

THE WRIGHT MESSAGE

DEPARTMENT of MATHEMATICS

2016–2017

UNIVERSITY OF NORTHERN IOWA



Dear Alumni and Friends,

We are delighted to bring to you the 2016-2017 edition of our department newsletter, *The Wright Message*.

We have divided the newsletter into five categories of stories, each focusing on either members of our constituency groups or significant events which took place in the department this past year.

We put a spotlight on students Julie Kirkpatrick, Jesse Moeller, Toby Maggert, and Lindsey Peterson. We have chosen them from among the many fine students we have in the department because they represent and exemplify, both in their scholastic achievement and departmental citizenship, the very best we expect of our students. These students also showcase the promise our programs have for the students we serve.

We have also included a spotlight on two alumni, Heather Rabara (2001) and Curtis Martinek (2003). Heather worked her way up the professional ladder as an actuary and is now a Vice President and Managing Director for Workplace Investing at Fidelity Investments. Curtis is a highly successful high school teacher at Gilbert High School and was a finalist for the 2015 Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST). We hope you will find these spotlights on Heather and Curtis as inspiring as we found them.

In another category, we have included a spotlight on Robert R. Johnson (MA, '66). The Johnsons have made planned gifts to the department, including a gift to establish an endowed scholarship. After receiving his master's degree from UNI, Robert pursued a very successful career as a community college professor. Along the way, he co-authored a highly successful statistics textbook which is now in its 11th edition. Find out more on Robert inside the newsletter.

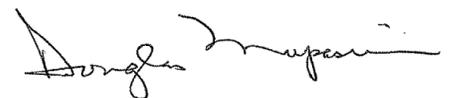
We have also written stories that profile Professor Min Ho Lee and alumna Allysen Lovstuen. Dr. Lee is a 30-year veteran on the department faculty. Professor Lee's educational journey took a non-linear path to mathematics, which will surprise some readers and resonate with others. He had a master's degree in mechanical engineering before he embarked on graduate studies in mathematics. A prolific researcher with over 100 publications in some of the most prestigious journals, his story shows that if one is lucky enough to identify a career they are passionate about, it is never too late to pursue it.

Allysen Lovstuen (BA, 2001) was the department's 2016 Alumna in Residence. She is an accomplished high school mathematics teacher at Decorah High School. You may recall that we previously featured Allysen in 2015-2016 *Wright Message* after she won the 2014 PAEMST Award.

We round out the newsletter with a story about the 2016 Hari Shankar Lecture by Prof. Philip Kutzko, a piece on the Mathematics Education Summit by Prof. Catherine Miller, a farewell piece to Dr. Karen

Sabey who retired in June 2016, and a compilation of sundry news from "Around Wright Hall."

The stories in this edition of the newsletter demonstrate that the state of the department is strong. We are grateful to you, our friends and alumni, for the much needed support you continue to provide to us and to the students we serve through your contributions to our UNI Foundation accounts. In all, we received \$98,020 in gifts and pledges and \$200,000 in planned gifts between July 1, 2015, and June 30, 2016. Most of the money funds scholarships, but some goes to accounts that cover other expenses (equipment, faculty professional development, and travel to conferences by faculty and students). The department has awarded \$158,686 in scholarships to undergraduate and graduate students for the 2016-2017 academic year, a decrease of 11.78% over last year. As you know, many students are graduating with huge student loan debts, on average \$22,313 at UNI. They greatly appreciate any financial support we can offer them. We are appealing for your help again this year. If you are able to contribute, please use the enclosed form to direct your contribution to the account of your choice. Again, thank you for your support. We hope 2016 was good to you and that 2017 will be even better.



Douglas Mupasiri
Professor and Head

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Editorial Team:

Betty Bagenstos, Douglas Mupasiri
and Marius Somodi

A Tribute for Karen Sabey

By Douglas Mupasiri



Karen Sabey started her teaching career at UNI in 2004 as an adjunct faculty member teaching mathematics education courses and remained in that role until 2011.

