



HAMTE Crossroads

The Official Newsletter of the Hoosier Association of Mathematics Teacher Educators

Message from the President



Colleagues, I am so happy to feel the spring coming to campus!

I'm hoping that you have had a productive spring and are feeling the end of the semester as a positive landmark on the academic horizon. So many critical and wonderful movements and events have emerged in mathematics education this spring. I will highlight a few of the national activities and the efforts of our state organization.

National

Academic Freedom: The challenge of supporting colleagues whose academic freedom has been questioned continues as our national and regional organizations consider options for action in the face of cyber attacks. There are many resources available that discuss how members might be proactive regarding online security (e.g.,

<http://www.crashoverridenetwork.com/resources.html>). Continue to look for PopUp sessions at our national meetings as mathematics educators come together to discuss our emotional and academic reactions to these events.

AMTE Annual Meeting: Association of Mathematics Teacher Educator's annual conference provided many opportunities for HAMTE members to consider the lives and experiences of LGBTQ+ students in mathematics classes, school, and society. For more information on this, see the *AMTE Connections* Spring issue <https://amte.net/connections/2018/03/highlights-2018-annual-conference-houston-tx>. We were fortunate to be able to fund two members to attend the annual meeting. See Elizabeth Suazo's reflection on her first AMTE conference in this issue. HAMTE was well represented in Houston and we look forward to next year's conference. Please consider submitting a proposal for the 2019 AMTE Conference in Orlando! The deadline is May 15th.

State

Bill 1399: Advocacy works! We put our minds and physical energy into legislation for the creation of elementary mathematics specialists and we achieved. Thank you to Sheryl Stump, Doris Mohr, and Betsy Berry for their leadership on this important work. Also thank you to the membership who made their ideas and views regarding this bill known.

IMERS 2018: Collaboration works! HAMTE once again supported graduate education and engagement in Indiana with members serving on the conference committee and as facilitators for this event. Graduate students attending had the opportunity to share their ideas for research and receive feedback at no cost! In addition, Dana Cox of Miami University and Nicole Joseph of Vanderbilt University shared their insights and ideas about sustaining a mathematics education practice. Thank you to all members who helped ensure this event was successful!

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AMTE Mathematics Teacher Leadership Conference: Another successful event hosted by members! This year's conference built from the excitement of prior years with national speakers and breakouts to support Leaders in Elementary and Middle School Mathematics. Shannon Larsen and Jenny Jorgensen, from the University of Maine were keynote speakers. Thank you to members who continue to support this important opportunity for teacher leaders in our state.

HAMTE Constitution: Thanks to all who voted and to Andrew Hoffman who coordinated the voting process. We now have a new position on the HAMTE board: *Graduate Student Outreach Member*. Sue Ellen Richardson is currently serving in that role at my request, but our call for nominations for officers will now include the position of Graduate Student Outreach member.

Upcoming Events for HAMTE members!

HAMTE Annual Retreat: Please save the date and plan to come! We are excited to recharge and share successes, ideas, and insights on May 18th (10-3) at University of Indianapolis. We are planning some exciting activities, but are open to suggestions for this event. If there are activities you think we should plan or if you would like to participate in the planning, please email: skastber@purdue.edu. You will receive an email about this event in April!

ICTM Annual Meeting Proposals: Mathematics Teacher Educator Strand needs you! All, this year consider submitting a proposal for the ICTM annual meeting that would be of interest to teacher educators and other mathematics educators. Proposals will likely be due in August, but commit to writing up a proposal right now! Lead presenters registration is free. We want to ensure HAMTE is well represented at ICTM.

Thanks to everyone for your continued support of mathematics education. I hope this message finds you feeling that your practice is sustainable. If you have exciting stories to tell or challenges to share, please reach out and we can add your story to the next newsletter.

~Signe Kastberg~

Upcoming Events

- AERA Conference: April 13-17, New York City
- NCTM National Conference: April 23-28, Washington, D.C.
- HAMTE Retreat: May 18th from 10 A.M. – 3 P.M., Indianapolis
- TODOS: Mathematics for All Conference: June 21-23, Phoenix
- ICTM Conference: November 4-5, Indianapolis
- PME-NA 2018 Conference: November 15-18, Greenville, SC
- AMTE Conference: February 7-9, 2019, Orlando, FL

2017 HAMTE Business Meeting



Then-President Sheryl Stump (right) passes the gavel to Now-President Signe Kastberg (left).

Congratulations to **Elizabeth Suazo Flores** (see page 4) and **Lizhen Chen** for being selected as the 2017 HAMTE Travel Grant recipients to attend the 2018 AMTE conference.

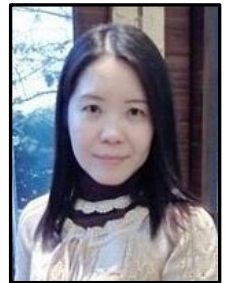
The HAMTE board would officially like to welcome new members to the organization. New members include:

Amanda Huffman, Pike High School

Angela Snyder, Creekside Middle School

Erik Jacobson, Indiana University--Bloomington

There were changes in the HAMTE board at the 2017 business meeting. **Signe Kastberg** moved from president-elect to president, and **Sheryl Stump** moved from president to past-president. **Rachael Kenney** completed her term as treasurer, and **Yi-Yan “Winne” Ko** (above) was elected as treasurer. Thank you Rachael for all your service to HAMTE!



