



# Strengthening a Community of Teacher Leaders

NebraskaNOYCE in collaboration with NebraskaMATH



UNIVERSITY OF NEBRASKA-LINCOLN  
Robert Noyce Teacher Scholarship Program



“Working with a university is rewarding if for no other reason than knowing that professionals who already have the respect, admiration and support of the public believe in you and what you do and that they value your knowledge, skills and ideas. Partnering with the university as an equal makes me feel like the professional educator that I envision in my career. I do what I do out of the belief that it matters in making life better for my community, state and country. This fellowship has inspired and re-motivated my career by solidifying my belief in myself and the importance of what I do. I wish more teachers could feel valued and appreciated in the ways that I have in the past five years.”

Jason Vitosh  
Noyce Master Teaching Fellow



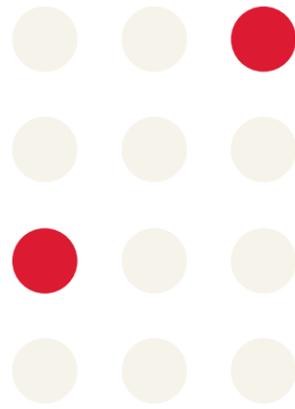
## Strengthening a Community of Teacher Leaders

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# Strengthening Teacher Leaders



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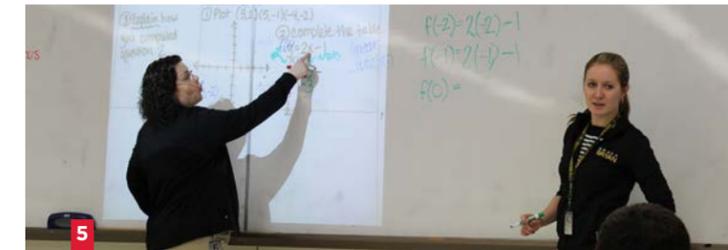
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5

**1** OPS MTF Brent Larson was the cooperating teacher for TF Pat Spieler (right) at Central High.

**2** Alan Holdorf is one of the 13 TFs who was attracted to the NebraskaNOYCE program. He now teaches at a LPS high school.

**3** Tanya Archie (standing right) is one of the 30 MTFs who has instructed graduate courses for teachers at UNL.

**4** MTFs Pat Janike, Katie Soto and Shelby Aaberg discuss readings in Noyce graduate course TEAC 949A.

**5** MTF Katie Garcia of OPS' Bryan High School co-teaches with her TF Lauren Beitel.

**S**trengthening the number of mathematics teachers and the quality of mathematics teaching represent critical steps toward improving K-12 mathematics achievement. NebraskaNOYCE, a \$3 million National Science Foundation (NSF) Robert Noyce Teacher Scholarship Program grant awarded to the University of Nebraska-Lincoln (UNL) in 2010, builds on a robust statewide partnership and two past NSF Math Science Partnerships – the Math in the Middle Institute Partnership (M<sup>2</sup>) and NebraskaMATH – to increase the number of high-quality mathematics teachers in Nebraska's high-need schools.

NebraskaNOYCE, under the overarching brand of NebraskaMATH, has successfully recruited and significantly supported 30 remarkable Robert Noyce NSF Master Teaching Fellows (MTFs) and 13 Teaching

Fellows (TFs), who since have graduated from the Master of Arts teaching (MAmt) degree program at UNL and become teachers in a partner high-need school district (see box on page 5). The Noyce grant program supports these teachers with mentoring, professional development and salary supplements while they fulfill their teaching commitments.

Competitiveness for the United States depends in part on dramatic improvements in the math and science education of its K-12 students, which in turn depends on improving the overall quality, quantity and placement of mathematics teachers. UNL and its school-district partners are responding to these challenges through NebraskaNOYCE and the preceding NebraskaMATH partnerships, all of which are creating a national model for how faculty and K-12 administrators

and mathematics teachers work together to strengthen the teaching and learning of mathematics in schools.

The 30 MTFs were chosen between Spring 2011 and Fall 2013. These outstanding teachers had to: be a math teacher or math coach in a high-need school district; have earned a master's degree; be seeking additional opportunities to take graduate coursework that would strengthen their ability to be a master teacher; demonstrate superb knowledge of mathematics on Praxis II Mathematics Exams; agree to teach in a high-need school district for at least five years; and want to make major contributions to mathematics teaching and learning in their school and district. MTFs received a \$10,000 salary supplement for participating in the 24-credit-hour program and a fellowship to cover the cost of tuition and

fees at UNL for coursework that emphasizes developing leadership skills, teaching diverse learners in high-need schools and motivating students in the classroom.

MTFs were encouraged to pursue National Board Certification to validate their knowledge and ability as a master teacher (see page 18). The MTF program informs the nation as to what can be achieved by a strong university and local school partnership, engaging master teachers as leaders.

During the first year of the NebraskaNOYCE award, the grant's principal investigators (PIs) worked with colleagues in the UNL Department of Teaching, Learning and Teacher Education as they developed the MAmt program, a 14-month master's degree with teaching certification program. During the grant's second and third years, 13 TFs (STEM professionals and college

## NOYCE PARTNER SCHOOL DISTRICTS

In addition to funds received from NSF, UNL and its local school-district partners provided a \$1.5 million match to support the NebraskaNOYCE award. The Omaha Public Schools (OPS), Lincoln Public Schools (LPS) and Grand Island Public Schools (GIPS), the state's three largest high-need districts, were core partners for NebraskaNOYCE. Nebraska's Educational Service Units Coordinating Council also joined as a partner to ensure that high-need rural districts were eligible to be part of NebraskaNOYCE. Over the life of the grant, NebraskaNOYCE selected 30 outstanding teachers from

high-need Nebraska school districts to be NSF Noyce Master Teaching Fellows (MTFs), making the cohort one of the largest groups of MTFs to be selected for a single Noyce award. The group includes 10 from OPS, 11 from LPS, and three from GIPS. In addition, six MTFs teach in smaller, rural high-need districts. Achieving one of the Noyce program's goals, i.e. the retention of master teachers in high-need districts, all 30 of the MTFs are still working in high-need Nebraska school districts, as well as 12 of the TFs, seven of which are in OPS and three in LPS (in the 2015-16 school year).

graduates who wanted to consider becoming a mathematics teacher) finished and became Nebraska teachers. Twelve of the TFs are still teaching in a high-need Nebraska school district.

Research (Ball, Hill, & Bass, 2005; Ball, Thames & Phelps, 2008; CBMS, 2001/2012; Cuoco, 2001; Heid, 2008; NCTM, 2000) concludes that to be successful, mathematics



UNL Noyce co-PI Lorraine Males (third from right) with Noyce Teaching Fellows (from left, Joseph Steele, Collin Holmquist, Lauren Beitel, Jamisen Goodell and Jeremy Jank) at the 2014 Midwest Regional Noyce Connections Conference in Omaha



Master Teaching Fellows (from left) Dan Schaben, Jason Vitosh, Alicia Davis, Shelby Aaberg, Susie Katt, Jerel Welker, Cindy Beaman, Josh Males, Edie Ronhovde, Connie Colton, Jill Luschen, Katie Soto, Tanya Archie, Jill Edgren, Katie Garcia, Phil LaFleur, Sherry West, Pat Janike, Matt Timm, Anne Schmidt, Brent Larson and Delise Andrews at the 2014 Midwest Noyce conference

## STATEWIDE SUPPORT

The NebraskaNOYCE grant and the MTFs and TFs supported by the grant have benefited from a robust statewide partnership led by UNL faculty that is focused on providing content-rich graduate education opportunities for Nebraska mathematics teachers. The partnership began with two NSF-funded Math Science Partnerships: the Math in the Middle Institute Partnership and NebraskaMATH. As part of these grants, UNL established the Nebraska Math and Science Summer Institutes (NMSSI) to institutionalize UNL's commitment to the education of mathematics teachers begun by these two grants. Subsequently, the NebraskaMATH Omaha Public Schools Teacher Leader Academy, which was funded by The Sherwood Foundation® and the Lozier Foundation, as well as several grants from LPS have made it possible to continue the work of the two MSP grants. As a result, during the summers of 2012-2016, UNL has offered an average of 42 graduate courses designed especially for mathematics teachers. As reported elsewhere in this publication, NebraskaNOYCE MTFs and TFs have been a significant part of the instructional teams that teach these courses.

## NOYCE BY THE NUMBERS

- 30** All of the MTFs have been employed as either a lead instructor or supporting instructor for a UNL graduate course for teachers
- TFs have been employed as either a lead instructor or supporting instructor for a UNL graduate course for teachers (see page 24) **4**
- 13 + 1** pursuing doctorates or graduated (see page 21)
- 6** articles published in journals (see page 10) **8** math department heads / liaisons
- 3** MTFs are winners of the prestigious NSF-funded Presidential Award for Excellence in Mathematics and Science Teaching

teachers need a knowledge of mathematics that differs from other mathematics users, such as a deep understanding of the mathematical concepts, procedures and reasoning skills central to the grade levels they will be teaching. This level of deeper mathematical knowledge is beyond what most teachers experience in standard pre-service mathematics courses in the United States (NCTM, 2000, 2014).

While STEM professionals can become teachers without participating in a credentialing process in many states, there is more to good teaching than knowing content deeply (e.g., Ball, Thames, & Phelps, 2008; Grier & Johnston, 2008). Darling-Hammond et al. (2005) studied Teach for America participants, choosing those from elite universities considered the brightest in their fields, and they found student test scores increased significantly only once the teachers completed credential programs. The often lengthy credentialing process and its cost can be a barrier to attracting STEM professionals to return to colleges to pursue certification to teach (e.g., Grier & Johnston,

2008). Before NebraskaNOYCE, UNL's post-baccalaureate program required two years to earn certification and did not lead to a master's degree. The shorter, but intense, MAmt program offers an attractive path to becoming a teacher.

Beyond the problem of certifying enough high-quality secondary mathematics teachers to fill the need for mathematics teachers, there is the additional problem of keeping newly certified teachers in the classroom, especially high-need classrooms. Ingersoll and Perda (2010) show the number of newly certified math teachers is more than double the number of those retiring, but this is only enough to fill 60 percent of the positions available because so many teachers leave for other reasons. National data indicate 40 percent of secondary math teachers certified in a given year leave the classroom within five years, with greater percentages for high-need school districts (Ingersoll, 2000, 2012; Ingersoll, Merrill, & May, 2014; Smith & Ingersoll, 2004).

Moreover, Darling-Hammond (2007) makes the point that high-need school districts often struggle

to attract and retain high-quality mathematics teachers, many of whom are attracted to positions in suburban districts that have more resources to pay higher salaries and provide opportunities to teach in less challenging conditions. High-need districts end up with the least-qualified mathematics teachers teaching the highest-need students. Strong support and content-specific mentoring can help increase the retention rates for new teachers (Gschwend & Moir, 2007; Morgan & Kritsonis, 2008), as can enculturating teachers into communities of practice (Dalgarno & Colgan, 2007; McGinnis, Randy, & Graeber, 2004).

Equipping these new teachers, and the 30 MTFs, to successfully teach mathematics in high-need school districts greatly impacts mathematics within the state. Nearly all of the TFs were placed in the classroom of a MTF for a yearlong field experience. This tightly knit collaboration offered the TFs intensive, sustained field experience in diverse classrooms designed to connect theory and methods to classroom practice under the direct guidance of a MTF. However, to truly impact all students, a special effort is

needed to support mathematics teachers in high-need schools. The Noyce partner districts serve 31 percent of Nebraska's public school students, but 43.4 percent of Nebraska students from families below the poverty line, 78 percent of the African-American students and 46 percent of the Hispanic students. The NebraskaNOYCE partnership is an important effort to strengthen teacher quality where it is needed most.

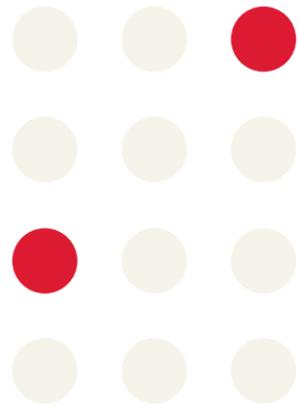
Mentoring and professional development for TFs and MTFs is ongoing. For TFs, the NebraskaNOYCE leadership team focuses on the process of integration into the culture of the TFs' education community, developing and refining their skills as teachers, and helping them become lifelong learners of mathematics and reflective

practitioners with the knowledge and ability to meet the needs of a diverse student population. Each TF joins NebraskaMATH's New Teacher Network, utilizing the resources of that partnership to build a strong, supportive community and continue graduate coursework.

To support the MTFs' continued growth as master teachers with strong leadership skills, each partner district made the commitment to provide each MTF with release time from their normal teaching duties each semester to work with the NebraskaNOYCE co-PIs and key district mathematics leaders. While some MTFs became math coaches for their districts, most MTFs remain in the classroom as they work to give back to their school and district and to the

UNL teacher education program. Care has been taken by UNL's NebraskaNOYCE leadership team to individualize each fellow's opportunities to ensure rich experiences and strengthen this community, but not to detract from the main job of teaching students.

Learn more in this publication about the accomplishments of these fellows and the benefits reaped from strengthening the leadership roles of a Noyce community. These fellows have become leaders not only in Nebraska, but also nationally. This exploration of their leadership roles, speaking engagements, awards, work as instructors for graduate courses for teachers and pursuit of doctoral degrees showcases this remarkable community they have built. ●



# Leading the Way



**1** Delise Andrews, Paula Jakopovic and Matthew Timm became OGAP Fraction Progressions Framework trainers in 2015.

**2** Susie Katt (third from left) was a member of the NCTM Minneapolis Regional Planning Committee.

**3** Shelby Aaberg and Dan Schaben traveled to Washington to the 2014 National Board for Professional Teaching Standards Conference.

**4** TFs Brianna Pinquoch (left) and Sarah Fischbein are summer 2016 consultants at Camp KSC at Kennedy Space Center. The 2016 Midwest Regional Noyce Connections Conference will be held at KSC for scholars and fellows from all of the Midwest Noyce projects.

## NATM presidents present vision as teacher leaders

Three of the Nebraska's Noyce Master Teaching Fellows (MTFs) have served as president of the state's association for mathematics teachers, one before becoming a Noyce fellow, one at the beginning of the Noyce grant and the third at its end.

Jill Edgren of Wood River Rural School served as president of the Nebraska Association of Teachers of Mathematics (NATM) in 2011-12.

"I learned many details and behind the scenes logistics for holding and hosting events," said Edgren, who graduated with her master's degree through Math in the Middle (M<sup>2</sup>). "I was in charge of organizing the annual conference in 2011, and I have presented a breakout session from that year onward. I admire others on the board with their history

and perspective as well as the new ideas that surface regularly as we join together in efforts to support Nebraska teachers."

Edgren said the Noyce program has provided her the opportunity to become a leader within her district and beyond. She is part of the teacher advisory, negotiating and school improvement steering committees for her district, and she has presented technology topics to her co-workers. Edgren also has traveled across the state to observe math classrooms of the other MTFs and presented at three Math Teachers' Circles in Grand Island, Kearney and Superior.

Edgren and Dan Schaben, a MTF in Arapahoe, who was NATM president before Noyce, later encouraged fellow MTF Shelby Aaberg to run for president of NATM. Aaberg currently serves as president for 2015-16. Aaberg is proud to have secured Dan Meyer,

a highly regarded speaker and chief academic officer at Desmos, as the keynote speaker at the 2015 annual conference in Kearney.

2015 was a tremendous year for Aaberg, the math department chair at Scottsbluff High School. By being named the 2015 Nebraska Teacher of the Year and a winner of the Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST), he shook President Barack Obama's hand three times (see page 22).

"Noyce gave me the validation and professional courage to take a risk and apply for Teacher of the Year," Aaberg said.

Throughout 2015, Aaberg was able to spend a week in Phoenix with the other State Teachers of the Year; attend the Midwest Mathematics Meeting of the Minds (M4) Conference in Iowa and participate in a workshop led by Jo Boaler of Stanford University; introduce

Alfie Kohn at the What Really Works Conference at California State University, Northridge; share his experience as a student and educator in rural Nebraska as a featured speaker at the Chief Council of State School Officers Rural Chiefs Meeting in Omaha; travel to Kaiserslautern, Germany, to observe the classroom instruction of the Algebros (<http://www.flippedmath.com>); and present "Making Mistakes in a Good Direction" in Toulouse, France, at the Practical Pedagogies Conference held at the International School of Toulouse.