Before coming to UNI she had served as an adjunct faculty member at Wartburg College, Waverly, IA, from 1992-2006. Prior to her appointment at Wartburg College, Karen had earned a B.S. in Mathematics at Western Illinois University at Macomb, IL, and a M.A. in Mathematics Education at DePaul University, Chicago, IL. By the time Karen got to Wartburg, she had had a long and successful career, stretching over 20 years, as an elementary and high school mathematics teacher in Illinois. Always driven to advance herself, she enrolled in the doctoral program in Curriculum and Instruction in the UNI College of Education in 2001. In May 2009 she received her EDD in Curriculum and Instruction. In Fall 2011 she joined the tenure/tenure-track faculty at UNI as an assistant professor in Mathematics Education and remained in that rank until she retired in summer 2016.

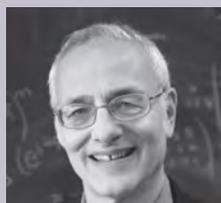
Karen taught eleven undergraduate mathematics courses, mostly in our Elementary Education, Middle School/Junior High and Secondary Teaching offerings, but also some of the lower level mathematics

courses. Karen was the go-to instructor for our Mathematics for Elementary Students with Special Needs – a course she invested a tremendous amount of time and effort in and deeply cared about. She also taught courses in our graduate mathematics education programs.

In her short five years as an assistant professor, Karen will be remembered for the passion, hard work and effort she put into the Mathematics Education Library, which she had inherited from Dr. Diane Thiessen, who had run it for years until she retired. One example of the impact she had on the Mathematics Education Library operations is that Karen worked with the staff at Rod Library to catalog the holdings in the Mathematics Education Library, which made it easier to track materials. This improvement also made math education library holdings accessible to the Cedar Valley community.

Karen was also a great team player. She collaborated with her mathematics education colleagues on a number of projects. She routinely met with colleagues teaching other sections of the classes she taught to discuss and reflect on how things were going. I know no one who worked harder at improving her teaching and put in long hours helping her students than Karen did. We wish Karen well on her retirement. We will miss her.

The 2016 Hari Shankar Lecture



Dr. Phil Kutzko
Speaker, 2016

The Hari Shankar Mathematics Lecture Series is an annual event hosted by the Department of Mathematics, which features a lecture intended for general audiences given by a distinguished personality in the Mathematical Sciences. This year's guest speaker was Dr. Phil Kutzko. The title of his talk was "It's an ethnic thing. Cultural challenges to broadening participation in mathematics."

Phil Kutzko is a Professor of Mathematics and CLAS Collegiate Fellow at the Univer-

sity of Iowa. He has served as the Director of the National Alliance for Doctoral Studies in the Mathematical Sciences since its inception in 2006 and serves as PI and Senior Advisor to the Alfred E. Sloan Foundation/University of Iowa Center for Excellent Mentoring. Professor Kutzko is a Fellow of the AAAS and a Fellow of the American Mathematical Society. His work in broadening participation in the mathematical sciences has been recognized by the 2014 American Mathematical Society Award for Distinguished Public Service and by the 2008 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (awarded in a White House ceremony by President Obama in January, 2010).

Faculty Spotlight



Min Lee

Min came to UNI in 1986, after completing a three-year post-doctoral appointment as a Hill Assistant Professor of Mathematics at Rutgers University. Surprisingly, his early career plans did not involve mathematics, at least not as a field of study. Says Min: "I had planned to be an engineer and received a master's degree in mechanical engineering in Korea. When I was teaching engineering at the Korea Naval Academy to fulfill my mandatory military service, I picked up some mathematics books and instantly fell in love and decided to study mathematics after finishing my military service. Since I had not taken any formal mathematics courses beyond differential equations, I was accepted as a graduate student at the State University of New York at Stony Brook only in the applied mathematics department. I moved to the pure mathematics department after a year." Min earned his Ph.D. in mathematics in 1983.