Then-President Sheryl Stump (left) thanks Then-Treasurer Rachael Kenney (right) for her work with HAMTE.



CALL for Manuscripts!

ICTM is seeking manuscripts for their academic journal, *Indiana Mathematics Teacher*.

Visit the [ICTM website](#) and/or contact editors

Doris Mohr
(djmohr@usi.edu)
and **Sheryl Stump**
(ssstump@bsu.edu)

for more information.

Reflections from a First Time AMTE Attendee

Elizabeth Suazo Flores | Purdue University

As a first time attendee of AMTE, I was greatly surprised by the rewarding experience I had at this conference. I joined sessions related to my personal research interests, my future as an academic, and sessions that made me feel part of the mathematics education community. These different experiences where nurtured with colleagues' comments and feedback that reaffirmed my decision to be a mathematics educator. Here, I share with you some of my learning experiences at AMTE 2018.

As could happen to you, I clearly remember the first session I attended. I learned about lessons that involved social justice issues and discussed with colleagues how mathematics educators struggle implementing and promoting these types of lessons among their prospective teachers. The same day, I was lucky to join the preparation of the Pop-Up session to support mathematics educators under attack. The organizers' caring and commitment for others was an inspiring experience that I think is transforming AMTE in a place that welcomes diversity in different aspects. At the time of the Pop-Up session, the atmosphere felt therapeutic to me. We shared struggles and fears experienced, or some of us were experiencing, in our academic lives.

Sue Ellen Richardson and I also felt proud and grateful of having nominated Signe for the *AMTE Excellence in Teaching Award*. We worked on this over the summer while we were working on our dissertation studies. Our summer efforts paid us back when we saw Ralph Phillips introducing Signe at AMTE.

I was also fortunate to lead a session with my colleagues Signe Kastberg, Jennifer Ward, and Dana Cox. In this session we met new people interested in using the methodologies of self-study, auto ethnography, and narrative inquiry. People's enthusiasm for these methodologies, and comments from senior mathematics educators such as Anita Wager and Olive Chapman, confirmed my joy and commitment to the narrative inquiry methodology.

I also had the opportunity to fulfill my personal interest for statistics education. I joined a session where Rick Hudson, Christine Franklin, and

Stephanie Casey were some of the presenters. Here, I learned about statistics practices, tasks, and the CODAP software. All of these tools serve to create spaces to promote statistical habits of mind. I am looking forward to having an opportunity to use these tools with adults and K-12 learners.

I experienced AMTE as a place to unwind and reinvigorate my research and teaching of mathematics ideas. Thank you HAMTE for allowing me to be part of such a great experience!



Signe Kastberg displays her 2018 AMTE *Excellence in Teaching Award* and is accompanied by Elizabeth Suazo Flores (left) and Sue Ellen Richardson (right) her nominated her for the award.

*Signe Kastberg wins AMTE
Excellence in Teaching Award!*

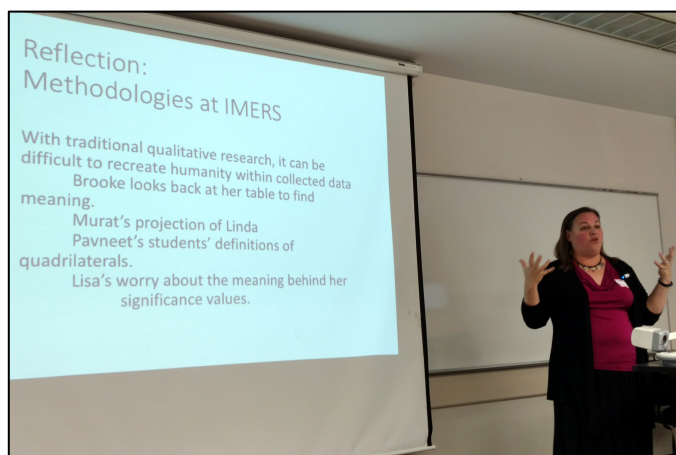
Indiana Mathematics Education Research Symposium 2018

The IMERS Planning Committee, led by Sue Ellen Richardson, is happy to announce there were eight universities represented at IMERS 2018 on March 2nd at the IUPUI School of Education in Indianapolis.

Throughout the symposium there were eleven faculty facilitators, and 24 presentations by 22 different graduate students. The 2018 symposium also included keynote presentations by Dr. Nicole Joseph Vanderbilt University (right) and Dr. Dana Cox from Miami University – Ohio (left). Dr. Joseph



presented on the “Tensions in the Career of a Black Woman Researcher in the Racialized World of Mathematics Education,” and Dr. Cox’s presentation was “Toward Understanding Research and Teaching as Empathetic Activities.”



Please email Sue Ellen Richardson, richa114@purdue.edu, if you would like to join the IMERS 2019 planning committee.

Mathematics Teacher Leadership Conference 2018

The HAMTE Elementary Mathematics Specialist (EMS) Task Force (Betsy Berry, Doris Mohr, and Sheryl Stump) hosted the third annual MTL Conference on Friday, March 9, in the Schwitzer Student Center at the University of Indianapolis. Many thanks to Travis Miller for hosting the event!