In 2013, Aaberg earned National Board Certification in early adolescent mathematics, along with six other MTFs that year (see page 18). This achievement, combined with Noyce travel support, allowed Aaberg and Schaben to travel to the 2014 National Board for Professional Teaching Standards

Conference in Washington. They attended talks by U.S. Secretary of Education Arne Duncan, Deborah Ball, Linda Darling-Hammond, Pedro Noguera and Bill Gates, and met Sarah Wessling, Maddie Fennell and a host of other national leaders in education.

## MTFs utilize technology to aid student learning

Since 2010, Schaben, a M<sup>2</sup> graduate, has been creating mathematical videos on YouTube for his students, for all of the classes he teaches. In 2013, Schaben's YouTube channel had anywhere from 100 to 400 views a day on 183 videos, and views have grown steadily. Today, his channel has hit 750,000 views, with a retention rate of 2.5 minutes – translating to 2 million minutes of total viewing.

"I have subscribers from all over the world, just under 1,000,"

said Schaben, who has been teaching in rural communities since 1998.

Schaben said he has been building two "orienting" problems with YouTube, GeoGebraTube, Google Earth, compasses and an aviation map. The first problem, titled "Find My Location," has two videos on YouTube. Schaben also has his own website, <http://searchingformath.com>.

"My favorite thing about teaching is all the new ways we can visualize mathematics with technology – not that technology should drive our instruction, on the contrary," Schaben said, "technology has a power to enhance and connect what we already teach."

Jerel Welker, secondary mathematics coordinator for Lincoln Public Schools, who became a MTF in 2013, frequently uses GeoGebra like Schaben.

## PUBLICATIONS

### Shelby Aaberg and Jason Vitosh:

The legend of the Indian wrapper. *Mathematics Teacher*. (Accepted/to appear in 2016). Co-author: Noyce PI Wendy Smith, UNL

### Darla Berks and Amber Vlasnik:

Working the system. *Mathematics Teacher*, 107(7), 542-545 (2014)

### Connie Colton:

Successfully transitioning to linear equation. *Mathematics Teacher*, 107(6), 452-457 (2014). Co-author: Wendy Smith, UNL

### Alicia Davis and Katie Garcia:

Problem Analysis: Challenging All Learners. *Mathematics Teacher* (2013)

To read the article: <http://www.nctm.org/publications/mathematics-teacher/>

### Paula Jakopovic:

Infrastructure Redesign and Instructional Reform in Mathematics: Formal Structure and the Practice of Teacher Leadership. *Elementary School Journal* (2013)

Co-authors: James Spillane and Megan Hopkins, Northwestern University, and Ruth Heaton, UNL

To read the article: <http://hub.mspnet.org/index.cfm/26083>

**Jerel Welker:** Essential Elements for Building Community: The New Teacher Network. *Mathematics Teacher Retention* (2012)

Co-authors: Wendy Smith, UNL; former LPS educator Sue Graupner; and retired Papillion-La Vista teacher Linda Hayek

To read the article: [http://go.unl.edu/ntn\\_bldgcomm](http://go.unl.edu/ntn_bldgcomm)

Welker said his graduate courses in statistics have been useful when dealing with technology. For the past few years, Welker has been assisting LPS with the assessment module of its new student information system. He provides assessments to students and meaningful views of the results to teachers and administrators.

Welker is also a member of the National Council of Teachers of Mathematics (NCTM) Classroom Resources Committee on building. Working in teams, teachers build an activity with rigor and coherence, integrating multiple lessons into a unit of study. The activity frequently involves a technology component to allow students to engage and explore a specific topic. As teacher teams develop, teach and revise a lesson to share with others, Welker said the teachers often say it was one of the best professional development activities they have experienced.



Danielle Buhrman

The use of technology in the classroom also has been a focus for Danielle Buhrman, a MTF at Grand Island Senior High. A story featuring Buhrman that appeared in the Grand Island Independent in December 2012 was picked up by NCTM and featured in its daily news brief. Buhrman created a website to offer extra assistance to students in preparation for the Advanced Placement Calculus class. The “Math With Buhrman” site includes “notes” Buhrman has created for each math chapter, along with videos and images she creates addressing concepts and material she thinks students might struggle with on their own.

In February 2016, LPS MTF

Sherry West of Lincoln Southeast High School attended the Texas Instruments (T<sup>3</sup>) conference in Orlando, Florida, to look for more ways that technology could enhance instruction, since LPS will be receiving Chromebooks. Teachers came away from T<sup>3</sup> with classroom activities for practicing transformational skills, using programming to grasp reasoning behind solving equations and using TI-inspired software to have students explore and recognize patterns.

West’s Southeast colleague Alan Holdorf, a TF who majored in math and computer science at UNL, has used his Noyce travel funds to attend annual conferences of the Computer Science Teachers Association as well as Advanced Placement.

“Each of these conferences has given me strategies and professional contacts that have greatly helped to shape me as a teacher,” Holdorf said.

## Math coaches dive into OGAP fractions training

When elementary math coaches and MTFs Delise Andrews of LPS and Paula Jakopovic and Matt Timm of OPS were looking for professional development opportunities that focused on fractions, Noyce co-PI/PI Wendy Smith put them in touch with Marge Petit of the Ongoing Assessment Project (OGAP).

Petit, who was a member of the NebraskaMATH National Advisory Board, had come to UNL a few years earlier and done training with graduate students on the multiplicative framework.

In August of 2015, Andrews, Jakopovic and Timm attended a weeklong OGAP training program with Petit in Concord, New Hampshire, to become trainers for the OGAP Fraction

Progressions Framework (read more at [www.ogapmath.com](http://www.ogapmath.com)). The major elements of the framework include problem structures, analyzing evidence of student work and recognizing evidence of underlying errors or misconceptions related to a learning progression for fractions. The work included a study of fractions as numbers, visual models and number lines, equivalence and ordering, equipartitioning and fraction operations. The training included strategies for instruction and also strategies for facilitating professional development around fraction instruction.



Paula Jakopovic



Matthew Timm

“The training we attended was intended for us to become ‘OGAP trained facilitators,’ which is a bit different than the training a teacher would receive,” Jakopovic said. “What was unique about our version of the training was that at times, we would take on the role of ‘teacher participant,’ doing the mathematics and analyzing student work, but then we would often step outside of the training and into the ‘facilitator’s role’ to consider the issues and considerations needed to lead teachers through the training on our own later on.”

Jakopovic and Timm provided this training to the other OPS math coaches throughout the 2015-16 school year and said

they received extremely positive feedback on the content and facilitation of the sessions.

Timm will be an OGAP facilitator in Charleston, South Carolina, in the summer of 2016.

## LPS leaders serve on influential committees

Since becoming a MTF in 2012, Susie Katt, LPS’s K-2 mathematics coordinator, has been able to take the work she does with more than 450 teachers in her district and make an impact at a national level.



Susie Katt

Katt has had the opportunity to serve on several committees: the 2015-18 NCTM Teaching Children Mathematics Editorial Board; the 2017 NCTM Annual Meeting and Exposition Planning Committee for San Antonio; the 2015 NCTM Regional Conference and Exposition Planning Committee for Minneapolis; and the 2014 NCTM Annual Meeting and Exposition Planning Committee for New Orleans.

She also was asked to serve on the Nebraska Department of Education’s Math Standards Writing Team during the 2014-15 school year. She worked on the K-2 subcommittee, which had one-half of its representation from NebraskaNOYCE. Katt also presented in 2012 at a summer training for teachers in Educational Service Unit (ESU) 5, the area near Beatrice, Nebraska.

Katt focuses on teachers in the high-need buildings of LPS, which has helped her grow as a leader.

“I have cultivated relationships

with teachers and administrators that I didn’t have previously. Spending more time in these buildings has provided me with a greater understanding of the specific needs and challenges facing teachers,” Katt said. “It also has helped me identify untapped leadership potential among our primary-level teachers.”

Andrews, LPS’s grades 3-5



Delise Andrews

mathematics coordinator, was appointed to NCTM’s Professional Development Services Committee, of which she was chair from 2014-16. She is also part of the planning committee for NCTM’s newest conference, Innov8, which will be held in St. Louis, Nov. 16-18, 2016.

Andrews and LPS colleague and fellow MTF Darla Berks also presented on NCTM’s “Principles to Actions” at an ESU 13 (area around Scottsbluff, Nebraska) professional development day in February 2016.

“I have long been convinced that I could be better at teaching mathematics. Early in my career, the beauty of mathematics was eclipsed by my determination to teach students rules and procedures. My journey to deeper mathematical and pedagogical understanding began after I had been teaching for many years,” Andrews said. “It started with participation in a math curriculum and book study with several colleagues. Soon thereafter, I had the opportunity to join the inaugural cohort of UNL’s Math in the Middle program. I began to learn that mathematics was so much more than a set of rules to

be memorized. I learned about the many connections between and among mathematical concepts, and I learned how to reason and make sense of the math I was teaching. For years, I had used algorithm after algorithm without understanding, never really knowing why they worked. As I developed an understanding of how and why those algorithms worked, I began to see teaching mathematics as so much more than memorization and drill.”



Alicia Davis

Writing Team in 2014-15, during which she worked with a team of educators from across the state to revise the 2009 Nebraska State Mathematics Standards. She served on the small editing team, and emphasized conceptual knowledge, problem-solving and the creation of standards that promote College and Career Readiness. She also collaborated with educators from across the state in 2015 to identify indicators to be included on the State of Nebraska Mathematics Table of Specifications review.

Davis, the current recording secretary of NATM, also has created and implemented a yearlong professional development series for mathematics teachers in ESU 16 (area around North Platte and Ogallala, Nebraska) since 2013. She structured the course for teachers (middle school teachers in 2013-14, high school teachers in 2014-15 and grades 7-12 teachers in 2015-16) to improve in both

content knowledge and pedagogy topics. Davis utilized a book study to focus discussions, worked with teachers to set goals, and offered feedback throughout the year to support individual teacher progress.

“I have an unwavering pursuit of excellence, and I hold this same high expectation for my colleagues,” Davis said. “I look for ways to promote collaboration, and I have worked to implement change in my new school, such as redefining our math intervention approach and facilitating our professional learning community.”

Davis has presented at the NCTM Regional Conference in 2012, the NATM Math Teachers’ Circle in 2012 and 2015, the NATM Pre-Professionals Conference in 2014, the NATM annual conference in 2011 and 2012, the Nebraska Mathematical Association of Two-Year Colleges Conference in 2014, and Greater Nebraska Math Teachers’ Circles in 2011 and 2012.

Andrews, Davis and Katt have served on the instructional team for graduate courses for teachers participating in other continuing education programs such as Primarily Math, M<sup>2</sup> and the Nebraska Math and Science Summer Institutes (see page 24).

“I believe supporting teachers, upholding high expectations for both teachers and students, and exploring ways to build student understanding of essential math concepts collectively contribute to the success of students in these high-need buildings,” Katt said. “In return, I have grown as an educator. Engaging in conversations with teachers and exploring new avenues in which to reach particular groups of students has added to my repertoire as a teacher.”

## Schools benefiting from fellows’ professional development

Several of the fellows have designed professional development for the other teachers in their buildings, as well as their districts, and become highly involved as leaders in their schools.

LPS TF Sarah Fischbein has been teaching math at Goodrich Middle School for four years and became the math liaison, who attends district meetings and holds department meetings, two years ago. Goodrich, a Title I school with a 73 percent free or reduced lunch rate, has high diversity and behavioral issues, but Fischbein said she has found her passion in working at a high-need school. As a result, she has become a part of many communities at Goodrich.

During her first year, she was the sponsor of a district-funded group called Empowerment, which was geared toward minorities, to empower the students and give them a sense of cultural identity. Since then, she also has been involved in the family engagement committee, which helps plan family nights at the school and works to better inform parents, and the dragon zone committee, in which she helped create lesson plans for the school to teach once a month.

Fischbein’s principal also asked her to be the teacher trainer for the school’s new grading system, participate in a three-day training experience called “Classroom Instruction that Works 2,” and help create a curriculum for summer school along with other teachers from Title I buildings.

“We based the curriculum off concepts we knew students struggled with and tried to

create real-life scenarios to help students see the connection,” Fischbein said. “It was a wonderful experience and allowed me to collaborate with teachers from other schools.”

In an effort to raise student achievement at McMillan Magnet Middle School in OPS, math department head Connie Colton asked McMillan teachers



Connie Colton

to demonstrate ideas on how to incorporate math in all content areas, as well as provide bell work questions targeting specific areas of weakness for the school’s students. Her administration bolstered support for cross-curricular instruction by implementing project-based learning (PBL) on a school-wide basis.

“Through collaboration with science teachers and language arts teachers, students incorporated mathematics skills in their study of local weather the first year of PBL. This year, students invested more heavily into their projects and used mathematics to understand the impact of fast food on health. These projects culminated in student presentations open to the public. As students presented their findings to parents and community members, the positive impact PBL had on students became clear. Many of the typically indifferent, underperforming students had developed a positive attitude toward mathematics and had begun to see mathematics as more than a set of meaningless procedures,” Colton said.

In high-need buildings such as McMillan, which has nearly 80 percent of the students receiving

free or reduced lunches, one of the most difficult challenges is recruiting and keeping good teachers. Over the last five years, Colton has mentored three new teachers and one student teacher and hosted several practicum students. She also recruited three of McMillan’s veteran math teachers to pursue master’s degrees through the OPS Teacher Leader Academy’s (TLA) M<sup>2</sup> program and recruited several K-3 elementary teachers at McMillan’s feeder schools to participate in TLA’s Primarily Math program.

Colton, who has taught the first two courses of Primarily Math to four different cohorts of teachers, continues to provide monthly workshops, designed to illustrate connections between elementary and secondary content, on a voluntary basis to the Primarily Math teachers.

“These informal gatherings provide teachers with an opportunity to extend their learning while maintaining the social and professional network developed in Primarily Math,” said Colton, who also now teaches both math content and pedagogy courses for pre-service teachers at Buena Vista University in Iowa.

Katt, of LPS, also teaches courses for Primarily Math and follows up with her teachers after each cohort ends. Katt has helped teach five of the six Primarily Math courses to three different cohorts of teachers.

Colton’s OPS colleague Jill Luschen has been a cooperating teacher twice since becoming a MTF, has been a mentor to two new teachers, and has led more than 10 professional development sessions at content area meetings, faculty meetings, district meetings and a pre-professionals conference. Luschen also has written curriculum for the district

and been on several committees to pilot new content in OPS. She then became a lead teacher for that content in her building, Alice Buffett Magnet Middle School.

“I have taken the lead working with high-need students in my building,” Luschen said. “I developed curriculum through our homeroom to help students better prepare for NeSA (Nebraska State Accountability exams). I also have continued my work with students after school in our tutoring program. Two days a week I work with high-need students for an hour on building math skills.”

At Paula Jakopovic’s school in OPS, Field Club Elementary, where approximately 86 percent of the students receive free or reduced lunches, the NeSA math scores have improved steadily since the first year of testing and during her time as the building’s math coach.

Jakopovic helps staff to become familiar with new curriculum, understand the importance of using a variety of strategies to develop a deep conceptual understanding of math content, incorporate math talk and student discourse into math lessons and make math engaging and accessible for all students.

She is also an active member of both her school’s student assistance team and instructional leadership team.

“I can honestly say that being a Noyce MTF has given me opportunities that I never dreamed would be possible in my career as an elementary school teacher, some of which push me well beyond my comfort zone,” Jakopovic said.

Fremont Middle School math department chair Edie Ronhovde also strives to make herself accessible to her colleagues and to parents. Ronhovde, a M<sup>2</sup> graduate,



Jill Edgren (right) at Wood River



Jerel Welker (right) teaches Math 802T



Several fellows attend NCTM in Denver in 2013



Connie Colton (left) teaches Math 801P



Edie Ronhovde in New York City



Dan Schaben sits in Thomas Jefferson's backyard at Monticello at a reflection pool during his University of Virginia trip

previously taught sixth grade, then moved up to the middle school to teach eighth grade and went on to become the math chair.

"I am constantly looking for ways to help our department be better at what we do," Ronhovde said.



Edie Ronhovde

"I love coming to work each day, and my goal is to inspire the kids to enjoy math. They do not all have to be 'math wizards,' but

they need to enjoy the process, and they need to want to know the 'why' of the answer and not just the answer."