In his thirty year long tenure at UNI, Min has taught over thirty different mathematics courses, ranging from freshman to graduate-level. His favorite course to teach is Differential Equations because "the students seem to appreciate seeing mathematics being used in various problems in physics and engineering."

Min has also supervised undergraduate and graduate research projects, while developing a rich personal research program. Earlier in his career, Min's research involved problems from algebraic geometry related to number theory. His recent research area is number theory but, over the years, he has also written several articles on topics that are not directly related to algebraic geometry or number theory. Min feels that the higher teaching load of UNI faculty members, compared to colleagues at research universities, makes it more difficult to be very productive in research.

However, his list of publications is absolutely remarkable: a monograph and over 100 articles published in some of the most prestigious mathematics journals. Two of these articles, written jointly with Professor Youngju Choie of Pohang University of Science and Technology in Korea, are among Min's favorites: *Quasimodular forms and Jacobi-like forms*, published in *Mathematische Zeitschrift* in 2015, and *Symmetric tensor representations, quasimodular forms, and weak Jacobi forms*, published in *Advances in Mathematics* in 2016. Both articles present various properties of quasimodular forms in connection with modular forms and Jacobi-like forms. He is currently writing a monograph about the theory of quasimodular forms in collaboration with Professor Youngju Choie.

Min is the recipient of several awards, including the Donald N. McKay Faculty Research Award, which he received in 2004, and the UNI College of Natural Science Dean's Award for Superior Achievement in Research, which he has won twice (in 1995 and 2004). In addition, in 2005 he received the Regents Award for Faculty Excellence, an award, which the Iowa Board of Regents uses to acknowledge and honor university faculty members.

Min enjoys playing the piano – "although I am not good at it", he adds with modesty. He is married to Virginia, who is a piano teacher, and they have two daughters: Jenny, who is a chemical scientist, and Katie, who is a dentist.

STOP BY DURING HOMECOMING

2017 is the 100th anniversary of the opening of Wright Hall, and the 25th anniversary of its reopening after extensive renovation in 1992 (and the 60th anniversary of the name change from Vocational Building to Wright Hall). Construction began in 1915, and in summer term 1917 students in agriculture, manual training, domestic science, and art first entered Wright Hall. The Mathematics Department moved into Wright Hall in 1949 and has been based here since that time, except during the renovation prior to 1992. We shall have an open house during homecoming 2017 to honor Wright Hall's Centenary - the time will be announced in the homecoming schedule.

A brief history of Wright Hall is available at:
[www.library.uni.edu/
collections/special-collections/
university-archives/
building-histories/wright-hall](http://www.library.uni.edu/collections/special-collections/university-archives/building-histories/wright-hall)

Around Wright Hall

Faculty news

Douglas Mupasiri was appointed Chair of the American Mathematical Society (AMS) Committee on Education (COE) by AMS President and Duke University Mathematics Professor Robert Bryant. His two-year term started on February 1, 2016. Professor Mupasiri has been a member of AMS Committee on Education since 2014. As Chair of the COE, he also serves ex-Officio on the AMS Committee on Science Policy.

TJ Hitchman serves as the first Chair of the newly formed Special Interest Group of the MAA (SIGMAA) on inquiry-based learning (IBL). According to the Mathematical Association of America's website, "the purpose of IBL SIGMAA is to bring practitioners and others interested in IBL together to share teaching resources and experiences, encourage and publicize research related to IBL, and to promote the proliferation of IBL in Mathematics through conversation and professional development." Dr. Hitchman's one-year term will expire in January 2017.

Shangzhen Luo and Michael Prophet were among the recipients of eight-week summer fellowships awarded by the UNI Graduate College. Dr. Luo's project title was "Stochastic Differential Games for Insurance Risk Processes" and Dr. Prophet's project title was "Chalmers' Equation and Minimal L_p Projections onto the Lines."

Douglas Shaw gave a talk at the Clear Lake public library about Great Books. The event was booked through the UNI Speakers Bureau. In addition, Dr. Shaw also gave a talk on Applied Improvisation for Professors at the International Applied Improvisation Network conference in Montreal, Canada.