The final count of registrations included 135 K-8 teachers and leaders. Keynote speakers Shannon Larsen and Jenny Jorgensen, from the University of Maine at Farmington, presented on the topic of “Professional Learning Opportunities for Math Specialists.” The program also included breakout sessions led by Shannon and Jenny and by Nicole Caulfield and John Ulbright (MSD of Wayne Township), Ryan Flessner (Butler University) and Courtney Flessner (Indiana University), Nick Meyer and Kathy Jones (Indianapolis Public Schools), and Betsy Berry (IPFW).



Thinking Equity in Mathematics Education

Collaborative Teaching: A Break from the *Traditional*

Amanda Huffman | Pike High School, Indianapolis
Meredith Varner | Butler University

Far too often, one is deemed *great* at mathematics if they can recall and carry out the appropriate memorized rules and arrive at the correct solution. Furthermore, mathematics content is often taught in isolation and has little meaning outside of the classroom. Breaking away from this more *traditional* teaching of mathematics, which many scholars and mathematicians see as a misrepresentation of the art of mathematics itself, is clearly not easy. Despite researchers and scholars advocating for a break from this *traditional* approach for decades, for example, it is still prevalent in classrooms today.

Complicating the situation, there is no one way to teach mathematics, nor is there a single definition of mathematics amongst scholars, researchers, and mathematicians. Schoenfeld (forthcoming), however, offers one popular description of mathematics: “[M]athematics is the science of patterns, and relevant mathematical activity – looking to perceive structure, seeing connections, capturing patterns symbolically, conjecturing and proving, and abstracting and generalizing – all are valued” (p. 68). If one uses this understanding of mathematics to guide instructional practices in the classroom, then *traditional* teaching is not the approach needed. Regarding mathematics as a science challenges instruction to be more social and to include trial and error in the search of making meaning and sense, particularly when it does not fit the aforementioned procedures and rules often simply approached through memorization. Reflecting on what mathematics is and what it means to *do* mathematics, then, provides a foundation for how to teach mathematics. Davis (1990), for example, states, “the most fundamental job facing mathematics teachers is to foster the development of mathematical thinking in their students” (p. 168). Students must be engaged in the science of mathematics. Students must learn from trial and error with guidance from their teachers and be able to engage in academic conversations about their findings, successes, and failures.

The Role of a Mathematics Teacher

Teachers need to collaboratively reflect and revise their roles in mathematics’ classrooms in order for the trial and error process to occur and for academically rich dialogue to occur naturally. Yet, one teacher alone cannot change students’ notions and beliefs about mathematics. It must be a collective effort in which teachers work collaboratively and are not afraid to make mistakes as they try new techniques in helping students understand and *do* mathematics. There is no better time to try something new than when one first starts teaching. Mathematics teachers must discover and understand their role in making their students successful and Meredith did exactly this during her time in my (Amanda) classroom as a practicum student and student teacher.

Changing mathematics courses will not be easy, but through collaboration with others, it can slowly happen. Everyone, from veteran teachers to preservice teachers, brings a variety of experiences and ideas to the profession and these can be transformed into great opportunities for student learning to take place. “John Dewey pointed out long ago, one of the saddest things about U.S. education is that the wisdom of our most successful teachers is lost to the profession when they retire” (Hiebert & Stigler, 2004, p. 16). Through working with preservice teachers, particularly with Meredith this school year, I (Amanda) have taken a small step to ensure Dewey’s point is no longer fulfilled and ideas are shared, expanded, and applied. Together as a practicing teacher (Amanda) and a preservice teacher (Meredith), we worked to break from the *traditional* and engage our students in the science of mathematics over an eight-month period. The collaboration and challenge to continue to break from the *traditional* has continued even after Meredith’s student teaching experience in my classroom came to an end. The collaboration, though, now looks a little different with Meredith in her middle school student teaching placement

and me (Amanda) back in my classroom on my own. In many of the same ways, ideas are still brainstormed and critiqued, and challenges, frustrations and successes are being discussed to help both of us improve our instruction and development of our students' understanding of the science of mathematics. Through her student teaching experience in my classroom, we have each gained a critical friend to challenge our instruction to be even better, and she has gained a mentor as she continues to develop her teaching.

Collaborative Teaching in Action

As Meredith began her student teaching experience, I told her that now was the time to try something new, to experiment, and to discover the teacher she wanted to be. This was the perfect time as I was there to guide, challenge, observe, and experience every idea she had alongside her and our students. Meredith took my words to heart and did just that. She broke from the *traditional* upper level mathematics classroom norms. Led by her initiative, she and I brainstormed and developed a variety of strategies to engage students in lessons, encourage collaboration with peers, and build student stamina in the art of problem solving. Through our collaboration and Meredith's willingness and excitement in breaking from the *traditional*, our students were challenged to discover, discuss, and apply the elements of trigonometry being studied, as we worked to meet their needs through developing their understanding of the science of mathematics.

Culture of Curiosity and Exploration

One place Meredith started breaking from the *traditional* was by altering the culture of the classroom. As Hiebert (1997) notes, "The most important role for teachers becomes creating a classroom in which all students can reflect on mathematics and communicate their thoughts and actions" (p. 29). Students must feel respected and welcome to share their thoughts and ideas. A safe space must be created for learning to take place as errors will occur and be overcome, as it is part of the natural process of science and learning. Students must be open to share their strategies and take on the role as teacher at times. Allowing students to think about a problem and solve it with little guidance from the teacher leads to the discovery of students' thinking and meaning making.