Ronhovde also serves on the grading committee, which drafts new grading practices that she volunteers to test in her classrooms, and she routinely checks in on all of the new teachers in her building, not just in math. Ronhovde has had the opportunity to teach or co-teach classes in Harlem and Brooklyn, New York; Bentonville, Arkansas; and Macy and Omaha, Nebraska, since becoming a MTF.

For Jason Vitosh of Falls City High School, the leadership Noyce afforded him led to his implementation of changes in planning for both teachers and students. In the past five years, Vitosh influenced his school to go from no teacher collaboration time for math teachers, to meeting as a

department once a month during a school day, to now committing to weekly collaboration time for all math teachers.

As a master teacher of high-need students in a rural community, Vitosh also takes



Jason Vitosh

pride in the evolution of the math course offerings at Falls City. When he began his career, the district had

two distinct learning pathways for students in mathematics: the traditional college-prep route and a route leading to the workforce. First, he advocated for and created courses to expose students to the same college-prep mathematics, believing algebra skills to be a gateway to both college and career success. Soon thereafter, students who entered the high school working below grade level in mathematics were seeing the same curricular content as college-bound students, Vitosh said. Now, the district ceases to offer two different pathways and places all students in the same courses, with a plan to support students who are currently working off of grade level to keep pace with their peers and be successful in Algebra 2 before graduation.

"If I had done nothing else in the last five years, these accomplishments embody my

two most impactful beliefs about education and make my efforts worth it," Vitosh said. "I believe that all students can do mathematics at high levels, and I believe that a teacher's time working with other teachers is equally important as a teacher's time working with students."

#### OTHER LEADERSHIP OF NOTE:

● **Shelby Aaberg, Delise Andrews, Cindy Beaman, Susie Katt, Matt Timm and Jason Vitosh**, along with Smith and co-PI Stephen Swidler, moderated, presented or served on panels at the 2014 Nebraska Summit on Math and Science Education at UNL's Nebraska Innovation Campus on Dec. 8. At the Summit, leaders in math and science education collaborated and worked with attendees to assess the strengths and challenges in ensuring high-quality education in Nebraska. To view slides from the conference, see <http://scimath.unl.edu/conferences/#summit2014>.



Cindy Beaman

● **Cindy Beaman** presented at the Shickley Blue River Cohort Day in Shickley, Nebraska, in January 2016.  
● **Danielle Buhrman, Connie Colton, Susie Katt, Brent Larson, Greg Sand and Anne Schmidt** presented at UNL's Enacting Standards

for Mathematical Practices Conference Oct. 21-22, 2011, which brought together experts from the field of mathematics and mathematics education. The conference discussed the nationwide problem of how to operationalize and implement the processes and proficiencies embedded in the standards of mathematical practice from the Common Core State Standards in K-12 classrooms in meaningful, high-quality ways. Slides from the MTFs' breakout sessions can be found at: <http://scimath.unl.edu/conferences/#esmp2011>.

● **Connie Colton** was invited to review tasks and write solutions for the Illustrative Mathematics Project during its first two years. Colton was a member of a team of experts who compiled a set of mathematical tasks to promote the development of students' reasoning and sense making as related to the Common Core State Standards. Colton reviewed tasks submitted through the task-writing contests for mathematical correctness, bias and readability and alignment with Common Core. Colton also wrote solutions for tasks when they were not provided by the task author and provided alternate solutions when appropriate. Colton's class was videotaped in order to develop a collection of video clips that can be used to illustrate one or more of the mathematical practice standards in action and to shed light on what the standard looks

like in an actual classroom.

● **Jill Edgren** provided professional development at ESU 10 in Kearney on two separate topics and presented at the 2014 Nebraska Educational Technology Association conference.

● **Sarah Fischbein and Brianna Pinquoch** have been selected to plan new math activities as consultants for Camp KSC for middle and high school students at the Kennedy Space Center in Titusville, Florida, in the summer of 2016. Each of them will observe the camps, create a pilot lesson and help enhance the math curriculum for the camps. The 2016 Midwest Regional Noyce Connections conference will be held at the KSC Visitors Complex for Noyce scholars and fellows from all of the Midwest Noyce projects (see page 16).

● **Paula Jakopovic, Jerel Welker and Greg Sand** traveled to Reston, Virginia, in October 2011 with Jim Lewis and Smith for the Conference Board of the Mathematical Sciences Forum, which convened to discuss MET2 in light of the adoption of the Common Core State Standards by a majority of states.

Jakopovic was one of three panelists at a plenary session titled "Teachers' Perspectives on Teacher Education." The panel of teachers discussed what they wished they had learned in college and what they wanted from professional development opportunities.

Jakopovic, Sand, Smith

and Welker led the session "Developing and Supporting Professional Communities of Mathematics Teachers in Nebraska."

In 2012, Jakopovic also co-presented with MTF **Edie Ronhovde** at the NCTM regional conference in Chicago on using non-routine problems to encourage problem solving and reasoning in mathematics.

● **Josh Males**, the math department chair at Lincoln Northeast High School, has moved to the LPS district office this year as part of a plan



Josh Males

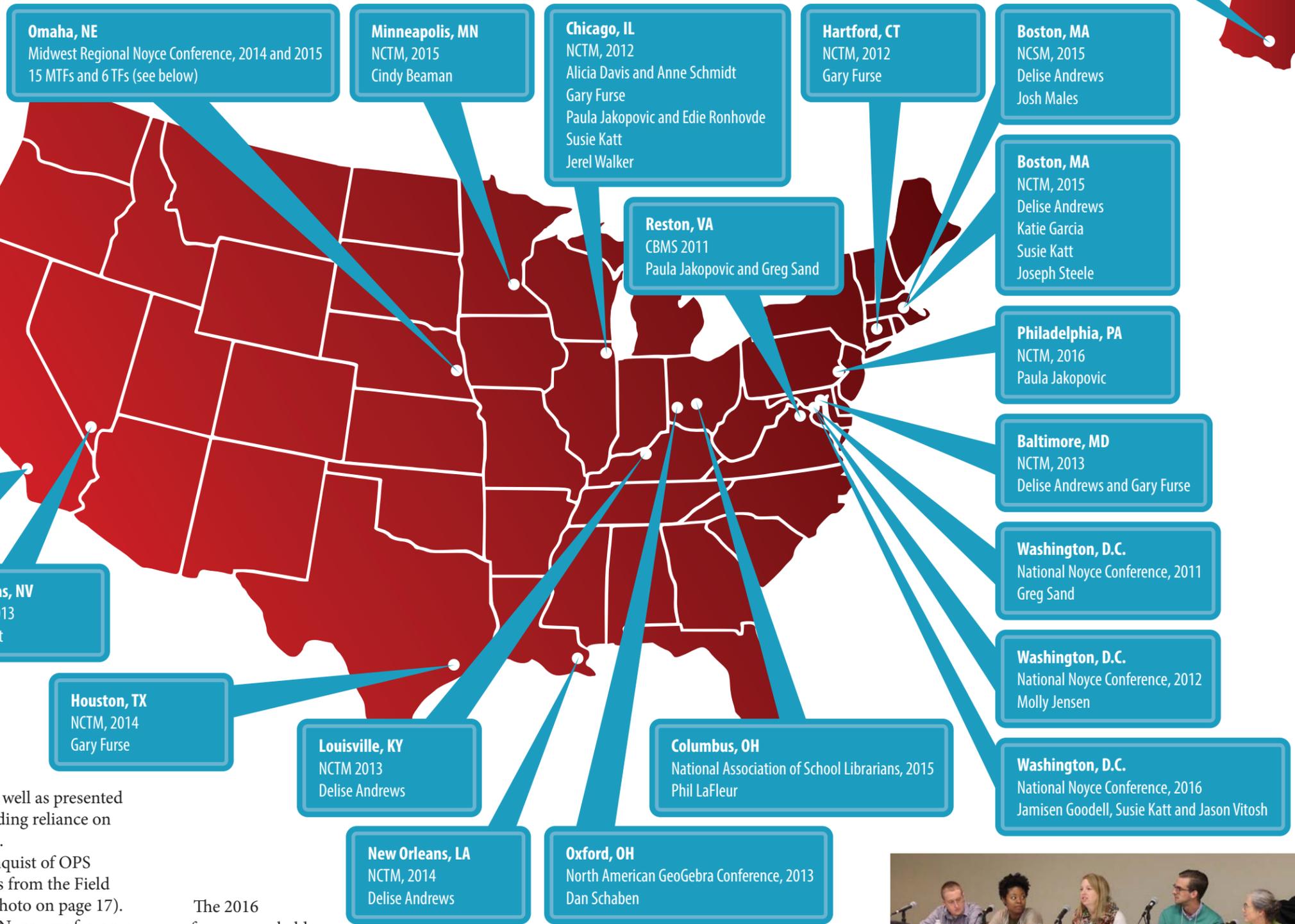
to cover Matt Larson's duties, as Larson assumes his position as the national president of NCTM. Males, who joined the MTF cohort in 2013, started his LPS career at Lincoln High.

● **Dan Schaben** traveled to the University of Virginia's Institute on Academic Diversity in 2012 to study diversified education under Carol Tomlinson. Schaben also has been a part of three school-district evaluation teams in Nebraska: he helped evaluate Shelton under the Nebraska Frameworks, evaluated Franklin Public School under AdvancED ED, and was the associate lead for AdvancED ED's evaluation of Heartland Community Schools. ●

# Sharing Expertise



Brent Larson, Brianna Pinquoch and Pat Janike at the AMTE Conference in 2014



NebraskaNOYCE MTFs and TFs have presented at these conferences:



## Nebraska fellows present at Midwest Noyce conferences

Twenty-one NebraskaNOYCE MTFs and TFs have presented, moderated or served on panels at the 2014 and 2015 Midwest Regional Noyce Connections conferences in Omaha, Nebraska. Another 14 have attended one or both of these conferences (see their 2014 group photos on page 6).

Tanya Archie, a MTF and district math coach for Omaha Public Schools, participated on a coaching panel and presented with MTF Amber Vlasnik on building trust with students in 2014, then moderated the Voices from the Field panel in 2015 (see cover

photo, top right), as well as presented a workshop on avoiding reliance on memory techniques.

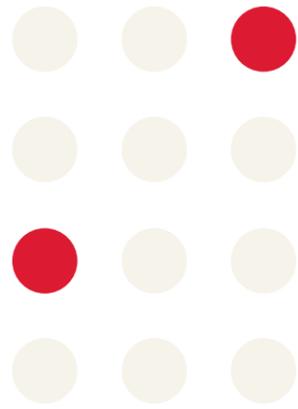
TF Collin Holmquist of OPS served on the Voices from the Field panel in 2014 (see photo on page 17).

Slides from the Noyce conferences can be found at:

<http://scimath.unl.edu/noyce/conferences/2014> and [/2015](http://scimath.unl.edu/noyce/conferences/2015).

The 2016 conference was held at Kennedy Space Center in June and focused on exploring space science in STEM. ●





# Award-Winning Teaching



**1** Shelby Aaberg speaks at the 2014 Nebraska Summit on Math and Science Education.

**2** Greg Sand assists a student at Central High in Omaha.

**3** Sherry West teaches at Lincoln Southeast.

**4** Gary Furse sits near the deck of the replica of the original Mayflower in Plymouth, Massachusetts.

**5** Katie Soto and Alicia Davis hold their National Professional Board Certification awards at a ceremony in 2013.

**6** Pat Janike (left) was presented with his National Professional Board Certification award in 2016 by Matt Larson of LPS.

## Nine MTFs receive national board certification since 2013

Nine Nebraska middle and high school mathematics teachers who are MTFs at UNL have earned National Professional Board Certification since becoming a MTF, seven during the 2013 application cycle, one in 2014 and another in 2015.

Six of the state's nine active Board-certified teachers in mathematics/adolescence young adulthood and five of the 11 in mathematics/early adolescence are MTFs.

Three Nebraska teachers earned certification in any subject in 2015, bringing the total number of teachers in the state with board certification to 117.

The nine MTFs who became Board-certified mathematics teachers during the Noyce program are:

- Shelby Aaberg, Scottsbluff High School, Scottsbluff Public Schools
- Danielle Buhrman, Grand Island Senior High School, Grand Island Public Schools
- Alicia Davis, Scott Middle School, Lincoln Public Schools
- Katie Garcia, Bryan High School, Omaha Public Schools
- Pat Janike, Lincoln High School, Lincoln Public Schools
- Jill Luschen, Alice Buffett Magnet Middle School, Omaha Public Schools
- Dan Schaben, Arapahoe Public School
- Katie Soto, Westridge Middle School, Grand Island Public Schools
- Sherry West, Lincoln Southeast High School, Lincoln Public Schools

These nine teachers join two of their Noyce colleagues who had received this honor previously:

LPS math coach Darla Berks and OPS McMillan Magnet Middle School math department head Connie Colton.

Board-certified teachers are leading the way to improved teaching and learning through effective classroom practices, standards-based instruction and a focus on student achievement. Nationally, the number of teachers who have achieved National Board Certification is equivalent to approximately 3 percent of the teaching force. Almost half of the nation's NBCTs teach in high-need schools and 15 percent are certified in STEM-related areas.

Research shows that students taught by Board-certified teachers consistently achieve higher gains in student achievement compared to peers who are not taught by Board-certified teachers, making learning gains equivalent to an extra one to two months in school.

## Aaberg wins PAEMST, state teacher of year

Shelby Aaberg, MTF at Scottsbluff High School, was honored in August 2015 with a Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST) in Washington (from the 2013 cycle.)

Fellow MTFs Delise Andrews and Jerel Welker also are PAEMST winners, in 2006 and 2007, respectively.

These awards are the highest honor bestowed by the government on K-12 mathematics and science teachers in the U.S. The NSF receives recommendations from states and territories of some of their best and most inspiring teachers for the award. NSF reviews the submissions and forwards recommendations to the White House Office of Science and Technology Policy.

The 2013 awardees, all 7-12th grade teachers, received \$10,000 from NSF and an expense-paid trip to Washington.

During a surprise award presentation Aaberg also was named Nebraska's 2015 Teacher of the Year on Oct. 10, 2014. Nebraska Commissioner of Education Matt Blomstedt presented him with the award.

Scottsbluff Public Schools Superintendent Richard Myles said leadership is one of Aaberg's most important talents.

"His dedicated passion for students combined with his deep understanding of great teaching provides an exemplar for all teachers in our district," Myles wrote in his recommendation of Aaberg. "His expectations of excellence – of himself and of his students – are such that he empowers others to develop a greater belief in themselves."

Aaberg is also proud of an

award he won during a trip with all of the State Teachers of the Year in July 2015 at the International Space Camp in Huntsville, Alabama. Aaberg won the "Right Stuff Award," for the individual that demonstrates the strongest leadership.

"I may be the only Nebraskan that has ever won the award," he said. "The person that hung the medal around my neck was astronaut Dottie Metcalf-Lindenburger."

**2016 NEBRASKA TEACHER OF THE YEAR:** Congratulations to Schaben for being one of five finalists for the 2016 Nebraska Teacher of the Year award. Schaben was recognized as an Award of Excellence winner.

## Archie, Sand named Buffett award winners

PS teachers Tanya Archie and Greg Sand, MTFs,

won the Alice Buffett Outstanding Teacher Award in 2013 and 2011, respectively. Each won \$10,000 from the Susan Thompson Buffett Foundation.

Archie, a math coach, and Sand, a teacher at Central High, also received a medallion and \$500 in McDonald's gift certificates. The award, presented since 1988, annually goes to 15 OPS teachers. The award is named for an aunt of Omaha investor Warren Buffett who taught in OPS for over 35 years.

### UNL College of Education selects West for award

Sherry West, MTF of Lincoln Southeast, was a 2011 Freda



Sherry West

Battey Distinguished Educator Award winner, presented by the UNL College of Education and Human Sciences. The award is given

each year to an exemplary Nebraska secondary school teacher who has demonstrated excellence in teaching and support of students in extra-curricular activities. West received a check for \$6,000, and her school received \$3,000.

"The Battey Award was extremely rewarding since a person can only be nominated by a former student going into education themselves," West said. "It meant so much to find out that one of my former students viewed me as one of the role models for the type of teacher she wants to be. Being singled out for recognition in a room full of people you hold in the highest regard is an experience that fills you with an almost overwhelming sense of gratitude for all you've been given in this life."

### OTHER AWARDS OF NOTE:

Each year since 1992, the Lincoln (Neb.) Rotary Club #14 proudly presents the Donald W. Miller Math Recognition Award, recognizing outstanding mathematics educators in the Lincoln area. The club endowed this award in honor of former member, past club president and Rotary leader, Donald W. Miller, a former UNL mathematics professor. Noyce teachers **Susie Katt** (2009), **Sherry West** (2011), **Jerel Welker** (2013) and **Delise Andrews** (2014) have been recipients of this award.