Elizabeth Hughes, Megan Balong, and Michelle Van Winkle (a kindergarten teacher) gave a talk titled "Using the 5 practices in the early childhood classroom" at the Annual Conference of the National Council of Teachers of Mathematics, San Francisco, CA. In addition, Elizabeth and Megan presented a talk "Using the 5 practices for orchestrating productive mathematics discussions in the early childhood classroom" at the Iowa Council of Teachers of Mathematics Annual Conference in Des Moines.

Douglas Mupasiri gave a talk at the Fourth Annual Conference for the Exchange of Mathematical Ideas, at Embry-Riddle Aeronautical University in Prescott, AZ. The title of his talk was "A Grothendieck compactness theorem for the Mackey dual topology." Dr. Douglas Mupasiri also gave an invited talk titled "Learning Outcomes across the Precalculus to Calculus II sequence" at the MAA conference on Precalculus to Calculus; Insights and Innovations, University of St. Thomas, St. Paul, MN.

Elizabeth Hughes, Mollie Applegate, and Anne Estapa (of Iowa State University) presented an invited talk "Effectively using the Mathematics Teaching Practices with Pre-Service Teachers" at the Iowa Association of Mathematics Teacher Educators Annual Conference in Cedar Falls.

The joint research of Suzanne Riehl and Olof Steinthorsdottir was shared in several venues. At the 2015 Fall Conference of Iowa Council of Teachers of Mathematics, they, with their undergraduate researcher Rebecca Holzrichter, presented "The Hierarchy of Missing Value Proportion Problems" to middle school teachers. In November, at PMENA-37 (Psychology of Mathematics Education - North American

conference), they presented "Student Success and Strategy Use on Missing-Value Proportion Problems with Different Number Structures". The talk "Routes to Reason: Proportional Reasoning in Middle School Students" was presented both as a department colloquium and as part of the UNI Graduate School's Brown Bag Lecture series. "Students' Strategies on Missing Value Proportion Problems" was shared at the June 2015 Cognitively Guided Instruction conference in California. From this presentation, the Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching invited Dr. Steinthorsdottir to design and provide a three day professional development workshop to mathematics coaches that work with over 500 middle school teachers in Texas.

Student news

A team of three undergraduate students in our department consisting of Nicholas Croston, Jake Weber, and Chanlika Parker, was invited to participate in the June SIAM meeting in Boston, MA. The team made a presentation of a course project they had worked on under the supervision of Dr. Michael Prophet. Their project



Left to right: Zachary Youmans, Jake Weber, Chanlika Parker

involved solving an aircraft schedule optimization problem, which the student team approached using genetic algorithms. The project was part of the PIC Math program (Preparation for Industrial

Careers in Mathematical Sciences) sponsored by the Mathematical Association of America. Zachary Youmans, an undergraduate student in our department, was also among the participants.

Naoya Uematsu, a former graduate student in our department, completed a year-long research project in graph theory and wrote his Master's degree thesis under professor Douglas Shaw's supervision. His thesis' title was "Lights out game with cellular automaton." Naoya graduated from UNI in May 2016. He is currently a PhD student in Applied Mathematics at Osaka University Graduate School of Information and Technology.

Jesse Moller, a former graduate student in our department, presented a talk based on his master's degree thesis at the Fourth Annual Conference for the Exchange of Mathematical Ideas, at Embry-Riddle Aeronautical University in Prescott, AZ. The title of his talk was "Some Convergence Properties of Minkowski Functionals on Polytopes." Jesse is currently pursuing a PhD in mathematics at the University of Nebraska-Lincoln.