Toward the end of Meredith's student teaching placement, we utilized a group work strategy that provided an opportunity for students to think critically and collaborate meaningfully with peers. Groups were assigned a trigonometric proof and asked to work only with their peers to solve the proof in a designated spot on the board. Students were up and out of their seats, discussing strategy, and problem solving their way through challenging problems, even as early as 7:15 in the morning! The system worked as follows, five to seven groups worked on proofs in various spots of the classroom. When a group finalized their answer and received approval by one of us, the group dispersed and merged into the other teams still at work. Over time, each group still problem solving continued to welcome a fresh set of eyes and new mindsets to their group. This prompted more discussion and questioning.

Near the end of this activity, there was only one group remaining. At this point, all students migrated to this final group. In the spirit of taking risks, fostering mathematical mindsets, and implementing new strategies in our classroom, we sat back as 25 students analyzed the problem together. Peers pointed out room within the proof for exploration, articulated algebraic strategies verbally, questioned the thought process of others to clarify any confusion, and eventually navigated their way to a complete solution. After many weeks of incorporating group work, class presentations, and meaningful discourse into our daily lessons, we found that the need for our guidance, questioning, and leadership lessened due to our students growing into the mathematical leaders and thinkers we were training them to be.

Develop Mathematical Understanding

Developing students' mathematical understanding, rather than memorizing rules and procedures, is an additional critical role of a math teacher. Instruction must promote understanding where students can apply what they are learning outside of the unit of study and make connections to what they have already studied (Hiebert, 1997). Teaching for understanding, furthermore, offers far more skills than teaching for memorization. The study of trigonometric identities, for example, stemmed directly from our students' understanding of the unit circle and how all of the

trigonometric functions were connected. This challenged our students to understand and apply the knowledge we had already been studying.

To introduce students to verifying trigonometric identities, Meredith had students in pairs piecing together verifying trigonometric two column proof puzzles. Students had to utilize prior knowledge of reciprocal identities, Pythagorean identities, and rules of algebra to correctly formulate the proof. Students were able to see the whole picture, but had to determine the mathematically appropriate order and justification in working to complete the proof. This allowed students to get a glimpse into their next task, verifying trigonometric identities in the form of a proof. Seeing a completed proof before being asked to come up with their own allowed students build confidence and an understanding of the expectation in verifying trigonometric identities.

Contribute to a Problem-Solving Toolbox

Students' problem solving toolbox expands when they develop a strong conceptual understanding. The more *tools* students have, the more problems they are able to solve, and thus their conceptual structure of mathematics is becoming stronger. Students must practice solving multiple problems in the classroom with the guidance of the teacher. Throughout problem solving activities, Heibert and Grouws (as referenced in Richland, Stigler, & Holyoak, 2012) noted, "connections must be made *by the student* (i.e., they cannot be made *by the teacher for the student*) and the making of these connections will require effort on the student's part" (p. 195). Students, therefore, must put in the effort and the teacher must minimally guide at times and encourage students to be persistent in reaching a solution. Students most successful in making connections are often the students given time to productively struggle when problem solving. Learning to struggle while solving problems is an important skill for students to experience and overcome, where payoffs come in the form of building connections.

We discussed ideas for approaching teaching graphing trigonometric functions and Amanda shared strategies from the past. Amanda was open for new ideas and I (Meredith) wanted to get the students talking and communicating early on in the

semester, so we led an exploration day. The day started with a brief period of teacher guidance, but only to develop the parent graph for the sine function. Then students, in small groups, were provided a variety of graphs all being transformed by one of the same elements (amplitude, period, or vertical shifting) and were guided through questions to analyze the changes in the graphs and in the function rules connected to the changes. Next, in groups, students were given a function rule and needed to make an educated guess on what the sketch of the graph would be based on what they had discovered with little guidance or teacher affirmation. The final part of discovery required students to share out and gather feedback from peers. This opportunity provided students with some examples to make conclusions and then allowed them to productively struggle to reach a sketch of their transformed sine function involving more than one transformation. Through this activity, students built an understanding of several transformations, primarily amplitude and period changes, taking place to trigonometric functions, which were unlike other functions they have studied.

Know your Students' Knowledge Base

When carrying out an exploration day or any activity involving problem solving, it is important for the teacher to provide appropriate guidance when necessary based on the students' knowledge. Teachers must be aware of the level of students' mathematical knowledge in order to lead them to effective understanding. Thus, another significant role of the teacher is to be flexible based on students' knowledge. Teachers must fill in the gaps when needed and allow for the struggle for students at times. However, when the teacher is aware of the students' knowledge base, the level of struggle can be monitored and altered. Quickly into our trigonometry unit, for example, it became evident that anything involving algebra was going to cause a struggle. This is where we, as teachers, had to attend to the level of understanding of our students and provide support.

We had to be certain to monitor our students' knowledge base as it connected directly into completing the problems involving trigonometry. In observing student work, we noticed the primarily cause for students' struggle to complete problems was related to operations with fractions, factoring,

and basic algebra. In particular, operations involving fractions was a far greater issue for our students than we anticipated. Had we recognized this earlier on, we could have devoted class time to these issues and helped build connections between these skills they had previously studied and the trigonometric functions they were currently investigating.