Amber Vlasnik, MTF, of Lincoln High School, won the Miss



Amber Vlasnik

Myrtle Clark Outstanding Mathematics Educator Award and \$1,000 in April 2016 from the Lincoln Public Schools Foundation. The award is given to

recognize excellence in mathematics teaching and provide a source of funding for LPS mathematics educators for summer school courses to advance teaching skills or for pursuit of an advanced degree in mathematics.

Gary Furse, MTF and math department chair of Pound Middle School in LPS, was a February 2012 recipient of the Lincoln Journal Star's A+ Educator award. He was nominated by one of his students, Hailey Bunde, who said, "The first thing that really makes Mr. Furse different from other teachers is the fact that he really teaches algebra. With past math teachers, they just tell you what to do, but not necessarily why. ... He's made algebra way more understandable than I thought it could be." ●

## DISSERTATION

### Darla R. Kelberlau-Berks, Ed.D., 2015

*Examining Factors of Success in Math: A Case Study of African-American Males' Math Achievement*

This study examined the complex topic of the achievement gap that exists with many African-American male students. Parting company with previous studies of the under-achievement of African-American students, this study considered factors that have led to success in high school math achievement by listening to the voices of six African-American male students. Using in-depth individual interviewing as a methodology, the study investigated the students' perspectives on the impact of the teacher, instructional strategies and the students' own beliefs about their math abilities. The following themes were found to be significant to the success of these six African-American males:

- Factors related to self (including ideas related to attitude toward math, view of own mathematical abilities, and the role of race).
- Factors related to the teacher (including engaging learning tasks, positive classroom environment, and a display of care for students).
- Factors related to the support of learning (including access to help, involvement in school and other supporting adults).

Contrary to other research findings, the role of race was not clearly identified as a significant factor.

Of the 30 MTFs, 13 currently are pursuing a doctorate in Educational Studies at UNL, and one already has graduated.

Lincoln Public Schools math coach Darla Berks was one of six MTFs who began her coursework in Summer 2011, near the onset of the Noyce grant. She graduated in May 2015, and said she benefited from taking courses with people in a variety of professions and areas of interest, after taking courses with a cohort of teachers for her master's.

"Through many of the courses I took, I frequently came back to the idea of the great importance of teachers. Although that's not a novel idea, I was often reminded of that in regard to how important my professors were to me throughout my doctoral journey," Berks said (see Berks' dissertation title and abstract on page 20). "They pushed my thinking much further than I thought possible."

Omaha Public Schools teacher Connie Colton agreed.

"Throughout the formal courses I have taken toward my doctorate, the thing that has impressed me most is the depth of knowledge of the instructors teaching the courses, and the true passion for both teaching and the content these instructors exhibit," said Colton, who is now prepping for her comps. "I have learned far more than will be shown by any degree and have felt more supported throughout the process than I ever thought I would be. The journey to date has been extremely fulfilling."

Greg Sand of OPS and Pat

# Pursuing Doctorates



COURTESY PHOTO

Darla Berks (second from left), her husband and daughters after her Ed.D. graduation

Janike and Susie Katt of LPS are also preparing for their exams.

"As I round the curve toward the end of my coursework, I feel fortunate to be able to spend time studying aspects of mathematics education that have sparked my intellectual curiosity," said Katt, a district math coach who began Noyce in the summer of 2012 along with her doctoral work. "I have gained an appreciation of the influences the history of mathematics has had on the world of math education as well as the shared values among the community. When I've had the opportunity to study what is most important to me, I feel as if I can't learn enough – and the more I learn the more I realize there is to know."

Besides the five LPS and five OPS teachers working on doctorates, the other three are teachers in Fremont, Grand Island and Superior.

Grand Island teacher Danielle Buhrman currently is writing her dissertation and expects to graduate by May 2017.

Buhrman said that earning this degree is for her personal growth, and Jessica Thompson agreed.

"I have enjoyed the courses about conducting research more than I ever expected," said Thompson of Superior Jr/Sr High. "My goal is to build a strong pedagogical foundation to become an educator like Dr. Yvonne Chan, who put her learning into action to change the lives of her students."

For Paula Jakopovic of OPS, who began her doctoral work before Noyce, her ultimate goal is to become a college professor. She is earning a Ph.D., as is Josh Males of LPS and Matt Timm of OPS, while the other MTFs chose Ed.Ds.

Jakopovic is using her experience with Noyce and as a coach for her school and district for her dissertation.

"Shadowing six of the other district math coaches gave me insights into the role of the coach that have helped me to improve the work that I do with teachers in my own school. I also, unintentionally, began building questions and conversations in and among the coaches about how we plan for and reflect on our work with teachers," said Jakopovic, who expects to graduate in May 2017.

"The experiences I have had along the way, as a classroom teacher, as a Math in the Middle student, as a math coach, a Noyce MTF, and now as a doctoral student, have all helped me to grow and prepare me for the next part of my professional journey," she said. "I truly would not be where I am today, or where I will be in five years, without the inspiration and support I have received every step of the way from my mentors and NebraskaMATH." ●

# Seizing Opportunities

Not many people can say they have shaken a President's hand three times in four months, as Shelby Aaberg can.

Two of those three times almost didn't happen.

Aaberg, a Noyce Master Teaching Fellow, was scheduled to fly to Washington on April 25, 2015, for the celebration of the State Teachers of the Year at The White House.

His wife, Laura, went into labor with their second child on April 24, and their son, Emmett, was born that afternoon.

The 2015 Nebraska Teacher of the Year changed his flight to April 26 and arrived late to the initial event, held at the home of Vice President Joe Biden. (Small world: He discovered the guard at the Naval Observatory gate was his distant relative.) Later that week, Aaberg shook President Obama's hand in the Oval Office before all of the teachers were honored at the Rose Garden in an outdoor ceremony.

Little did he know an upcoming second hand shake was about to be captured on TV, in front of a huge crowd outside. [A video of the recognition event can be found at <https://www.youtube.com/watch?v=efilOT3cQrM>.]

"Dean Aamodt, the 2015 North Dakota Teacher of the Year and a music teacher, had written a song for the President that all of us sang. The President was surprised by this and decided to walk through the crowd of teachers to exit the ceremony. As he walked through the middle of the crowd, my heart started racing. I thought, 'I am going to get to shake the



COURTESY PHOTO

Shelby Aaberg (top left corner) shook President Obama's hand at the end of this outdoor ceremony at The White House, honoring all of the 2015 State Teachers of the Year.

President's hand again, this time in front of all these people," the Scottsbluff High School teacher said. "Immediately after the hand shake, my phone buzzed in my pocket. Lora Sypal, the Nebraska coordinator of the Teacher of the Year program, had actually screen-captured photos of my handshake immediately after it happened. The photo is my background banner on my Twitter profile."

Aaberg's second trip to Washington in 2015 was unexpected. After applying for the Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST) in 2013 and becoming a finalist, it wasn't until the summer of 2015 that he was told he had won the 2013 award.

This time, he made sure to bring his wife along on the trip, since traveling in April was out of the question for her. On the second trip for PAEMST, he shook President Obama's hand a third time.

Aaberg also got to visit

Jim Lewis, former PI of the NebraskaNOYCE grant, at the NSF during a professional development day for the PAEMST winners.

"Teaching is the single most important human endeavor," Aaberg, a 10-year veteran teacher said. "The teaching profession needs more opportunities to recognize teacher leaders and to distinguish exemplary classroom practice. For these reasons, I wanted to become a Noyce Master Teaching Fellow. Many of the professional opportunities that have come my way have been a result of my involvement with the Noyce program."

A Gering High School graduate, a school found in the far western Nebraska Panhandle, Aaberg earned a bachelor's degree from UNL and a master's degree at the University of Nebraska at Omaha in mathematics education, as well as endorsements in assessment leadership and English as a Second Language. He is currently working on his doctorate in education at UNL.

He spent his first two years as a high school educator at Omaha Westside High School, but moved back to the Gering area to Scottsbluff, to be closer to his wife's family. At Scottsbluff High School, where 40 percent of the students are Hispanic and approximately 54 percent of the students receive free or reduced lunches, Aaberg started an AP Calculus course, as well as Math Club, and has been the sprint coach since 2006. He coached the girls team to a state championship in 2007 and the boys team in 2012.



The teaching profession needs more opportunities to recognize teacher leaders and to distinguish exemplary classroom practice."



Shelby Aaberg, Noyce Master Teaching Fellow

In 2015, Aaberg also led his Math Club students to earn a Class II Math Bowl first-place finish at UNL Math Day, one of his proudest accomplishments (see photo on page 40).

"I took 49 students and four adults on the 400-mile trip to Lincoln," said Aaberg, who has been the math department chair since 2012. "This marks the fourth year we have taken roughly 50 of our students to the math contest. In 2006, my first year at Scottsbluff High, I took four students in a Crown Victoria. The math contest has become an annual highlight of students' experience at Scottsbluff, due in part to many people involved with Noyce."

Aaberg, who is active in several professional organizations, including the NATM, NCTM, the Nebraska Council on Teacher Education and the Scottsbluff Education Association, has taught almost every course at Scottsbluff. Currently, he teaches AP Statistics, Precalculus/Trigonometry, Geometry, and a STEM course he authored in 2008 titled "Mathematical Theory and Problem Solving," which is an elective math course where the students prepare for contest mathematics and do project-based learning.

Previously, he has served

as the Scottsbluff building coordinator for English Language Learners and the High Ability Learners as well as National Honor Society (NHS) sponsor, during which he installed a community service requirement for NHS inductees. He has helped select the district's elementary mathematics curriculum and has represented the district on the Teacher Principal Evaluation Revision Pilot.

Aaberg did not begin his college years in teacher education. He started out in chemical engineering, but he found he did not have a passion for it. The influence of two math teachers he had while growing up led Aaberg to change paths. He also had enjoyed playing school as a child, using his brother, Sean, as his first "student."

Over the past few years, Aaberg said he has learned that leadership is rarely about position and more about empowering others. He has enjoyed traveling around the state to observe the classroom teaching of the other fellows and has taken the lead on building connections between them.

During the 2014 Midwest Regional Noyce Connections Conference in Omaha in October, the Nebraska MTFs in attendance were sitting in a circle between

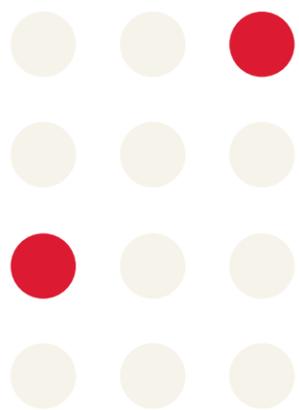
sessions, sharing ideas. The group agreed it would be beneficial to have an easy way to continue to share ideas with one another after the conference. Aaberg pitched an idea for a Sunday night Twitter chat, and with that, #noycechat was off and running.

These weekly chats during the school year are usually moderated by Aaberg, but guests are welcome to come up with a theme and questions and lead the discussion. All Midwest Noyce personnel are invited to participate.

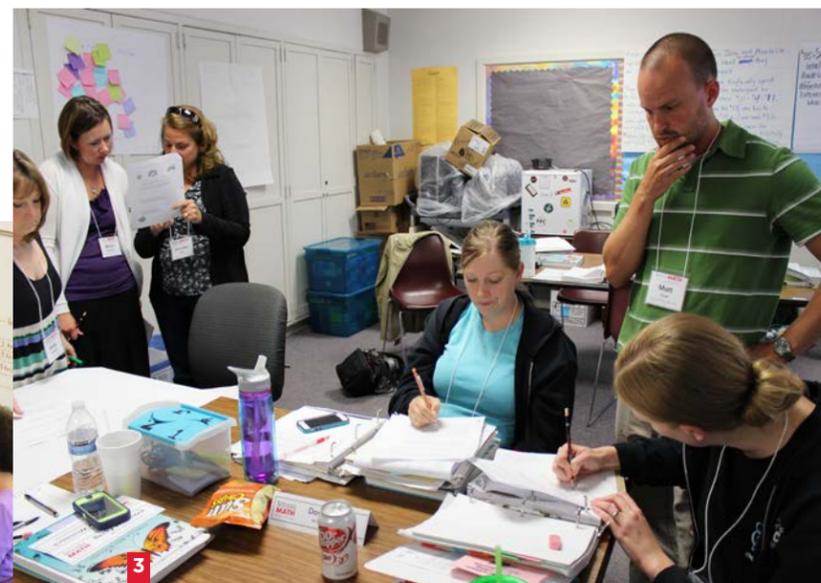
Aaberg uses Storify to archive #noycechat, which can be read at <https://storify.com/ShelbyAaberg>.

Aaberg said the Noyce program has shown him that he is not alone in his craft and that resources are out there to empower him to do better for his students.

"The late night conversations with Dan Schaben and Jason Vitosh, the summers we roomed together at UNL and stayed up all hours working on mathematics problems for our Noyce graduate courses, were spectacular," Aaberg said. "I have gained lifetime friends, colleagues I can trust, colleagues in front of which I can remove my professional armor and be a vulnerable, imperfect teacher doing the best I know how." ●



# Teaching Peers



**1** Kesha King (center) co-teaches Math 802P for OPS TLA Primarily Math in 2016.

**2** Delise Andrews (standing center) leads instruction for Math 803P in the NMSSI in 2013.

**3** Matt Timm (standing at right) assists with Primarily Math in OPS TLA in 2013.

**4** Lead instructor Katie Garcia (far right) leads the demonstration of a math problem in Math 804P for ITEAM in OPS TLA in 2015.

**5** Alicia Davis (center) assists in a Math in the Middle course for LPS teachers in 2015.

**6** Jill Edgren (left) teaches Math 804T in the NMSSI in 2013.

By working with the 30 MTFs and 12 current TFs throughout Nebraska, Noyce increases the leadership capacity of mathematics education. The UNL Center for Science, Mathematics and Computer Education supports these teachers in their efforts to not only offer more professional development in mathematics to teachers, but also to contribute to the development of a cadre of truly outstanding teacher leaders capable of providing high-quality professional development to their peers.

NebraskaNOYCE provides for MTFs the opportunity to be part of an instructional team offering graduate education courses for other teachers. Over the past five years, all 30 MTFs and four of the TFs have been a part of an instructional team for a course in either the Nebraska Math and Science Summer Institutes (NMSSI), the NebraskaMATH

Omaha Public Schools Teacher Leader Academy or the UNL-LPS Professional Development Partnership.

The 30 MTFs have served on between two and 11 instructional teams each, with the average across five years at five, and 23 of the MTFs have served as a lead instructor at least once. The four TFs have served on a total of six instructional teams. MTFs also have served as teacher liaisons (mentors) for novice teachers, including serving as the cooperating teachers and then the mentors for TFs.

“I have been fortunate to cooperate with three student teachers in the last two years, and I truly feel they have strengthened my abilities as much as I have assisted them,” said Kesha King, a MTF in OPS at Chandler View Elementary. “You want to ensure that you provide future teachers with the best arsenal of tools to

help future students gain mastery of the concepts.”

MTF Jason Vitosh of Falls City High School, who has taken graduate courses at UNL before and during his Noyce fellowship, said he has seen and appreciated the commitment of UNL to develop worthwhile courses for teachers, but his experiences teaching the NMSSI courses have been even more valuable.

“The decisions I have to make when considering what other teachers need for their own classrooms have made me grow as a teacher in ways that I never thought possible,” Vitosh said.

Self-reflection, for both the MTFs and the teachers in the courses in the role of student, is a powerful outcome of providing this professional development opportunity. LPS building math coach Anne Schmidt relies on this feedback, whether verbal or non-verbal, to help refine or

direct her instruction. Teaching your peers puts your own practice under a microscope, added MTF LPS teacher Alicia Davis, but the role brings a certain credibility that other instructors might not as easily earn.

It’s also important to be humble, said TF OPS teacher Collin Holmquist, adding that the teachers instructing have to want to improve their own teaching and not just be there to share their own methods as the best way to teach – teaching and learning go together.

“I am constantly surprised by the different approaches to solving a problem or to answering a question that appear in every class for teachers,” said Gary Furse, a MTF in LPS. “I have come to realize in many instances that I was stuck in old habits that were not necessarily aligned with my own teaching philosophy. I have been able to make changes in my pedagogy that are more

effective and in tune with my own practices.”

