of the participants scored essentially the same on the self-efficacy instrument. In general, they all scored in the top 20% of the maximum score on their belief in the effectiveness of high quality instruction and in the belief they could provide such instruction. Interestingly, the one scholar that scored well below the group mean was also one of the teachers who left the profession at the end of the previous school year.

Nine scholars completed the Inquiry Preference survey (OAEL = 4; LAMP = 5). This instrument provides two scores—one for a preference for inquiry teaching practices and one for non-inquiry. Results of this assessment showed that 50% of the OAEL had a higher preference for inquiry practices over non-inquiry while 80% of the LAMP respondents did so. Future research will compare teaching preferences with actual teaching observation scores to determine whether preference indeed becomes practice.

In fall 2014, eight of the eleven participants teaching were observed and observations were scored using the Horizon instrument. Five of the eight were from the LAMP cohort (some observations were not conducted due to teaching schedules). Scores on the rubric showed the groups to be essentially equivalent although a statistical analysis with such a small group was inappropriate. Instead, a comparison of median scores on the four elements (design, content, implementation, and classroom culture) was examined. Scoring for the Horizon were equivalent between groups on all categories (median score of 3 on a 5 point scale) except for the content category. In content, the alternate license group had a median score of 3 but the residency group's median was 2. However, two of the residency group had a 4 and the other three had a 2 while those in OAEL had a 2, 3, and 4. Because the number of teachers observed was small, conclusions cannot be drawn about the differences. In addition, Horizon recommends looking at the overall ranking rather than individual categories when drawing conclusions. Overall ranking for both groups was a 3; Horizon defines this as "solid beginnings of effective practice." The OEAL group had one extra year of teaching experience prior to the assessment suggesting that the residency program itself added an extra year of practical teaching experience for those in LAMP.

Only five teaching observations were conducted Fall 2014: two from OAEL and three from LAMP. The overall scores on the Continuum for all five observations was a "3" or "proficient." The categories include working with students, content, assessment, instruction, learning environment, and communication. Two of the LAMP group had difficulty making real life connections. On the other hand, the LAMP lesson observed appeared to encourage more student collaboration than the OAEL lessons. However, it must be remembered that the lessons are one element of a unit of instruction so findings are somewhat limited.

To date, eight science teachers completed the project-developed science teaching assessment (4 from each group). Overall scores on the instrument were high with very little observable difference existing between the two groups (OAEL = 2.55; LAMP = 2.47). There were two items that had low scores overall. The first item asked how student justified their answers to a particular challenge. Answers to this question were generally lower because many responses identified either the content or process skills but not both or because they mentioned students used data but did not explain how it was used to justify their answers. The LAMP group gave responses that were less in-depth than those in the OAEL group and one teacher (LAMP) failed to respond to this question. As a result their scores on this question had the highest degree of separation (OAEL = 2.25; LAMP = 1.25).

The second item asked the teachers to describe the science process and/or inquiry skill(s) the students are learning in the video. Answers to this question were generally lower because many OAEL responses identified skills that were not process or inquiry skills (like calculating answers) or did not sufficiently elaborate on answers to gauge high-quality (OAEL = 1.75; LAMP = 2.25)

Impact:

Teacher ed: While findings from this project are still preliminary, there is a suggestion that a residency program that provides the pre-service teacher with a practical, long term placement may provide the same experience a novice teacher gets during the first year. Considering that many new teachers often burn out during their first few years or feel they have little support, a residency program that provides a first year of teaching experience under the guidance of STEM education faculty can contribute to STEM teacher retention and perhaps improve the quality of teaching during the first year on the job.

Changes:

To improve project participation, stipends were increased to \$200. Two additional participants were added. Because some of the Noyce Scholars are not teaching, we created a science and math teaching assessment that asked participants to view a video of a science or math lesson and then answer questions about what they viewed (see attachment for questions and scoring rubric). This assessment allowed us to compare knowledge and understanding of pedagogy between the groups. We also added the use of the Ohio Continuum of Teacher Development for classroom observations which is based on the Ohio Standards for the Teaching Profession and is used throughout the state to document teacher development. A copy of the Continuum and its rubric are attached. These changes enabled us to gather a more detailed description of teaching practice and development.