Another area of almost constant struggle that we discussed was factoring. When asking Amanda about how factoring was taught, I (Meredith) learned the many methods of factoring and how these different methods would impact students' ability to solve trigonometric equations. In other words, I had to be flexible with my approach to trigonometric functions in order to incorporate how students had previously discussed factoring. Through learning more about students' processes for factoring, I was able to help our students build on their factoring knowledge by relating trigonometric equations to the more basic algebraic equations they confidently solved. This created opportunities for students to make connections and recall their algebraic skills necessary for solving equations.

Utilize Multiple Strategies

The roles of mathematics teachers to create a safe culture of curiosity and exploration, to teach for mathematical understanding, to provide opportunities for problem solving, and to know their students' levels of understanding should be enacted via multiple strategies throughout the course of the school year (Davis, 1990). For example, if students need to reinforce their understanding, then it may be a great day to have the students working in groups with guidance from the teacher when needed. Through vocalizing their thoughts, both the teacher and the students will gain a deeper understanding of their knowledge and thinking. Many concepts can be introduced or explained through techniques such as puzzles, exploration days, and even matching activities. If students are working to review a concept, then a whole class review game can provide some competition and work to reinforce their learning and draw connections between their previous knowledge and help build new understanding. When whole group activities are too overwhelming for the class or the concept being studied, small

groups may be more beneficial. Even a mix of small groups merging to form larger groups like what we did with the students working to verifying trigonometric identities throughout the classroom could be an option. Other options for small group work include learning stations and exploration days. Students could even work in a small group to become an expert at a problem and then shuffle into another small group where they must become a teacher to the others. If students need to develop their confidence in their learning or work through complex tasks, then independent work, inquiry learning, bookwork, or paperwork may be of value, but it should challenge them to express their understanding (Vatterott, 2007).

One strategy, in addition to those already discussed, that has become more common and the students have enjoyed is when they get to play teacher during the lesson. Meredith watched me (Amanda) do this with one of my classes during her practicum experience and just a few weeks into student teaching, she tried it out herself and followed some cues from me, as we had to be patient and let the students struggle as a class to find the solution. In time, the class as a whole was able to figure it out. Later in the semester, Meredith intentionally wrote the notes such that students could lead their class through the lesson, and students did just that with little prompting. For material students are able to self-discover or understand from prior knowledge, having students willing to share their knowledge with classmates, with little prompting, demonstrates their understanding and knowledge of the science of mathematics. Our students continue to be excited for opportunities to teach their peers.

These are a few ways we collaboratively worked to break from the *traditional* norms of an upper level mathematics classroom. It began with building a classroom culture where students worked collaboratively, productively struggled to build and foster new knowledge, and were challenged to apply and make meaning of their knowledge gained. These strategies, along with others, continue the formation of a student's understanding of the science of mathematics. Furthermore, these strategies are helpful in thinking about how preservice teachers enter the profession and begin to collaborate with more

experienced practicing teachers.

Foundation for Strong Collaboration

Amanda and I (Meredith) experienced something unique within in my student teaching placement. The time filled itself with risk-taking, discovery, reflection, and joy. Our work led us to the question: How do you establish the foundation for powerful collaboration? Just as a classroom flourishes on a safe and respectful classroom culture, in the same way, collaborative teaching between a preservice teacher and a practicing teacher flourishes within a safe and respectful relationship. Amanda, from the very beginning, desired to know me beyond my credentials, my coursework, or my university program. We shared our families, our friends, and our upbringing. She knew me walking into my placement and never stopped getting to know me moving forward. Overtime, she knew I loved passing period hall duty, sharing silly riddles with my students at the beginning of each class, post-it notes for everything one can think of, and sacrificing a prep period here and there for laughter and a little break. She also knew early on that I needed to hear “looks great, remember, we try it and after we see how it runs, we will reflect and adjust as the day goes on” before taking a risk on a new lesson. The rapport she built with me, provided a firm foundation of trust. It was within that trust that came exactly what we set out to do: break from the *traditional* with collaborative teaching.

The Authors

Amanda Huffman is mathematics teacher at Pike High School in Indianapolis and a Butler University alumna. She completed her master’s thesis on the affordances of mentoring preservice teachers, and also trains preservice teachers.

Meredith Varner is a secondary mathematics preservice teacher who will be graduating from Butler University in May of 2018. She aspires to work as a high school mathematics teacher, and continue to collaborate with other teachers, including eventually providing future pre-service teachers similar opportunities she was fortunate to have in working with Amanda.

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Amanda Huffman (left) and Meredith Varner (right) smile for a picture in their classroom at Pike High School.

House Bill 1399 Passes

Indiana will soon have a license for elementary mathematics specialists. The Indiana Legislature recently passed House Bill 1399. The digest version of this bill states:

Elementary school teacher content area licenses. Provides that, not later than July 1, 2019, the state board of education shall adopt rules to establish elementary school teacher content area licenses that must, at a minimum, include an: (1) elementary mathematics specialist license; and (2) elementary mathematics teacher license or an elementary mathematics and science teacher license. Establishes requirements to be eligible for an elementary mathematics specialist license, an elementary mathematics teacher license, and an elementary mathematics and science teacher license. Requires the department of education (department) to develop an incentive program to assist and reward teachers who pursue and earn an elementary school teacher content area license. Provides that the department shall make recommendations to the general assembly regarding ways to accomplish the goals of the incentive program.