Teachers as the students also can ask some tough questions, so deep content knowledge is essential. OPS TF Jamisen Goodell discovered this quickly in his first experience as a teaching assistant in the summer of 2015.

“You really have to know the content you are teaching, because if you don’t, they will find it. You have to be extra prepared. It can be intimidating helping teach a class where some of the teachers in the class have been teaching longer than I have been alive,” Goodell said. “It’s a reminder to me that age is not a qualifier for knowledge. It gives me confidence for teaching and leading in my high school when I can feel comfortable teaching peers.”

Goodell’s cooperative teacher during his Noyce fellowship, MTF Sherry West, said teaching teachers from all grade levels has

also broadened her perspective: “I have a better sense of the issues faced by elementary and middle school teachers as well as the scope and depth of the curriculum students have seen before they get to high school.”

Lincoln High School MTF Pat Janike has had the opportunity to teach or assist with six different classes involving educators and pre-professionals, including UNL’s math methods course.

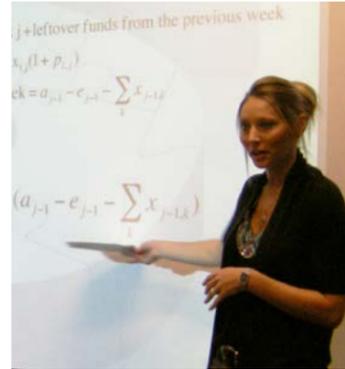
“Interacting with other teachers causes me to reflect on my own beliefs and take action to improve my own practice,” Janike said. “These experiences have challenged me to further my own understanding.”

The broad impact of building this knowledge for both MTFs and for educators across the state, working together, has the great potential to increase K-12 student success in the discipline of mathematics. ●

# Interacting with Faculty



UNL's Dr. David Pitts (right) teaches Math 807.



Katie Soto presents in Math in the City.



Jason Vitosh and UNL's Dr. Tom Marley in Math 810T.

As one component of supporting Master Teaching Fellows with professional development opportunities, each MTF was awarded the opportunity to take eight graduate courses (24 credit hours) in mathematics and mathematics pedagogy at UNL, taught by NebraskaNOYCE co-PIs and other UNL faculty.

The effects of this interaction between master teachers and university faculty has broadened the perspectives of both groups and established an open line of communication for asking questions and identifying resources.

Each MTF outlined an education plan as part of his or her application to NebraskaNOYCE. Several MTFs took three graduate courses in the summer of 2011, a diversity course in the fall of 2011, an applied mathematics course in the spring of 2012, and at least two courses in the summer of 2012.

While mathematical content knowledge deepened for the master teachers, their instructors gained an appreciation for the classroom interaction and curriculum awareness of these teachers.

UNL Professor of Mathematics David Pitts taught in-service teachers for the first time in his career in 2011 in Math 807, a NebraskaNOYCE course.

"I found the Noyce teachers very talented, hard-working and eager to gain mathematical knowledge," Pitts said. "When I began the course, I was uncertain what it would be like having in-service teachers as students, but the great thing about that was that they brought perspectives about mathematics and how to teach it which I had never seen, and which would be impossible for pre-service teachers to have. For example, they could look at a textbook and talk about how

the activities suggested in the textbook would work in a high school classroom and could say how they'd do things differently."

UNL faculty, staff and graduate students often visit the classrooms of the MTFs. Lincoln Public Schools teacher Alicia Davis appreciates these visits and the willingness of university contacts to discuss instructional practices with her.

"Their guidance and encouragement pushed me to challenge myself to pursue professional opportunities outside of my comfort zone," Davis said.

To meet the needs of the MTFs who are pursuing a doctorate, in the summer of 2011, then-PI Jim Lewis invited Denise Spangler, associate dean of the College of Education at the University of Georgia who is well known nationally in math education, to come to Lincoln to teach a Noyce course. Ruth

Heaton and co-PI Wendy Smith co-taught this course with Spangler. The course was created as a new version of an existing course, TEAC 949A: Seminar in the Curriculum and Teaching of Secondary Mathematics.

In summer 2012, Smith created another new course for MTFs, TEAC 923: Seminar in Mathematics Education. This course was based on one Spangler taught the previous academic year to mathematics education doctoral students at Georgia. In addition to those teachers pursuing a doctorate, the course also attracted three other MTFs and six other graduate students interested in research in mathematics education, making it one of the most exciting learning opportunities for doctoral students interested in mathematics teaching that UNL has ever offered.

"It has been an honor to teach courses to the MTFs," Smith said. "I always learn so much when engaged in rich discussions around mathematics teaching, learning and assessment, with master teachers. Developing reflective teachers is a goal of many of our professional development courses and activities. The MTFs are deeply reflective, and thus are able to help lead such activities for their peers."

In the fall of 2011, a special online section of TEAC 840D: Culture and Schooling was offered to MTFs and the first cohort of TFs. Taught by Noyce co-PI Stephen Swidler, the course focused on issues of diversity and equity related to mathematics teaching and learning.

In the spring of 2012, Math 816T: Math in the City for Teachers was developed and taught by two UNL professors in mathematics. Math in the City is



Wendy Smith



Stephen Swidler

an applied course that involves learning the mathematics needed to consult with a local business or government agency about an issue it faces.

"Working with UNL faculty has been a not-so-gentle reminder that I don't know everything," said Greg Sand, a MTF with Central High School in Omaha. "However, my teaching has been enhanced by these interactions. For example, working with Ruth Heaton has helped make my thinking clearer to students. Working with Wendy Smith has exposed me to research that I was unaware of and how to utilize it in teaching. Working with Brian Harbourne helped expand my understanding of mathematics. Because of these interactions, my professional life has grown to a greater extent over the past five years than it did in the prior 14."

MTF Shelby Aaberg said he has gained valuable perspectives from the university with respect to leading NATM and expanding professional development opportunities for math teachers.

"Access to exemplary faculty like Jim Lewis, Wendy Smith and Michelle Homp has helped me learn about professional development opportunities for not only myself, but also my colleagues, and working with graduate students has reinforced to me the importance of developing pedagogical content knowledge," Aaberg said. "The staff at the Center for Science, Mathematics and Computer Education – namely,

Lindsay Augustyn, Stephanie Vendetti, Jane Kaufmann and Brenda West – have gone to great lengths to keep me informed about these opportunities."

Growing the professional networks of the MTFs has been an important component of NebraskaNOYCE. LPS district math coach and MTF Delise Andrews understands that the vast amount of dollars and time invested by UNL and LPS equipped her to do the curriculum development work in which she is involved. She also now can reach out to math education experts across the country for help with a pedagogical strategy or mathematical concept.

Omaha Public Schools MTF Paula Jakopovic has developed relationships and built resources not only with current and former graduate students along her journey as a coach and to earning her doctorate, but also with professors at the University of Nebraska at Omaha, which began its own Noyce grant in 2015.

Perhaps most notably, this network gives master teachers more credibility and confidence. Gary Furse of LPS successfully campaigned to place tables in math classrooms instead of individual desks to promote better learning environments in math.

A former Math in the Middle participant, MTF Phil LaFleur of OPS knew he wanted to take advantage of the value Noyce and its courses would bring.

"When the opportunity to work with Jim Lewis and Wendy Smith as a Noyce MTF came around, I couldn't pass it up," LaFleur said. "I cannot begin to quantify what impact my interactions with UNL have had on my professional career. I would not be the teacher I am today." ●

# Defining Rural



Dan Schaben of Arapahoe (school at right) shared these photos of plowing a February 2016 snowstorm, which closed schools across Nebraska for several days.

Geographical distances across Nebraska are large and add to the challenge of offering professional development and building a network of teacher leaders. Nebraska is about 77,000 square miles, making it the 16th largest state in the country, though it is sparsely populated. Ninety-three percent of the state's total land area is dedicated to agriculture. Over half of the state's 1,882,000 citizens reside in the eastern part of the state in two metropolitan areas, Lincoln and Omaha.

Seventeen of the Noyce fellows teach in Omaha Public Schools, and 14 teach in Lincoln Public Schools. The other 11 work in areas referred to as "rural" and are spread out across the state. By using "rural" in this sense, grant leaders are doing what Farmer (1997) says some people do to define rural, "the rural is whatever is left over after the urban has

been defined" (p. 624). For NebraskaMATH projects, rural is typically whatever is "not Lincoln and Omaha."

However, this simplistic classification reveals the difficulty in defining "rural" in Nebraska, and the different set of issues rural teachers face when compared to urban teachers.

During the Math in the Middle (M<sup>2</sup>) grant, a high percentage of teachers were considered to be from rural areas, leading UNL researchers to study the issues they faced (see box on page 29). A prominent theme that emerged was a sense of isolation. While teacher isolation (Lortie, 2002/1975) is not an inherently rural phenomenon, it was one quite apparent within the M<sup>2</sup> data. For example, many M<sup>2</sup> teachers reported there was no one of whom to ask questions regarding mathematics or teaching. Many have no time for collaboration.

Some rural teachers comprise a school's entire math department. Other rural teachers are part of a math department with just one other teacher. Some rural teachers feel like community outsiders, living in one town but teaching in another. Desire to collaborate with others around matters of curriculum, instruction and ways to engage students were top priorities for most teachers.

These feelings of isolation are echoed in recent discussions



Sonja Ann Kalkwarf

with the 11 Noyce fellows working outside Lincoln and Omaha. TF Sonja Ann Kalkwarf of Cedar Bluffs High School is the only math teacher for grades 7 through 12.

Her first year teaching, she had nine preps, for classes ranging from Algebra 1 to Calculus 1. Kalkwarf also is responsible for making sure the curriculum aligns with state standards since her district has no curriculum specialists.

She agreed with the M<sup>2</sup> teachers that it's easy to feel like an outsider. "I am not from the area where I teach, nor do I live near it. I commute 45 minutes each direction," she added.

MTF Jason Vitosh of Falls City in the southeastern corner of the state, is the only person teaching the math courses that he has, and, while he can collaborate with the other two math teachers and discuss students and ideas, he is doing all of the prep, planning and reflecting on his own.

"It is easy to feel isolated and unsure of your choices or to fall into an ineffective routine that takes longer to realize and change without other teachers working on the same classes," Vitosh said. "There is no turnover at my school, which can be a positive, but it can also leads to comfortable, stale or outdated ideas. That is why reaching out and finding the Noyce Fellowship was vital to maintaining my growth as an educator and probably saved my career, keeping me in education by connecting me with other teachers outside of my own school."

Jessica Thompson, a MTF in Superior, has seven different preps and teaches eight class periods without a planning period. However, she said she enjoys having the freedom to adjust her curriculum as needed.

Expectations on teachers' time are also different for rural teachers. Essentially, you are always "on the job."

## STUDYING THE AMBIGUITY OF 'RURAL'

Math in the Middle (M<sup>2</sup>) (2004-2011) grant leaders, including Noyce PI Wendy Smith, interviewed M<sup>2</sup> teachers to research the ambiguity of rural in 2007-08.

Researchers found that teachers in areas called "rural" did not necessarily refer to themselves that way, and sometimes even teachers from the same town did not agree on whether to call themselves rural. These sentiments have not changed amongst Noyce teachers.

When interviewing two M<sup>2</sup> teachers working in far western Nebraska, nearly 500 miles from Lincoln, in a town of 9,000, amidst vast ranches, one teacher said: "Oh, yes [we are rural] ... Just the fact that it's so community-based and there are ranchers, which contribute so much to what's happening there. We're far away from anything that's city life. ... If we want to shop, we often times drive three hours to Rapid City or three hours to Cheyenne and that sort of thing; so we're pretty rural."

Yet another M<sup>2</sup> teacher working in the same town seemed slightly put off by the question of whether she considered the school she taught in rural. She commented, "Kind of, in the Lincoln sense. You guys think we are rural, but I don't think we are. To us, rural schools are the small, small, small country schools. ... We're in town. We're not, you know, clear out in the middle of nowhere."

Another M<sup>2</sup> teacher from a town of 14,700 near the western border of the state compared his town to towns around it and said, "Out there,

we consider ourselves not one of the rural schools, because we have all the smaller ones like Bayard, Bridgeport and Gordon around us. I mean all those really small towns. So since we're the biggest one out there, we don't feel rural, but in the big scheme of everything, we are considered rural."

Still others defined rural as proximity to shopping and other services. A M<sup>2</sup> teacher from a town of 6,000 noted, "I wouldn't say my town is rural, per se, because we have a lot of amenities that even Lincoln has. You know, we've got a Walmart, we've got a hospital, we've got those kinds of things." Another teacher from a town of 8,000 remarked, "There are times when I think my town is big, because we do have things to offer, but as soon as I get anywhere else and I see the traffic, I realize we're very rural."

There were still others that researchers found had less tangible ways of defining rural, based on feelings, sometimes intermixed with more measurable ways.

A M<sup>2</sup> teacher from a town of 300 offered her definition of rural: "It just has a feeling of a smaller town ... the attitudes of the people and the pace of the people make it rural ... an attitude of calmness, I guess. Not to beat out the other guy, but to help the other guy, I guess; I think it's rural versus the city people and we're kind of all in it together, so it's a community effort on anything we do ... you get a real sense of community because the community is small enough that everyone has a stake in everything that goes on."

"I am always Mr. Vitosh, the high school math teacher. I cannot avoid representing my school and my profession at any time. Everyone in a small town knows who you are – they are either

a parent, grandparent, former student or future student," Vitosh said. "Teaching in a small, rural district is a lifestyle, not just a career, and definitely not just a job."

Dan Schaben, MTF at

# Rising to the Challenge

Arpahoe Public School, described it as feeling “famous.”

“I talk to parents on a daily basis because I see them downtown and talk with them. They know me, and I know them. There is some safety in that, but that’s part of the reason that outsiders often feel unwelcome in a small town.”

Schaben added that it’s also a struggle to find not only enough teachers to cover all of the courses students need and want, but also to attract qualified teachers to fill open positions.

“Our district also doesn’t have computer programming courses. We have a great agriculture program, but it can only focus on crops and animals,” Schaben said. “An instructor may teach seven preps a day, coach three sports and drive the bus.”

Schaben and other rural teachers expressed the difficulty of teaching around their students’ involvement in sports and extracurricular activities. In a small school, students may participate on multiple teams and miss class for several days. At Kalkwarf’s school, there is a policy that if more than half of the class is gone for an activity, then there is not supposed to be new material presented that day.

However, if these students are struggling, said Schaben, they are easy to identify. “Our staff is small, so when a student is struggling, we can usually zero in on the behavior because they are doing the same thing in multiple classes,” Schaben said. “My class sizes are small, less than 18, and sometimes can be just one student. Students can get a ton of one-on-one help.”

Three of the Noyce MTFs teach in Grand Island, near the center of the state. With a

population of nearly 50,000, Grand Island is the fourth-largest city in Nebraska – the epitome of the ambiguity that surrounds defining rural. Teachers in Grand Island experience issues that face not only rural teachers, but also urban teachers.

Danielle Buhrman teaches math at GIPS’ only high school. She said the perception that Grand Island is rural presents a challenge, due to the composition of the city’s population. Hispanic students make up 49 percent of GIPS.

“To people not familiar with Grand Island, they see us as a large farming community in the middle of the state surrounded by fields. Except, most of my students have never set foot on a farm, and our high school is larger and has more minority students than any of the high schools in Lincoln. As a result, we have some of the same ‘issues’ that Lincoln/Omaha teachers face, but we generally have to justify those issues,” Buhrman said. “People don’t think a community in the heart of farm-country Nebraska will have such a high English-Language-Learning, free or reduced lunch, minority (which is actually the majority), or behavior/mental health population. They don’t understand how much work we put into our kids, how much of our aid must be distributed to these specialized programs and how much our students must overcome to find success and independence.”

While the district used to have its teachers work as more of a K-12 team, elementary math coach Cindy Beaman said they now work in separate small groups connected to grade level or specific content. While Beaman collaborates with the primary teachers, Katie Soto communicates with the middle-level teachers and

Buhrman with the secondary.

Not unlike other small districts in Nebraska, GIPS also does not have any math coordinators or a mathematics curriculum specialist.

“This makes for a constant effort to keep the teaching and learning of mathematics at the forefront,” Beaman said. “Without the networking of other Noyce fellows and those from UNL involved in NebraskaMATH, it would be a very lonely endeavor.”

One thing all rural teachers could agree on was the benefit to teaching in a small community: the close relationships you build with your students.

Thompson said she teaches most of her students for four of their secondary years, establishing a bond often in seventh grade. She also strives to contact parents regularly, especially in high-need families, to help build that bond.