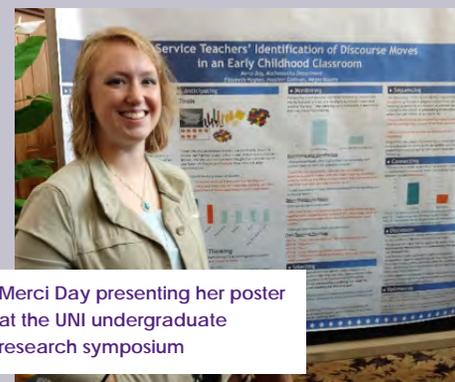
An article co-authored by Mark Ronnenberg, currently a graduate student in our department, and Professor Olena Ostapyuk was accepted for publication by *Involve: a journal of mathematics*. The article, titled "Discrete Dynamics of Contractions on Graphs," summarizes the results of an undergraduate research project conducted from Fall 2014 to Fall 2015.

On February 2, 2016, UNI hosted the Iowa Collegiate Mathematics Competition. Approximately 60 students, or 21 teams, representing 11 colleges and universities throughout the state participated in the contest. UNI was represented by one team that consisted of Kevin Conger, Cameron Hertzler, and Colin Pint.

The thirteenth annual Midwest Undergraduate Mathematics Symposium (MUMS) was held on April 9, 2016, at Simpson College. Four UNI students: Heather Bavido, Ryan Giarusso, Julie Kirkpatrick, and Tracy Wulfekuhle, participated in this event. Julie and Tracy presented the poster "Bridge numbers: a knotty journey" based on their research project supervised by Dr. TJ Hitchman.



Heather Bavido presenting her poster at the UNI undergraduate research symposium



Merci Day presenting her poster at the UNI undergraduate research symposium

This summer, two UNI mathematics majors were recipients of summer undergraduate research fellowships funded by the Dean of the College of Humanities, Arts, and Sciences: Heather Bavido, a liberal arts mathematics major, worked on a research project on 3D modeling and printing for mathematics (advisors: TJ Hitchman and Bill Wood); Merci Day, a secondary mathematics teaching major, worked on a research project titled "Talking about Classroom Discourse" (advisors: Elizabeth Hughes, Heather Gallivan, Megan Balong). Heather and Merci presented posters at the UNI undergraduate research symposium on July 29, 2016.



Julie Kirkpatrick (center) and Tracy Wulfekuhle (right) presenting their poster at MUMS

Alumnus Spotlight

Curtis Martinek



Alumnus Curtis Martinek (B.A. '03, M.A. '06) is a high school teacher and assistant football coach at Gilbert High School. Curtis is an exemplary teacher and a true embodiment of the promise of a UNI teacher preparation education. He was a finalist for the Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST). We naturally were curious to find out Curtis' take on what accounts for his tremendous success at this stage in his career as a teacher. To satisfy our curiosity, we decided to ask him to answer a list of questions. Our questions and his responses to them follow.

When did you decide to become a mathematics teacher?

I knew I wanted to be a math teacher in high school. In sixth grade I was given a chance to teach a few math lessons, which I enjoyed, to my peers. In high school, I debated between engineering and teaching math. Several other students would ask me questions during study hall and class and I enjoyed the challenge of the mathematical concepts as well as helping the other students.

What are the main reasons why you chose UNI over other colleges and universities?

There were several reasons I chose UNI. First, UNI is well-known for its teacher education program and I had decided to go into teaching before applying to colleges. Second, I appreciated the focus of the UNI

faculty on student learning. Although the professors are involved in research, their main focus is teaching students. In my lower-level math classes, class sizes were around 30 and taught by a professor. This is very different from the model used by many universities where the lectures can have as many as 200 or more students, complemented by recitations run by graduate students. Third, the size of UNI seemed right for me. It was big enough that I could find a wide variety of activities and events but small enough that I did not feel I would just be another name on the paper to my professors. I was so confident of my choice in UNI that it was the only college I applied to my senior year of high school.

What were your first impressions of UNI? Have these impressions changed over time?

UNI is an exciting place. People are very friendly and welcoming. There is an atmosphere of exploration and a desire to learn. The campus and surrounding community is full of things to do with enough variety that everyone should be able to find something they enjoy while at UNI. My impressions were confirmed when I was back on campus for a few summers to pursue a graduate degree.