HAMTE members were instrumental in accomplishing this legislative milestone. The HAMTE EMS Task Force (Betsy Berry, Doris Mohr, and Sheryl Stump) used the *AMTE Standards for Elementary Mathematics Specialists* to help Representative Robert Behning draft the first part of the bill.

On January 25, they testified before the House Committee on Education along with HAMTE President Signe Kastberg, Asheley Harris (Noblesville Schools), Jessica Miller (Westfield Washington Schools), and Kathy Jones and Nick Meyer (Indianapolis Public Schools).

On February 21, Betsy and Asheley testified before the Senate Committee on Education and Career Development.

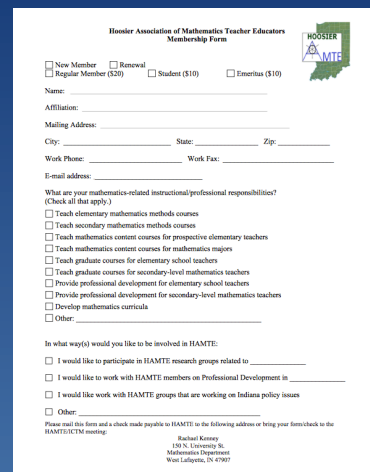
On March 8, the House concurred with the Senate amendments, so the bill is headed to the Governor for his signature. More details about the bill may be found at this website:

<https://iga.in.gov/legislative/2018/bills/house/1399>

Connect with HAMTE!

- **Visit our website:** Please checkout out our new website at <https://hamte.wildapricot.org>. This site will replace our current site at hamte.org, so please bookmark our new home. With our new page, we can now accept ONLINE MEMBERSHIP ENROLLMENT! There are options to enroll for one year, or for three-years at a time at a slight discount. Current (and some past) members have already been entered into the system and should be receiving emails from WildApricot telling you it is time to renew your dues. Another email will go out one week before the business meeting. The link sent in this email will help you create a password and join the site. Then you can pay for membership using the "Join Us" link. If you do not receive this email, you can still Join Us with this link at any time! Please share our new site!
- **Join a Working Group** or suggest a new topic to connect and collaborate with others across the state in order to address crucial issues in the field of mathematics education!
 - **Elementary Math Specialists Task Force**
 - **Facilitator:** Sheryl Stump, ssump@bsu.edu
- **Submit an article and/or teaching methods or ideas to the newsletter, HAMTE Crossroads.** You can also *write a special article for the new newsletter section called "Thinking Equity in Mathematics Education."* Email your submission or questions to Andrew Gatza, Newsletter Editor, at agatza@iu.edu. We publish Fall and Spring editions.
- **Attend the HAMTE Retreat on May 18th from 10am -3pm at the University of Indianapolis.**

BECOME A HAMTE MEMBER!



Indiana Association of Mathematics Teacher Educators
Membership Form

☐ New Member ☐ Renewal
☐ Regular Member (\$20) ☐ Student (\$10) ☐ Emeritus (\$10)

Name: _____

Affiliation: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Work Phone: _____ Work Fax: _____

E-mail address: _____

What are your mathematics-related instructional/professional responsibilities?
(Check all that apply.)

☐ Teach elementary mathematics methods courses
☐ Teach secondary mathematics methods courses
☐ Teach mathematics content courses for prospective elementary teachers
☐ Teach mathematics content courses for mathematics majors
☐ Teach graduate courses for elementary school teachers
☐ Teach graduate courses for secondary-level mathematics teachers
☐ Provide professional development for elementary school teachers
☐ Provide professional development for secondary-level mathematics teachers
☐ Develop mathematics curricula
☐ Other: _____

In what way(s) would you like to be involved in HAMTE:

☐ I would like to participate in HAMTE research groups related to _____
☐ I would like to work with HAMTE members on Professional Development in _____
☐ I would like work with HAMTE groups that are working on Indiana policy issues
☐ Other: _____

Please mail this form and a check made payable to HAMTE to the following address or bring your form back to the HAMTE/ICTM meeting:

Rachael Kenney
131 N. University St.
Mathematics Department
West Lafayette, IN 47907

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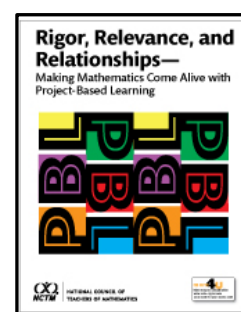
What's the Word on Campus?

University of Indianapolis

Jean Lee is President-Elect of Indiana Council of Teachers of Mathematics. **Christine Taylor** was elected as Secretary of Indiana Council of Teachers of Mathematics.

Enrique Galindo (IUB) and **Jean Lee** will present a session titled "Baby Steps to PBL Success: Lessons from Teachers Implementing PBL" at the 2018 NCTM Annual Meeting in Washington, D.C.