Kalkwarf agreed: “I know who loves to sing, who spends every available weekend hunting or fishing, who has younger siblings to take care of, who has ailing parents who they are worried about, and what their dream jobs are.”

Even though its population is large, Grand Island Senior High is the only high school, “so there is no ‘good school’ or ‘bad school,’” Buhrman said.

“We gain a lot of perspective and appreciation for others’ backgrounds and experiences as a result,” she added.

Vitosh said, “[Rural areas] share a purpose to raise children to continue the community and educate future leaders of the area. There is a lot of satisfaction in continuing to know former students, hear from them, and see them succeed in the community.”

Lincoln High School math teacher Amber Vlasnik has been showing others the beauty in mathematics since she was a student in high school.

Early on, she became the one her peers went to for help. She realized that if she could find more than one way to solve a problem, she was more likely to be able to explain the process.

“Math became more about making sense than just finding the right answer,” the Lincoln native said. “It was at this time, I realized that being a math teacher could be the perfect blend of my strengths and passions.”

In 2011, Vlasnik got the chance to fulfill her passion by helping struggling students gain confidence in math in a brand-new position as a math interventionist for Lincoln Public Schools. Three high schools in LPS were chosen to pioneer a program funded by the High School Graduation Initiative grant. Vlasnik helped create the program at Lincoln High, an urban school in downtown Lincoln.

As a math interventionist, she worked with students in a one-to-one ratio or in small groups, overcoming any barriers in already busy schedules, and tailoring the learning experience to the students’ specific needs. Vlasnik said she liked seeing the change in students’ attitudes toward math and the resulting improvements, such as grades that improved on average by a full letter.

During this time, Vlasnik graduated with a Master of Arts for Teachers degree from UNL and was selected as a Noyce MTF.



LINDSAY AUGUSTYN | UNL CSMCE

Amber Vlasnik has led the math department at Lincoln High since 2015.

After three years, Vlasnik became the math department chair and began teaching Advanced Algebra Differentiated and math for English Language Learners, allowing for another opportunity to employ her skills helping others.

The ELL math class is designed to help students gain skills to be better equipped in learning Algebra. At Lincoln High, she works with diverse populations, some of which are Lincoln’s large refugee groups, namely from Iraq and Myanmar (see page 33).

“An increasing number of our students have little to no formal schooling when they come to the United States,” Vlasnik said. “This means that they may not even know what numbers mean, let alone be able to perform basic operations with those numbers.”

Making sure these students are prepared and equipped with the information they need for college is quite an undertaking, Vlasnik said. However, through her involvement with NebraskaMATH, NMSSI and NebraskaNOYCE, Vlasnik feels as though she has a multiplicity

of ideas and wealth of information from which to draw, and by which to solve each unique problem or intervene in each situation.

One of her challenges as department chair is how to bridge the gap between

school and family. Coordinating with community organizations like Lighthouse and The HUB helps connect Lincoln High students and their teachers with parents, families and support systems to have an open line of communication and bring all involved into the educational process.

Vlasnik works with 17 department members and is the liaison between the department, school administration and the district office. In addition she serves on test writing committees and leads staff development sessions. In April 2016, Vlasnik was the recipient of the Miss Myrtle Clark Outstanding Mathematics Educator Award from the LPS Foundation.

The current NATM treasurer said she views the connections that she has made through Noyce as a “priceless resource.”

“The world needs people who can think mathematically and problem solve, and the math classroom is our opportunity to hone these skills,” Vlasnik said. ●

# Urban Environments

**TRAUMA** Many students in high-need areas are coming from very fluid and some quite traumatic environments. At Culler Middle School in Lincoln, we have students constantly moving in and out of school depending on their living situation. Some students change schools many times through elementary and middle school and so the learning gap can be substantial for our incoming sixth-graders. It is so difficult to present curriculum that builds from lesson to lesson and provide re-learning opportunities for students who need it due to lack of stability outside of school.



Anne Schmidt

**TRUST** Many students have not been able to trust adults from early parts of their lives. Parents may lack the skills to provide a nurturing learning environment due to mental illness, economic issues or the willingness to develop priorities that put educational goals high on the list. Children may be shuttled from one adult to another on a moment's notice. Trust is an essential part of a solid learning environment for students in light of the risks we ask students to take as they construct their learning of mathematics.

**SUPPORTS** In our school, we offer several different supports for students depending on their individual needs. Special needs students have access to a resource period. English Language Learners (ELL students) are in up to four ELL classes each day to help facilitate the transition from their home country to life in Lincoln. We have our three grade-level counselors to help provide emotional support, keep track of academic progress and communicate with families when needed. We have two part-time social workers who meet with some students with deeper issues. We offer academic supports such as reading and math intervention classes to diagnose and treat issues with learning.

**TIME** To affect true student learning within the confines of a seven-hour school day is a daunting task when given the realities of trauma and trust. Within the school day, student support programs will take students out of class to address basic human needs. To help our students make up some of the gaps in their learning and to keep up with their counterparts in other schools, we need to find ways for students to engage with mathematics outside of school.

- Anne Schmidt, MTF, Lincoln Public Schools

Omaha Public Schools (OPS) and Lincoln Public Schools (LPS) are the two largest school districts in Nebraska, respectively, and make up 26 percent of the students in the state. Seventy-four percent of the students in OPS are considered in poverty, compared to 41 percent of all students in the state.

The Omaha-Council Bluffs, Iowa, metro area eclipsed 900,000 people for the first time in 2015, hitting an estimated 904,421, according to the latest population figures from the U.S. Census Bureau (Cordes, 2015). With this large population comes higher crime rates. In 2015, the Omaha Police Department reported 2,331 violent crimes, with 50 of those being criminal homicides.

"Gangs and violence had a huge impact on the environment at Benson High School," said MTF Tanya Archie, who used to teach at Benson before becoming a district math coach for OPS. "It is hard to have students focus on studies when they are mourning or thinking about retaliation attempts. We also had students who were in foster homes and group homes due to their parents being drug-dependent. Lots of time was spent on life skills and building relationships, so very often pacing guides and content had to be shifted and re-prioritized to make up for loss of instruction."

OPS students are bused from all over the community to the high school of their choice. Lauren Beitel, a TF who teaches at Bryan High School, said she had a student whose brother was shot and killed by his bus stop. Omaha Central's Molly Jensen, a TF, experienced having a student get in a fight after school outside of the school building, and he fell backward after being punched and died from the

fall. She also has students who wear buttons on their clothing to represent family members or friends who have died in gang violence.

Besides the daunting issues of poverty, gangs, violence and drugs, students in urban areas are often dealing with cultural differences, their parents being deported, parents who do not speak English, being parents themselves and thoughts of suicide.

Archie often sees students taking on the role of parenting their younger siblings, such as picking them up from school, feeding them supper and putting them to bed at night, which forces teachers to make sure these students are always on task during class because it is hard for them to get homework done. "Those students have a family priority that far outweighs their student priorities," Archie said.

At Bryan High, the student population is 70 percent Hispanic and many are first- or second-generation immigrants to the U.S., Beitel said. "Because their parents don't speak English, it is difficult to engage the parents in what is going on at the school.

"I've learned how vital parent involvement is in the success of each student, and when there is a language disconnect with the parents, it is hard to cultivate that involvement," Beitel added.

For Brianna Pinquoch, a TF at Central High, drawing pictures and diagrams has helped to bridge the gap when she has students whose first language is not English. However, there are often disconnects when students come from very dissimilar backgrounds.

"Students respond well when you can introduce them to areas in which the math they learn is helpful in real life," Pinquoch said.

Nebraska's Largest School District Data			
	OPS	LPS	State
Total number of students	51,928	39,842	353,934
Students who receive free or reduced lunch	38,581	16,818	143,608
Percentage of students in poverty	74	42	41
Percentage of non-white students	71	33	31
Student mobility percentage	17*	13*	12*
Average years of teacher experience	11.56*	14.22*	14.34*

\*Data from 2014-2015 State Report Card; all other data are 2015-2016 data reported to the state and last updated 11/24/15. Nebraska defines a student to be in poverty if he or she receives free or reduced lunch prices.

"The problem with that is that my real life is different from some of theirs. I spent much of my first year building relationships and learning what I could about the different populations within the school."

Pinquoch credits TEAC 840D: Culture and Schooling, which the TFs took from Noyce co-PI Steve Swidler and focused on issues of diversity and equity related to mathematics teaching and learning, with educating her on cultural sensitivity (see page 27).

Since the 1980s, refugee populations have been resettled in Lincoln and Lancaster County, and Lincoln's population has been steadily growing, recently nearing 275,000.

Lincoln High School's Amber Vlasnik, an MTF and math department chair, said an increasing number of incoming students have had little or no formal schooling.

"We are adding more and more sections of our Accelerated Math class, which is a course focused on giving students the skills they will need to move on to Algebra as quickly as possible," said Vlasnik, who previously was the math interventionist (see page 31). "Preparing students for College and Career Readiness standards in a timely manner is a huge challenge."

Having multiple Noyce

teachers at the same high-need school has especially helped the newer teachers face these challenges. Three Noyce TFs teach at Bryan (Beitel, Collin Holmquist and Jamisen Goodell), and they are mentored by MTF Katie Garcia.

"Now that we have taught here together for three years, we have shared some students and are able to find out on a case-by-case basis what works for each student," Beitel said. "Each of us has had successes in varying ways with different students and groups of students."

Holmquist has found helping students develop consistent habits has been a key to success.

"Many students struggle to find consistency in their home life and school life," Holmquist said. "Since most math builds on itself, it's tough for some students to get a good footing in math because of inconsistent habits, behaviors and attendance. I have seen students drastically change from the beginning of the semester to the end of it, both for better and for worse. While most of the reasons may be due to events outside of school, they directly affect their performance inside it. I think that is why poverty is so difficult to combat. You have to look at all facets of life and see how everything is interconnected." ●

# Developing Partnerships

Laura Janssen wants her seventh-graders to think deeply about simple things they normally take for granted. Her students are adding integers, and Janssen has them close their workbooks. She passes out colored plastic chips. *If these chips represent integers, what does it look like to add integers? Can you develop your own procedure for adding? When we return to the workbook, which method will you choose to solve the problems?*



Laura Janssen

Janssen is in her fourth year as a middle school teacher, and this is the first year she has been able to integrate problem

solving into her classroom, thanks in part to her school district's decision to dedicate 90 minutes per day to math. Part of Janssen's confidence comes from her close collaboration with two mathematicians: her husband, Mike Janssen, and his colleague, Tom Clark, both of whom she met eight years ago at UNL. Laura Janssen was an undergraduate math major. Her husband and Clark, both graduate students in mathematics, shared an office.

While at UNL, Laura Janssen and Clark both got involved in the Lincoln Math Teachers' Circle, a professional development community for teachers and university educators. Clark decided he wanted to start an MTC wherever he ended up after graduation.

Meanwhile, Laura Janssen

graduated with a bachelor's degree, and went on to get a master's and a teaching credential through NebraskaNOYCE in cohort 1. She started out teaching at a LPS middle school in a low-income area. Many of the students were eating all three meals at school every day. Math wasn't a priority.

The school, however, had a strong extracurricular program: A Boys and Girls Club that worked with teachers to provide after-school programming and homework help. With the support of the Boys and Girls Club, and with a generous supply of snacks and juice, Janssen thought she might be able to interest students in an after-school math club.

She told Clark about the idea. With permission from UNL, Clark decided to help out.

"The math club was very successful," Janssen said. "It was where I was able to start implementing things I learned from Noyce. I could do interesting problems, like finding the border you get when you line  $n$  hexagons up next to each other."

Janssen said it was also a good experience for her students to be around a mathematician like Clark and see him as a person who was funny and made addition errors, too.

Now, Janssen teaches in South Sioux City, a town on the Iowa border on the northeastern edge of Nebraska. About 50 miles away, her husband teaches at Dordt College in Sioux Center, Iowa.

This middle school, like her first one, serves a large number of first- and second-generation Latino immigrants. Now, however, Janssen

has the luxury of 90-minute class periods. "I have time to do some deep conceptual things, and then build on to the procedural, all in the same day," she says. (For instance, using integer chips to explore what addition looks like!)

Janssen frequently consults her husband when planning her classes. "There are so many times when I go to Mike with a question about mathematics, like, 'I want to teach something conceptual, is this a good way to motivate it?' And it's a two-way street. Things that are good for seventh graders instructionally are also good for college students."

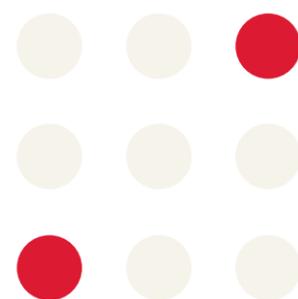
Serendipitously, Clark also ended up at Dordt College, where he teaches a mix of engineering students, math majors, and math education majors. As promised, Clark started the Northwest Iowa Math Teachers' Circle in late 2014.

Laura Janssen attends most of the meetings and helps facilitate discussion among the different tables. She said the MTC helps teachers see math with a broader perspective and provides support for teachers who want to take this more expansive view of math into their classrooms despite pressure to focus on large-scale assessments.

She also has presented about graph theory in the game of SET at a MTC session.

"As a math teacher, I feel like I have such an advantage having this community of mathematicians," the Teaching Fellow said. "I think it would be nice to give more teachers that advantage." ●

- by Hana Silverstein, AIM MTCircular Winter/Spring 2016, reprinted and edited with permission



TRENT BALLARD | UNL CSMCE

Yvonne Lai teaches Math 808T in the summer of 2016 to Nebraska in-service teachers.

In 2014, UNL was awarded a Phase II Noyce grant, in the monitoring and evaluation track, as a research grant to study the NebraskaNOYCE participants.

This grant, a three-year, \$299,878 endeavor, is led by Wendy Smith as principal investigator, with Yvonne Lai and Lorraine Males of UNL as the co-PIs.

The overarching agenda of NebraskaNOYCE Phase II is to examine the longitudinal impact of NebraskaNOYCE on recruitment and retention of MTFs and TFs and the development of their professional practice. The proposed activities investigate how resources developed through

# Looking Ahead: Phase II

the NebraskaNOYCE program contributed to MTFs' and TFs' work as professionals in high-need school districts, their commitment to the teaching profession, their development as intellectual leaders in their districts and their commitment to teaching in a high-need school district.

Phase II's goals are to understand the factors and resources that shaped the TFs' capacity for and commitment to teaching mathematics in a high-need district; the MTFs' development as master teachers and their capacity for and commitment to teaching mathematics in their high-need district; and the interactions between the MTFs and TFs that influenced these factors and resources. The project focuses on the impact of personal, social and knowledge resources and factors on MTFs' and TFs' professional practice.

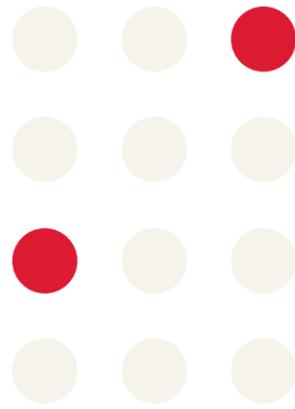
Additionally, Phase II evaluates the program's ability to recruit and retain teachers, the impact of the program on UNL's Department of Mathematics and Department of Teaching, Learning, and Teacher Education, and the impact of the program on the school districts.

A cornerstone of the research efforts involves understanding what mathematical knowledge for teaching looks like in action. MTFs and TFs have been asked to plan specific lessons, be observed teaching, and asked to reflect upon the lessons. Semi-structured interviews helped

to uncover the mathematical knowledge for teaching invoked in these instantiations of teaching. Through a deeper understanding of how MTFs and TFs plan lessons, Phase II gains insight into how teachers interpret curriculum materials, what teachers attend to in planning lessons for students, and the ways teachers use their mathematical knowledge for teaching to make decisions when planning lessons.

By observing teachers, researchers see the connections between the intended curricula (planned lessons) and enacted curricula (what actually happens in the classroom). This helps to advance the field of mathematics education research, particularly understanding teacher decision-making and supporting teachers in making purposeful designs.

