University of Toledo
UT³ Noyce Plus - Monitoring & Evaluation Project

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Why We Are Doing What We Are Doing

The University of Toledo's UT³ Noyce Scholarship Program was a four year program that prepared 40 professionals with a minimum of a B.S. degree in engineering, mathematics, or the sciences for middle and high school science and math teaching. Two pathways to completion were utilized during the course of the project (see Table 1) .

UT³ Noyce Plus provides an in-depth examination of the process STEM professionals engaged in as they transitioned to teaching. It also provides the opportunity to view the struggles and successes of recent STEM education graduates as they sought employment in a time when teaching positions were competitive, as they retooled through the completion of additional coursework, and as they experienced their first three or more years of full-time teaching. In addition, it compares professionals who have taken two distinctly different paths to reaching their goal of STEM teaching.

Table 1: UT³ Noyce Teacher Preparation Programs

	Ohio Alternative Educator License (OAEL)	License Alternative Master's Program (LAMP)
Years	2009-2012	2013
Participants	27	12
Duration	6 months (4 weeks in summer, fall semester)	2 full semesters (fall/spring)
Coursework	12 semester hours	36 semester hours
Student teaching	Methods course; one year on the job with district mentor	2 semesters (fall/spring) full residency with one teacher
Licensure	Temporary. Full licensure after 2 years classroom teaching under a district mentor and additional 12 hours of graduate coursework	Full licensure upon graduation

Early findings indicated differences in outcomes between the two programs as illustrated in Table 2 below:

Table 2: Outcome Measures at Graduation Between OAEL and LAMP

Measure	OAEL (cohorts 1-3)	LAMP (cohort 4)
Undergraduate GPA	2.50	2.70
STEBI/MTEBI Personal Beliefs	37.48	50.2*
STEBI/MTEBI Outcome Expectancy	30.98	28.4
Haberman Star Teacher		
Quartile 1 (highest)	14%	75%*
Quartile 2	38%	25%
Quartile 3	46%	0%*
Quartile 4	0%	0%
Percent teaching in high needs school/district	50%	91%*
Percent teaching in other than high needs	7%	0%*
Percent substitute teaching	18%	0%*
Percent not teaching at all	25%	9%*

*Indicates a statistically significant difference (STEBI/MTEBI = t test; others = χ2)

What We Have Done

Methods used in the extended evaluation were developed with the goal to better understand the path UT³ Noyce Scholars have followed since graduating from the UT³ Noyce program.

Recruitment
- Thirteen NOYCE Scholars were recruited in 2013-2014.
- One additional participant was added to the 2014-2015 evaluation bringing our total to fourteen (35% response rate).
- Two more participants were added in the 2015 cycle bringing the total to sixteen (40% response rate).
- Of the sixteen participants, nine were in the OAEL program and seven were in the LAMP program.

2013-2014
- Participants completed the Science Teacher Efficacy Beliefs Instrument (STEBI and for Math teachers – MTEBI).
- Participants completed the Science Teacher Instructional Preference Scale (STIPS).
- Observations were conducted using the Horizon Inside the Classroom observation tool. This was used to describe and assess teaching practice.
- One-on-one phone interviews were conducted with both teachers and non-teachers to explore career decisions and teaching experiences.

2014-2015
- Math and science efficacy instruments were again used to determine whether differences existed between the OAEL group and the LAMP group – the Haberman Survey and Learning Styles Survey were implemented.
- Classroom observations were conducted using the Ohio Continuum of Teacher Development to document the development of teaching practice.

2015
- Math and Science Teaching Assessment Surveys were implemented where participants viewed videos of either math or science lessons and then provided an extended analysis about what they observed.

What Challenges We Face

- Recruiting participants proved to be challenging; we increased the teacher's stipend from $100 to $200 to encourage more participation.
- Due to participants being added throughout the course of the extended evaluation, we have a different sample size each year.

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What We Have Learned

Findings suggest that the LAMP residency program provides on-the-job experience that improves teacher self-efficacy that it took the OAEL cohort up to three years to achieve.

Table 3: Outcome Measures of Teaching Between OAEL and LAMP*

	OAEL	LAMP
Percentage of sample teaching	67%	71%
The math and science efficacy instruments	All scored in the top 20% of maximum score	All scored in the top 20% of maximum score
Inquiry Preference survey	n=4 50% prefer inquiry over non-inquiry	n=5 80% prefer inquiry over non-inquiry
Scoring observations using the Horizon instrument	n=3 Median score of 3 out of 5 "Solid beginnings of effective practice."	n=5 Median score of 3 out of 5 "Solid beginnings of effective practice."
Scoring observations using the Ohio Continuum of Teacher Development	n=2 All scored proficient	n=3 All scored proficient
Project developed rubric based on inquiry teaching practices	2.55	2.47

***No statistically significant differences where observed suggesting that after 3 years the OAEL and LAMP groups are equivalent on these measures.**

What We Are Doing Next…

During our final year we will continue to explore teacher identity and quality using the following instruments:

Table 4: Year Four Evaluation Measures

Measure	Variable/Purpose
Teacher Belief Inventory Nottis, Feuerstein, Murray, & Adams, 2000	The degree to which teachers prefer a theoretical or practical orientation toward educational problems.
Teacher Beliefs Interview Lufts & Roehrig, 2007	A semi-structured, 7-item protocol designed to elicit teachers' beliefs about teaching, learning, and students in mathematics and science classes.
Pedagogy of Science Teaching Test (and an adaptation for mathematics) Western Michigan University	Vignettes are presented along with open-ended questions that probe teachers' teaching approaches and pedagogical decisions to be made. Measures degree to which the teacher embraces inquiry.
In depth, project developed interviews	To explore changes over past year, attitudes towards teaching, teacher professional development activities, and plans for the future.

http://acumenresearcheval.com/projects-research/noyce/