Jean Lee & Enrique Galindo (Indiana University – Bloomington) recently had their book, *Rigor, Relevance and Relationships: Making Mathematics Come Alive with Project-Based Learning*, published by NCTM. This book provides an overview of the essentials of project-based learning (PBL) and showcases classroom-tested PBL units addressing the CCSSM for the purpose of demonstrating how PBL works and the learning that results. They share projects that provide opportunities to learn rigorous mathematics necessary for college and/or career readiness, that engage students in authentic, relevant problems/challenges/issues, and that develop positive relationships between the school/teacher/students and community members. By reading this book and using materials available electronically, mathematics educators can design and implement PBL units while addressing the CCSSM, and develop 21st Century skills in their learners.



John Somers and colleagues published an article in *eCampus News: Technology News & Innovation in Higher Education* on how a school of education used technology to better support pre-service teachers. The article, "Creating successful teachers with video coaching," can be found at <https://www.ecampusnews.com/cc-blog/innovation-in-it/creating-successful-teachers-video-coaching/>.

Indiana University - Bloomington

Amy Hackenberg and a team of graduate students continue to work on project IDR²eAM, <http://www.indiana.edu/~idream/>. IDR²eAM stands for **I**nvestigating **D**ifferentiated Instruction and **R**elationships between **R**ational Number Knowledge and **A**lgebraic Reasoning in **M**iddle School and is funded by the National Science Foundation.

The purposes of this project are to investigate how to differentiate mathematics instruction for middle school students at different levels of reasoning and to understand how students' rational number knowledge and algebraic reasoning are related. In the first two years of the project (Phase I) we conducted three iterative, after school design experiments with cognitively diverse middle school students. In December 2017 we published our first article from this phase: **Hackenberg, A. J., Jones, R., Eker, A., & Creager, M.** (2017). "Approximate" multiplicative relationships between quantitative unknowns. *Journal of Mathematical Behavior*, 48, 38-61. In the third year (2015-2016, Phase II), we conducted retrospective analysis and co-led a Teacher Study Group (TSG) with 15 middle school mathematics teachers from around the state.

We are currently in Phase III, in which three teachers from the TSG are participating. Amy is co-teaching a unit with each of these classroom teachers to study how to differentiate instruction in classrooms, and to study how teachers learn to differentiate instruction. We have now completed two of these whole classroom design experiments, one in spring 2017 with a class of 8th grade students and, and one in fall 2017 with a class of 7th grade students. We will present from the experiment with 8th grade students at the NCTM Research Pre-session in April 2018.

Indiana University - Purdue University Indianapolis

GAMMA Project. At IUPUI, the Generalizations Across Multiple Mathematical Areas (GAMMA) project is in its fourth year. The broad purpose of the project is to explore the generalizations middle and high school students make. During the 2016-2017 year, the research team (**Erik Tillema** and **Andrew Gatz**) introduced the context of mathematically exploring racial bias in jury selection, and the mathematical generalizations students made in this context. This innovation, led by **Andrew**, was integral to him being awarded the *Wells Fellowship for the 2018-2019 school year*, one of the most prestigious fellowships for graduate students. During 2017-2018, **Weverton Pinheiro**, a first year graduate student from Brazil, joined the research team and contributed to the team's efforts to understand how high school students make generalizations about cubic relationships. The research team looks forward to finishing out the year and beginning a follow up project next year to examine how pre-service secondary teachers make generalizations about the binomial theorem, and how they can use their own generalizations to design instruction for secondary students.

Andrew Gatz will present a session titled, "Investigating Racism with Mathematics: Racial Bias, Quadratics, and Combinatorics" at the 2018 NCTM national research conference in Washington, D.C.

IUPUI Faculty Receive \$1.5 Million Grant to Prepare New STEM Teachers. A team of six IUPUI faculty members has been awarded a five-year, \$1.5 million grant to prepare undergraduate students for careers as secondary STEM teachers. The award comes from the National Science Foundation Robert *Noyce* Teacher Scholarship Program, which seeks to encourage talented science, technology, engineering, and mathematics (STEM) majors and professionals to become K-12 mathematics and science (including engineering and computer science) teachers.

The project, *Carver Teaching Initiative - Inspiring the Next Generation of STEM Teaching Professionals through Internships, Recruitment, and Engagement* (CTI – INSPIRE), will support internships and scholarships for undergraduate students pursuing STEM degrees and preparing for careers as classroom teachers. It will provide 90 summer internships, 25 two-year scholarships (up to \$16,500 each year), and professional development incentives for 15 first-year teachers.

The six faculty members leading the project are **Jomo W. Mutegi**, **Crystal Morton**, and **Craig Willey** from the School of Education and **James Hill**, **Tamiko Porter**, and **Robert Yost** from the School of Science. To learn more about the *Carver Teaching Initiative* (CTI) visit www.es2rp.org/projects.

Huntington University

Andrew Hoffman welcomed a son, Micah, with his wife, Angie, on February 7th.

This semester, Andrew added an education course, elementary math methods, to his usual load of mathematics courses. He is also offering a new math course, Geometry for Middle School Educators. It meets two times a week with the traditional Geometry course (geared more for future high-school teachers) and then once a week separately. The coinciding meetings have focused on geometric argumentation using Euclid's Elements. The separate meetings have focused on the NCTM's Essential Understandings of Geometry (Grades 6-8).