Along with the research into how Noyce teachers plan and enact lessons, the grant has been focusing on the habits of mind of a mathematical thinker, and how these habits of mind influence the choices of mathematical tasks in graduate courses for teachers. Interviews have found that mathematicians lack confidence in their ability to enact habits of mind tasks with teachers. With MTFs and TFs serving on instructional teams with mathematicians for professional development courses for in-service teachers, this provides an avenue for mathematicians to learn from master teachers about connecting the mathematics to students. ●



# Building a Community



DISTRICT TEACHING AT IN 2015-16  
SCHOOL | YEAR JOINED NOYCE

## Shelby Aaberg

SCOTTSBLUFF PUBLIC SCHOOLS  
SCOTTSBLUFF HIGH | MTF 2011

I have learned and grown tremendously as a professional mathematics educator through the Noyce Master Teaching Fellows community. The program accelerated my growth as a mathematics teacher through the freedom to use professional days to observe and network with other Noyce MTFs across Nebraska. Every time I meet with these outstanding educators I learn something about how to be a better mathematics educator. There are teachers of all disciplines doing extraordinary, fantastic things to better students' life trajectories every single day. The Noyce MTFs are truly a

professional family to me. They provide me with inspiration and motivation to be the best teacher I can be for my students.

## Delise Andrews

LINCOLN PUBLIC SCHOOLS  
DISTRICT COACH | MTF 2011

My experiences with Math in the Middle and Noyce have worked to reshape my beliefs about teaching and learning mathematics. I now see the elegance and connectedness in the language of mathematics. My renewed perspective as a learner of mathematics has helped me to understand that students need opportunities to interact with, reason about and discuss mathematical ideas. I am convinced that every student can learn, understand and apply mathematical concepts. I believe strongly that the role of a teacher is to create

opportunities for learning to happen and then carefully foster students' understanding. The Noyce fellowship has given me opportunities to share my own mathematical learning journey with many other teachers in my district and state.

## Tanya Archie

OMAHA PUBLIC SCHOOLS  
DISTRICT COACH | MTF 2011

I have always had a very good relationship with students, and even before becoming a MTF, I had many leadership roles, but I wasn't quite sure what to do with those roles. My tool belt was based on my own experiences, and I was not equipped with professional support when addressing needs as a leader. I transitioned into a secondary math coach role mid-year of 2013. My experiences through this program have given me a well-equipped tool belt that

1 Gary Furse (back row, fourth from left) is in the Lincoln Ukelele Group, affectionately known as the LUG Nuts.

2 Jeremy Jank and Jamisen Goodell competed together in tennis at the 2014 Nebraska State Games.

3 Brianna Pinquoch enjoys hiking in Alaska.

4 Martial-arts enthusiast Paula Jakopovic earns her third-degree black belt.

5 Phil LaFleur and his wife, Kelly, both completed Math in the Middle and teach at Lewis and Clark Middle School in Omaha.

6 Danielle Buhrman sings at a concert in April 2015 at the Grand Theatre in Grand Island, Nebraska.

I am able to use with teachers who are all in different places in their careers and with very different challenges. I continue to lead professional development sessions throughout the district to principals, teachers and other district leaders at both the elementary and secondary levels. I would say that the Noyce program polished the skills that I already had and have made my experiences and others' experiences with me just that much better.

## Cindy Beaman

GRAND ISLAND PUBLIC SCHOOLS  
DISTRICT COACH | MTF 2013

As the only elementary math curriculum specialist in my district, I have tried to develop leadership capacity in the area of mathematics at the elementary level. I have led the elementary math task force, and I have

been instrumental in helping my district develop professional learning for elementary teachers in the area of mathematics. While this district's focus is shifting to the area of reading, I will do my best to keep mathematics instruction in our discussions and will look for opportunities for elementary teachers that will improve math instruction.

## Lauren Beitel

OMAHA PUBLIC SCHOOLS  
BRYAN HIGH | TF 2012

I am lucky to have two Noyce Teaching Fellows and one Master Teaching Fellow as co-workers in my math department at my school. We are able to collaborate and push one another to become better teachers. Because of our common background with Noyce, we are often working together and discussing how to improve the math education at our school.

I enjoy having conversations about teaching with other Noyce participants at conferences and district meetings. The Noyce program prepared us to be in these schools with the attitude that good instruction can make a difference. I underestimated all the challenges a high-need school would bring, but this experience has helped me grow in so many ways as a teacher.

## Darla Berks, Ed.D.

LINCOLN PUBLIC SCHOOLS  
DISTRICT COACH | MTF 2011

The Noyce community has given me a group of experts that I can turn to for needed advice, suggestions and brainstorming. The Noyce MTFs who are in my building have been a frequent support for me. We meet on a regular basis to discuss the direction of the math department and have planned professional development to keep



Katie Garcia and her husband are trying to see a Major League Baseball game at each of the 30 ballparks - they've been to 25!



Jill Edgren enjoys playing the piano and singing.



Sonja Ann Kalkwarf and her husband, Trevor.



Amber Vlasnik and her family visit Roca Scary Farm in Roca, Nebraska, for Halloween in 2015.



Jill Luschen is a clogger with the Foggy Mountain Cloggers in Iowa.



Jason Vitosh and his family love to travel from Falls City, Nebraska, to Kansas City, Missouri, for Royals MLB games.

the teachers moving forward. Delise Andrews and I have presented together at a conference about "Principles to Actions." We also have turned to other MTFs for input as we work with our department.

### Danielle Buhrman

GRAND ISLAND PUBLIC SCHOOLS  
GRAND ISLAND SENIOR HIGH | MTF 2011

I was 24 years old when I was selected for this program. I was the youngest in my department and in the MTF group. Compared to others, I had minimal accomplishments, but I was selected because of the potential impact I could have on the profession. They took a chance on me. I had potential as a teacher leader but I was still learning about who I was as a teacher and how to interact with colleagues who had a lot more experience than me. Throughout the course of the past five years, I gained confidence more than anything: confidence to express my ideas about the teaching and learning of mathematics, confidence to speak up when I felt we as a district weren't doing what was best for students, confidence to listen to and provide suggestions to colleagues and administrators, and confidence to disagree and

work with central office personnel on the direction of mathematics education in our district. Because of these conversations, my passion for our students, and constant regard for student learning and overall well-being, my district now turns to me for ideas, suggestions and recommendations. Noyce tapped into my potential to be a teacher leader and gave me opportunities to flourish. I had a voice that could and needed to be heard, and I am forever grateful that they helped me realize the impact I could have on students, teachers and our district as a whole.

### Connie Colton

OMAHA PUBLIC SCHOOLS  
MCMILLAN MAGNET MIDDLE | MTF 2011

Through this program, I have learned how important it is for teachers to collaborate with higher education leaders. Each member of the educational community brings a different view and expertise to the table. What this means for me personally is that when I reach an impasse in my practice, I have access to virtually unlimited resources as I seek a resolution. These resources include academic, pedagogical, philosophical and emotional support. Prior to joining the

NebraskaMATH programs offered by UNL, I felt isolated in my classroom; this program has permanently eliminated that powerless, lonely feeling. The Noyce Master Teaching Fellowship program has provided a permanent support system for me as both an educator and a lifelong learner. The impact of the Noyce program also reaches beyond Nebraska, as I am now teaching both math content and pedagogy courses for pre-service teachers at Buena Vista University (BVU) in Iowa. Several of the teachers completed their degree through BVU and secured OPS positions.

### Alicia Davis

LINCOLN PUBLIC SCHOOLS  
SCOTT MIDDLE | MTF 2011

The Noyce community has provided me with a group of colleagues that share my same passion and drive to help all students grow as mathematicians and as people. I am in weekly communication with members of this community and they will continue to be some of my most respected colleagues and closest friends. I am a teacher leader because of my unwavering pursuit of excellence. Far too many of my students have people in their lives that have given up on them - in

large and small ways. I refuse to be one of them. I work relentlessly to help my students meet high academic and personal standards.

### Jill Edgren

WOOD RIVER RURAL SCHOOL | MTF 2011

Two main impacts of NebraskaNOYCE include becoming a more responsive teacher and joining Twitter. As a result of becoming a more responsive teacher in a high-need district, I have made connections with students, including students who have never been in my classes. This change was noticed, and I was invited to be a part of the principal's teacher advisory team. #Noycechat (see page 23) was the beginning of Twitter for me and brought so many transformative ideas to my screen and processed in my mathematical learning and teaching.

### Sarah Fischbein

LINCOLN PUBLIC SCHOOLS  
GOODRICH MIDDLE | TF 2011

I have been so lucky to have such a close-knit family in the Noyce program. I have relied on my Noyce counterparts throughout my years of teaching. We try to get together at least once a year in person to discuss how our year

is going and talk about new and exciting things we have done. We also have relied on each other over the years for materials or ideas. If I had never joined the Noyce program, I wouldn't have these wonderful people that I consider family cheering me on throughout my career and helping me when I get stuck. For me, this family has been one of the most valuable things I've gotten from Noyce - a community of teachers who care and uplift one another.

### Gary Furse

LINCOLN PUBLIC SCHOOLS  
POUND MIDDLE | MTF 2011

Teachers don't teach within communities as much as they teach next to one another. Each is isolated in a classroom without another adult and charged with teaching students how to study, how to behave, how to communicate and how to master the objectives and skills of the lessons. Potentially during plan time, teachers get to talk about what we have learned about how to teach. Usually plan-time discussions are about the specifics of what incidences derailed the instruction train and/or which students understand the lessons; more often, it's about which students disrupted the class.

Usually we share what we taught, what worked and what we are going to teach. This Noyce cohort has given me the opportunity to discuss mathematic pedagogy. We don't share the same students, the same district objectives or the same demographics, but we can talk about the specifics of how to teach. We share our own perspectives and our own methods of delivery. We share what we learned from reading such authors as Carol Dweck and Jo Boaler. We share what we learned from different conferences and webinars. We share how to be a teacher.

### Katie Garcia

OMAHA PUBLIC SCHOOLS  
BRYAN HIGH | MTF 2011

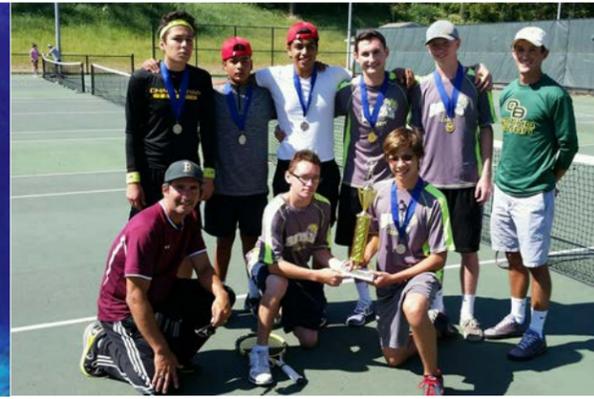
I have learned that I am more capable than I give myself credit for. I have learned that I am not alone in my struggles, challenges and triumphs. I have learned that there is tremendous capacity for support within a community of dedicated people. I have learned that it is my responsibility to advocate for quality math education for my students not only in my own classroom and my own school, but also in the community and beyond. I have learned that educators are dedicated, passionate



Shelby Aaberg and the Scottsbluff Math Bowl team won first place in Class II at UNL's 2015 Math Day.



Sarah Fischbein (top right) goes scuba diving, one of her favorite hobbies, in the Grand Caymans in March 2015.



Jamisen Goodell (right) is an assistant coach of the boys' varsity tennis team at Omaha Bryan High School.



Joseph Steele suggests a strategy during Chess Club at Omaha Northwest High.



Lauren Beitel, Jamisen Goodell and Collin Holmquist take a picture together at UNL graduation in 2013.

people – teachers just needs to seek out and surround themselves with the right people.

### Jamisen Goodell

OMAHA PUBLIC SCHOOLS  
BRYAN HIGH | TF 2012

I feel like I have gained access to the collective knowledge of my Noyce colleagues for lesson planning, classroom management and activities. I also gained a passion for teaching and improving as a teacher. Many of the Noyce teachers are striving to improve their teaching and do not accept anything as 'good enough.' Noyce teachers are constantly working to improve themselves as teachers to bring the best learning experience to their students. That sort of mentality rubs off on others among the Noyce community and among the teachers we interact with at our respective schools.

### Alan Holdorf

LINCOLN PUBLIC SCHOOLS  
LINCOLN SOUTHEAST | TF 2011

Being a part of the Noyce community has helped me gain a foothold in several other communities throughout the profession. When I have joined in new communities, such as Math Teachers' Circle events or

statewide organizations, I have had familiar faces each time thanks to my inclusion in the Noyce community. The members of this community are so widespread throughout the profession in Nebraska that I have been able to make helpful connections across the state.

### Collin Holmquist

OMAHA PUBLIC SCHOOLS  
BRYAN HIGH | TF 2012

I am so grateful that this program led me to teach at Omaha Bryan. The Noyce program prepared me for this by providing insight into an entire year of student teaching. Having a full year of student teaching gave me a head-start to my teaching career. It also helped me develop stronger positive relationships with students and be a more responsive teacher. While every school and student has specific needs, the needs derived from poverty are more far reaching than I realized. The Noyce courses provided thought-provoking questions and in-depth discussion. All of this culminates in my ability to be aware of the issues surrounding the educational system and to think deeply and act responsively with the confidence that the knowledge I have will better the environment around me.

### Paula Jakopovic

OMAHA PUBLIC SCHOOLS  
FIELD CLUB ELEMENTARY | MTF 2011

Going through the Noyce coursework as a cohort allowed me the chance to really get to know the other Master Teaching Fellows. As the only elementary school teacher from Omaha who participated in the original coursework, I gained so many new connections to which I could reach out for advice and support. As I began my journey in the new role of math coach, I was able to connect with Delise Andrews and Anne Schmidt, who are math coaches for Lincoln Public Schools, and ask them for ideas and advice in how I might go about enacting this new role within my own district. I also got to know middle and high school teachers in my own district as well as others, and I have reached out to different members of our cohort on a variety of occasions to ask for advice, expertise and a secondary perspective on a variety of issues. I have gained a deep appreciation for these amazing teachers and the expertise we have here in the state of Nebraska. These Noyce teachers are faces I look forward to seeing at conferences and events around the state and the region.

### Patrick Janike

LINCOLN PUBLIC SCHOOLS  
LINCOLN HIGH | MTF 2011

The Noyce community has given me an opportunity to both have a voice in and listen to conversations about mathematics education, including topics around how to improve student achievement, how to help colleagues and pre-professionals, and how to make better decisions regarding school leadership. Being selected to be a part of such a dedicated group of teachers challenged me to step up my efforts as an educator, take opportunities to lead within my district and further my education as it pertains to my profession.

### Jeremy Jank

LINCOLN PUBLIC SCHOOLS  
LINCOLN NORTH STAR | TF 2012

I try to relay to my students on a consistent basis that no matter the circumstances they come from or their prior experience with mathematics, they now are given an opportunity to take advantage of the academics in front of them. Building relationships with my students, holding them accountable, and focusing on the positives in their character and work is of utmost importance

to me. The message that I want students to continually hear is to do what is right, which includes treating brothers, sisters, parents, teachers, friends and other family members well, as well as taking responsibility for their education by consistently putting in the time and effort to achieve at their highest potential.

### Laura Janssen

SOUTH SIOUX CITY COMM. SCHOOLS  
SOUTH SIOUX CITY MIDDLE | TF 2011

We have all been through a rigorous teacher preparation program focused on mathematics, and I've always found my cohort to be a place to turn for expertise on how to teach different concepts. Since we all teach in high-need schools, we can offer one another strategies to engage and motivate students. Most of all, my Noyce colleagues have been a source of encouragement – encouragement to keep trying new things, to keep pushing kids to think deeply and to keep getting better.

### Molly Jensen

OMAHA PUBLIC SCHOOLS  
CENTRAL HIGH | TF 2011

There are 21 math teachers at the urban high school at

which I teach. Since the staff is so large, I take pride in how well I get along and interact with all of my colleagues. I try to keep a positive and upbeat demeanor at all times. I want the staff to feed off my energy and, hopefully, it encourages them to act the same way. I create a lot of fun material for my students to work on: games, puzzles, whiteboard races and projects. I share as much of my material as possible. I talk about what I'm doing in class and offer suggestions when other teachers are looking for ideas.

### Sonja Ann Kalkwarf

CEDAR BLUFFS SCHOOL | TF 2012

As a Noyce member, I have been able to offer a wider variety of courses at my high-need school. Due to my highly qualified status and extensive graduate math coursework, I have been able to expand the dual-credit offerings at my school. I have taken over the role of math curriculum specialist/math department chair, and I help make the major decisions about textbooks and other curriculum that the middle school and high school use. All of this has been done to ensure that our students are prepared for the next phase of their lives.

**Susie Katt**

LINCOLN PUBLIC SCHOOLS  
DISTRICT COACH | MTF 2012

I have enjoyed collaborating with other MTFs who represent a wide range of grade levels and those who work outside of my district, expanding upon my professional learning network. This has also allowed me to gain a better perspective of math education across K-12, the state of Nebraska and beyond. The Nebraska MTFs have unique gifts to share, and I have been very fortunate to get to learn from those whom I have had the opportunity to meet during the past four years. The time spent with other math educators from the Noyce community is something for which I'll be forever grateful.

**Kesha King**

OMAHA PUBLIC SCHOOLS  
CHANDLER VIEW ELEMENTARY | MTF 2013

Belonging to this Noyce community has motivated me to be more ambitious and committed to my profession. I will embark on a degree in educational administration beginning this summer. This is an endeavor that I would have postponed indefinitely, but participants in my Noyce community are so inspirational. I feel driven to achieve as they share their achievements.

**Phil LaFleur**

OMAHA PUBLIC SCHOOLS  
LEWIS AND CLARK MIDDLE | MTF 2011

Working with outstanding teachers from across the state exposed me to different ways of teaching beyond my education and district peers. Every time that we come together as a group, I leave with another idea that I take

back to my classroom. Finally, I have a better understanding of where my students are going, and the background knowledge that they need. The classes that we took as a group went well beyond the level of mathematics that I had taken previously. The MTFs helped me through the content that I had not been exposed to, as well as showed me how it connects to what I teach in the middle school.

**Brent Larson**

OMAHA PUBLIC SCHOOLS  
CENTRAL HIGH | MTF 2011

For a long time I have been comfortable teaching a variety of classes, but the Noyce community has given me a sounding board to bounce ideas off of and resources to revisit my practice and see it through multiple lenses. I feel that the Noyce community has helped me take my practice to a new level. The way I question my kids, the way I assess my students, the way I build lessons and units, and the way I watch others in the profession have all been impacted by my peers in the Noyce community.

**Jill Luschen**

OMAHA PUBLIC SCHOOLS  
ALICE BUFFETT MAGNET MIDDLE | MTF 2011

When I joined the Noyce community, it was like being reunited with a long-lost family; it is refreshing to be with like-minded peers. I have learned more from my fellows than I have ever learned in any college class, and their patience with me when they had to explain themselves multiple times also showed their phenomenal ability as teachers of math. From my community, I have gained confidence in my content

knowledge as well as confidence in being a leader in my building and a mentor to teachers across the district. This was an experience that truly changed my teaching and my impact on students for the rest of my career.

**Josh Males**

LINCOLN PUBLIC SCHOOLS  
DISTRICT OFFICE | MTF 2013

I became a Noyce MTF right after I became the department chair at Lincoln Northeast. I'm now a secondary math coordinator at the district level. This has given me the opportunity to have a big picture view and to help teachers in all of the high schools improve their instruction. Teaching other teachers forces me to clarify in my own mind my expectations for my students. I want to create experiences for my peers to stretch their thinking and understanding of both mathematical content and pedagogy. Seeing colleagues struggle with ideas and content is very much like looking in a mirror and helps me to see the process that I've been through as a teacher and the same process that I want the students in my classroom to go through.

**Brianna Pinguoch**

OMAHA PUBLIC SCHOOLS  
CENTRAL HIGH | TF 2011

I contribute the majority of my dedication to professional development and self-improvement to the Noyce program. I am surrounded by people who encourage me to learn and teach more – and better. I have learned so much from attending conferences, taking and teaching graduate classes and collaborating with peers. I frequently get to converse with others about profound

ideas related to mathematics and pedagogy. I have found that collaboration is valuable in the education profession. I feel comfortable asking for input from the other TFs, the MTFs and the principal investigators.

**Edie Ronhovde**

FREMONT PUBLIC SCHOOLS  
FREMONT MIDDLE | MTF 2011

I am constantly looking for ways to help our department be better at what we do. I make myself accessible to anyone that has questions. I work very hard with the parents of my students to make sure that they know what they can do to help their child be successful. I share with parents regularly both good and bad happenings so that we can both see the success taking place in the classroom. This Noyce community is a support system for me when I am trying to make a change in the way things have been done in the past and I meet resistance.

**Greg Sand**

OMAHA PUBLIC SCHOOLS  
CENTRAL HIGH | MTF 2011

The Noyce community is made up of a group of teachers from diverse professional backgrounds as well as the unique communities that they serve. I have realized that there are many teachers who are struggling with the same issues I am, so I have found myself serving as both a supporter of my peers as well as being supported by them. Additionally, I have had the opportunity to grow in my understanding of the challenges faced by teachers outside of the Omaha/Lincoln areas. It is extremely easy to become isolated within my own districts' issues when in reality, everyone is fighting similar battles. My own

teaching has become much better from having the opportunity to listen to and work with this group.

**Dan Schaben**

ARAPAHOE PUBLIC SCHOOL | MTF 2011  
*See page 46*

**Anne Schmidt**

LINCOLN PUBLIC SCHOOLS  
CULLER MIDDLE | MTF 2011

With inspiration from my colleagues, I am constantly trying to find ways to illustrate for other educators different perspectives to use when planning lessons that engage students in new ways. The cornerstone of my teaching has been based on collaboration. I have a strong belief any teaching situation can be enhanced when thoughtful planning is done in a positive collaborative session. My focus at Culler Middle School has been based on building strong relationships with teams to help them communicate more effectively with one another. At my urging, the administration has supported common plan times for teaching teams as well as training in Cooperative Learning for use in all math classrooms as well as staff throughout the building. Extended collaborative practice to students allows for math talk and self-assessment of the task at hand.

**Katie Soto**

GRAND ISLAND PUBLIC SCHOOLS  
WESTRIDGE MIDDLE | MTF 2011

It has been an honor to be a part of the Noyce community. I enjoyed the summer courses we all took together. The collaboration was excellent, and I learned so much from my bright colleagues. I also had the privilege of sharing a classroom one year with a fellow

Noyce scholar. I got to observe excellent teaching each and every day, and learned so much from that experience. I have been able to continue the collaborative efforts and communication even after moving outside of Lincoln, mostly through email. It is a blessing to have the support of such bright, innovative teachers.

**Patrick Spieler**

OMAHA PUBLIC SCHOOLS  
CENTRAL HIGH | TF 2012

I wanted to be a part of the Noyce program because I wanted to make a difference in the lives of young people. I believe that all my students have the ability to learn math, and I try to help them build their confidence and belief in themselves. This starts with developing relationships with them and building their trust. Students leave my class with a better understanding of math and a greater belief that they can persevere and overcome any challenge they face.

**Joseph Steele, Ph.D.**

OMAHA PUBLIC SCHOOLS  
NORTHWEST MAGNET HIGH | TF 2012

The most important experience has been the way that it modeled the encouragement of student collaboration and group work. I have had a great deal of schooling, and I have usually worked alone in those classes. But, in my Noyce classes, we were organized into a cohort and encouraged to work together in every class and in various ways. I participated in more group work than I ever have before, and I benefited from it more than I would have ever guessed. It's a mindset and a teaching technique that I carry into every classroom.

## MY JOURNEY WITH CANCER

**M**y cancer journey began in February 2013 and continues today. Leiomyosarcoma is rare. My doctors from Superior and Hastings, Nebraska, and the Cancer Treatment Centers of America in Chicago have been wonderful. In meeting new doctors, when they find out I am a math teacher, their faces light up, and they smile and say, “I love math!” They have enormous respect for educators.

In many ways, this journey has been a blessing. I’ve had great experiences that have allowed me to meet so many amazing people. I have had the opportunity to prioritize and strengthen relationships. Finding out how supportive people can be is very humbling. The day a beautiful

quilt from my UNL and Noyce friends was presented to me during a blizzard at the Lincoln airport is a day I cherish.

Cancer also has helped me to become more tech-savvy. I have undergone surgeries, radiation and chemotherapy. By using the video feature on Google+, I was able to teach my students from Chicago during the radiation portion of my treatment.

Although I have not completed all of the Noyce leadership activities I envisioned, I have found great joy in observing and cheering on other Noyce



Jessica Thompson uses Google+ with a teacher across the hall to practice teaching remotely.

members as they have reached amazing landmarks. Their achievements are inspiring.

Thankfully, I have had the best-behaved students and the finest substitute. I am striving to offer them the kindness and grace they have consistently shown me.

- Jessica Thompson

### ← CONT. Jessica Thompson

SUPERIOR PUBLIC SCHOOLS  
SUPERIOR JR/SR HIGH | MTF 2011

**T**his Noyce community has taught me it’s possible to stretch a teacher’s circle of influence far beyond her district and state. My peers have shown me, by their actions, that reaching out to other math educators across the nation, and the globe, can improve student learning. By taking the geographical boundaries away, I have learned the importance of reaching out to others, to those who are driven to improve.

### Matthew Timm

OMAHA PUBLIC SCHOOLS  
DISTRICT COACH | MTF 2013

**B**eing a Noyce MTF has created opportunities for me to

make connections with teachers throughout the state, in particular, my district, that otherwise I would never make. Working in Omaha, this has helped me gain perspective on teaching math in smaller communities, and more importantly I have been able to develop a K-12 perspective on teaching and learning mathematics. Both in graduate courses and at conferences, I have been able to have enriching conversations with these colleagues, and I have co-taught a class with approximately 10 MTFs. I have learned a great deal from watching and working side by side with each of them.

### Jason Vitosh

FALLS CITY PUBLIC SCHOOLS  
FALLS CITY HIGH | MTF 2011

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### Amber Vlasnik

LINCOLN PUBLIC SCHOOLS  
LINCOLN HIGH | MTF 2012

**I** have had the privilege of being part of several NebraskaMATH communities. I participated in the New Teacher Network, Nebraska Algebra and completed my master’s degree at UNL through the Nebraska Math and Science Summer Institutes. I have gained so much from each of these communities, but have personally benefited the most from the Noyce community. I joined the community late, but this group of professionals is welcoming and uplifting. I am challenged every day to provide the highest quality instruction to my students, and I feel like the network of teachers I have found in Noyce has provided the support I need to do that.

### Jerel Welker

LINCOLN PUBLIC SCHOOLS  
DISTRICT OFFICE | MTF 2013

**T**hrough the years that the Noyce project has been in place, I have transitioned from teacher to mathematics coach and coordinator. This journey demonstrates the impact of the Noyce program and how others view my leadership skills. The courses I have taken and taught have further developed my skills, particularly related to assessment development and analysis of assessment data. The use of technology in the classroom has been a focus. GeoGebra is one of my favorite tools, as it can be used to make mathematics visual and provide help in solving problems. Through Noyce, I have connected with others as a colleague who can assist in building online tools. Working with teachers, I am constantly challenged to model best teaching practices.

### Sherry West

LINCOLN PUBLIC SCHOOLS  
LINCOLN SOUTHEAST | MTF 2011

**I** have been in education for more than 25 years. The Noyce MTFs have been the most inspirational teachers I have ever met. Their passion for mathematics and education combined with a desire to consistently improve and achieve more professionally is beyond any other. Some have modeled how to persevere under difficult circumstances. Others have modeled the importance of getting involved, while others have modeled using technology to improve education. Through this group I’ve gained a broader, more balanced perspective of the issues facing math education in Nebraska. This perspective helps me take a more balanced approach to changes that are suggested in my own district. ●

## References

- Ball, D. L., Hill, H.C., & Bass, H. (2005). Knowing mathematics for teaching: Who knows mathematics well enough to teach third grade, and how can we decide? *American Educator*, 29, 14-17, 20-22, 43-46.
- Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education*, 59(5), 389-407.
- Conference Board of Mathematical Sciences. (2001). *The mathematical education of teachers*. Washington, DC: American Mathematical Society.
- Conference Board of the Mathematical Sciences. (2012). *The Mathematical Education of Teachers II*. Providence, RI, and Washington, DC: American Mathematical Society and Mathematical Association of America.
- Cordes, H. J. (2015, March 27.) For the Omaha metro area, population milestone of 1 million is in sight. *Omaha World-Herald*. Retrieved from <http://www.omaha.com>
- Cuoco, A. (2001). Mathematics for teaching. *Notices of the AMS*, 48(2), 168-174.
- Dalgarno, N. & Colgan, L. (2007). Supporting novice elementary mathematics teachers’ induction in professional communities and providing innovative forms of pedagogical content knowledge through information and communication technology. *Teaching and Teacher Education*, 23(7), 1051-1065.
- Darling-Hammond, L., Holtzman, D., Gatlin, S.J., & Heilig, J.V. (2005). Does teacher preparation matter? Evidence about teacher certification, Teach for America, and teacher effectiveness. *Education Policy Analysis Archives*, 13(42).
- Darling-Hammond, L. (2007). Race, inequality and educational accountability: The irony of No Child Left Behind. *Race, Ethnicity and Education*, 10(3), 245-260.
- Farmer, F. L. (1997). Rural, definition of. In G. A. Goreham (Ed.), *Encyclopedia of Rural America: The Land and the People* (pp. 623-626). Santa Barbara, CA: ABC-CLIO, Inc.
- Grier, J. M., Johnston, C. C. (2008). *STEM career-changers transition to teaching: I have to become a student again*. Paper presented to the annual NARST International Conference, Baltimore, MD.
- Gschwend, L., & Moir, E. (2007). Growing together. *Journal of Staff Development*, 28(4), 20-24.
- Heaton, R. M., Smith, W. M., Kromminga, R., & Hartman, D. (2008). The ambiguity of rural. *Rural Mathematics Educator*, 7(1). Available online at <http://www.acclaim-math.org/newsletter.aspx?id=55>
- Heid, M. K. (2008). *Mathematical knowledge for secondary school mathematics teaching*. Paper presented at the International Congress on Mathematical Education, Monterrey, Mexico.
- Ingersoll, R. & Perda, D. (2010). Is the supply of mathematics and science teachers sufficient? *American Educational Research Journal*, 20(3), 1-32.
- Ingersoll, R. (2000). *Turnover among mathematics and science teachers in the U.S.* Report prepared for the National Commission on Mathematics and Science Teaching for the 21st Century. John Glenn, Chair.
- Ingersoll, R. (2012). Beginning teacher induction: What the data tell us. *Kappan*, 93(8), 47-51.
- Ingersoll, R., Merrill, L., & May, H. (2014). *What are the effects of teacher education and preparation on beginning teacher attrition?* Research Report (#RR-82). Philadelphia: Consortium for Policy Research in Education, University of Pennsylvania.
- Lortie, D. C. (2002/1975). *Schoolteacher: A sociological study*. Chicago: University of Chicago Press.
- McGinnis, J., Randy, C. P. & Graeber, A. O. (2004). A cultural perspective of the induction of five reform-minded beginning mathematics and science teachers. *Journal of Research in Science Teaching*, 41(7), 720-747.
- Morgan, M. M. & Kritsonis, W.A. (2008). A national focus: the recruitment, retention, and development of quality teachers in hard-to-staff schools. *National Journal for Publishing and Mentoring Doctoral Student Research*, 5(1), 1-7.
- National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Reston, VA: Author.
- National Council of Teachers of Mathematics. (2014). *Principles to Actions*. Reston, VA: Author.
- Silverstein, H. (2016). Two-way street: Old friendships, new collaborations. *MTCircular*, Winter/Spring, 10-12.
- Smith T. & Ingersoll, R. (2004). What are the effects of induction and mentoring on beginning teacher turnover? *American Educational Research Journal*, 41(3), 681-714.

“ All of these experiences have given me vision. After working in Noyce, I have learned that a leader is someone with deep understanding of what needs to be done and then the fortitude to carry through with it, even when no one else is moving in that direction. Noyce has given me the tools to carry out what needs to be done and shown me that my expertise in math education is too valuable to stop at my own district. Because of Noyce, my students and the students of rural Nebraska have gained a champion. They have gained a teacher who will fight to provide them with the high-quality math program every student in rural Nebraska deserves.”

Dan Schaben  
Noyce Master Teaching Fellow

# Noyce Project Leadership

## Leadership Team

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## Glossary

GIPS - Grand Island Public Schools, Nebraska

LPS - Lincoln Public Schools, Nebraska

MTF - Master Teaching Fellow

NATM - Nebraska Association of Teachers of Mathematics

NCTM - National Council of Teachers of Mathematics

NMSSI - Nebraska Math and Science Summer Institutes

OPS - Omaha Public Schools, Nebraska

PAEMST - Presidential Award for Excellence in Mathematics and Science Teaching

TF - Teaching Fellow

UNL - University of Nebraska-Lincoln

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