Butler University

Ryan Flessner has created – and is currently teaching – a new course entitled, “Thinking Mathematically.” Designed, primarily, for those focusing on secondary math education, the course examines pedagogies linked to teaching and learning math with understanding. Along with **Courtney Flessner** (Indiana University--Bloomington), Ryan is working with a Mathematics Teacher Research Group through the Indiana Partnership for Young Writers (IPYW; see section below). This group is comprised of classroom teachers and instructional coaches from across Indiana as well as one educator from Nashville, Tennessee. Ryan and Courtney also continue to offer math workshops for educators through IPYW. Spring, 2018 offerings focused on the teaching of mathematics in Early Childhood Classrooms, Geometry & Measurement, and Fact Fluency & Maintenance. This summer, Ryan and Courtney will be offering workshops related to Workshop Teaching and The First 20 Days of Math Teaching.

Susan Adamson currently serves as the Director of the Indiana Partnership for Young Writers. For the past several years, Susan has worked to increase the scope of IPYW’s offerings to include workshops related to the teaching of writing, reading, mathematics, and preschool children. Because of these forays into new areas, Susan is in the process of changing the organization’s name to the Partnership for Inquiry Learning. This name change will highlight the many ways that educators (pre-service, in-service, teacher educators, administrators, etc.) can work with the Partnership to engage in thoughtful reflection on their practice.

Steve Bloom is currently developing two new workshops for IPYW. These workshops, offered during the summer of 2018, will focus on incorporating children’s literature into primary and intermediate mathematics classroom. In addition to these new offerings, Steve continues to work with undergraduate students through his teaching of math methods courses for elementary education majors and a course in Butler University’s Honors Program that highlights the mathematical connections in the work of Lewis Carroll.

Purdue University

Signe Kastberg was awarded AMTE’s Excellence in Teaching Mathematics Teacher Education Award at this year’s annual meeting.

Laura Bofferding received a National Science Foundation 2-year exploratory ISTEM grant for her project, “Promoting Commenting and Debugging in Early Years Programming.” She also published an article: Bofferding, L. & Farmer, S. (2018). Most and Least: Differences in Integer Comparisons Based on Temperature Comparison Language. *International Journal of Science and Mathematics Education*. Advance online publication. <https://doi.org/10.1007/s10763-018-9880-4>

Lizhen Chen presented at AMTE, which was supported by a HAMTE travel grant.

Chen, L. & Bofferding, L. (2018). *Interpreting and representing students’ thinking in the moment: Preservice teachers’ initial multiplication lessons*. Paper presented at Twenty-Second Annual Association of Mathematics Teacher Educators conference (AMTE). Houston, TX.

Brooke Max presented at AMTE with HAMTE members Sheryl Stump and Betsy Berry on ways in which each of them address the new AMTE Standards (Standard P.2) in mathematics content for elementary teachers courses.

Lane Bloome was awarded Purdue’s Bilsland Fellowship, which will fund his dissertation project for one year. Lane’s dissertation proposes to study mathematics identity formation amongst college-bound students from rural communities.

Indiana University - Southeast

Indiana University Southeast Launches STEM Project. On February 20th, IU Southeast officially began a new initiative to increase the quantity and quality of Science, Technology, Engineering, and Mathematics (STEM) teachers in its service area. The Growing Tomorrow's STEM Teachers (GTST) Project is funded by a \$240,000 grant from the Indiana Commission for Higher Education (ICHE). Background research by the School of Education revealed 875 mathematics students, 725 technology students and 900 science students plan to take dual-credit high school courses this year from our local school corporations. In Indiana high school dual-credit teachers are required to have 18 graduate content hours in their subject area, yet many current and future dual-credit teachers in the IU Southeast service area do not have this extended content background.

The GTST Project will update current and develop future dual-credit STEM high school teachers to meet Indiana's new requirement of 18 credit hours in graduate-level content courses through the IU Southeast School of Education Master in Secondary Education with a Concentration in either Mathematics, Technology, Biology, or Chemistry graduate degree program. Additionally, the GTST Project is increasing the number of new STEM middle and high school teachers through an Indiana-approved, three-semester, Advance to Teaching (A2T) licensure pathway for post-baccalaureate candidates.



Candidates in the new Growing Tomorrow's STEM Teachers program at the recent launch event. Standing, L-R: George Stackhouse, Alexandria Lilly, Matt Nelson, Christopher Reynolds, Tuesday Guernsey; seated, L-R: Kacee Hussung, Brittney Goode, Kelly Book, Brooke Stewart.

For more information about becoming involved in the GTST Project, contact Dr. **Alan Zollman** at Indiana University Southeast, alanzoll@ius.edu.

Indiana University – Southeast ... continued.

IU Southeast Teacher Candidates Meet Incoming NCTM President Robert Berry. Indiana University Southeast Mathematics Teacher Candidates attended the Greater Louisville Council of Teachers of Mathematics Winter Meeting on February 20th with National Council of Teachers of Mathematics President-Elect Dr. Robert Berry.



From left to right: Barbara Schwartz, Natalie LeCompte, John Casey, Robert Berry, Brooke Visker, Samantha Phipps, and Alan Zollman

A NOTE ABOUT PERSPECTIVES SHARED:

*The perspectives presented in articles within issues of **HAMTE Crossroads** represent the views of individual authors and do not necessarily represent the views and positions of the HAMTE organization.*