Are there any courses in our department that you feel have made a significant impact on your growth as a mathematician and/or future teacher?

There are too many courses to name. The methods classes which focused on the NCTM process standards helped me develop ideas to get future students to understand mathematics. While the labels are slightly different now, the concepts behind the NCTM process standards now appear in the Iowa Core Mathematical Practice Standards. Dr. Miller did a great job of teaching us to reflect on our lessons with the lens of the NCTM process standards in methods classes. My math classes forced me to think and work through challenging problems, which is the key to learning. It was a model I have tried to use with my students. Many of the math professors taught using methods similar to ones we learned about in the teacher education program. In particular, Dr. Shaw, Dr. Ribando, Dr. Ecker, Dr. Stanley, Dr. Mupasiri, and Dr. Marius Somodi were all professors who gave difficult problems but encouraged communication with other students and were willing to patiently ask questions to get us back on track instead of just giving the answer. They have been

great role models for my teaching career along with Dr. Miller who helped us learn the pedagogy of teaching mathematics.

Do you have any particularly memorable experiences at UNI?

I remember having fun in all settings at UNI. I was part of a regular study group that would study in Maucker Union at a specific table. The problems we worked on were challenging but we had fun trying to solve them. I also had fun in other settings including silly things like playing mini golf in the hallway at Bender or spending time together off campus.

Based on your own experiences, what role do you think field experiences play in the development of future teachers?

The field experiences were the most important part of the teacher education program to my development as a teacher while at UNI. I was fortunate to have very reflective teachers to work with during my field experiences. They allowed me to teach many more lessons than the minimum required and then asked me to reflect on how the students had responded to the lesson. They then gave additional feedback after I had finished sharing my thoughts. This helped me to develop an ability to self-evaluate and look for areas of improvement in the way I teach.

What kind of teacher do you aspire to be?

I hope to be the kind of teacher whose lessons students will appreciate years after they have completed my class. I hope students feel challenged in my classes but also feel comfortable enough with their classmates and me to communicate with each other and ask me questions if there are concepts that do not make sense to them. While students may not always enjoy the problems I ask them to tackle, I hope they can appreciate the learning they gain from the challenge.

What do you enjoy doing in your free time?

My wife and I have two boys aged 5 and 7. They keep us very busy and I enjoy spending time with my family. We like to play games together and have a lot of fun camping. I also coach freshmen football.

Alumna Spotlight

Heather Rabara



Heather came to UNI in 1997 to pursue a BA degree in Statistics and Actuarial Science. After her junior year, she moved to Connecticut to participate in a summer internship at Cigna with a group of actuarial students from around the country. As is frequently the case, after her senior year, Cigna extended Heather a full time job offer which she accepted.

Heather met her husband Paul at UNI in 2000, when he held the door open for her at the library. They got engaged at the UNI Campanile in June 2001, and moved to Connecticut shortly after their graduation in 2001. Paul and Heather were married in 2002 and had their sons Reid (born November 2004) and Benjamin (born April 2006) during their time in Connecticut.

After graduating from UNI, Heather worked for two years at Cigna Health Care, as a Pricing Analyst, pricing HMO and PPO health care plans for Northern California and the Pacific Northwestern region. In 2003, she moved to Prudential where she worked for almost three years as a Retirement Pricing Lead, pricing business for the Northeastern, Western, and Mid-Atlantic territories. In 2006, she decided to join the Western region sales team of the company. This move required Heather and her family to relocate from Connecticut to Southern California, and they have been living in Orange County ever since.

Heather's career at Prudential was full of professional accomplishments: after serving as an Assistant Sales Director, she joined the Benefit Funding Services Group as a Retirement Plan Consultant. In that capacity, she acted as an Investment and Compliance consultant for 22 higher education 403(b), 401(k), and governmental 457 Retirement Plan Committees. In August 2009, Heather became a Vice President and Regional Sales Director of Prudential Retirement, where she was responsible for 401(k) retirement plan sales of between \$8-\$100 million in total assets. Two years later, she became a Vice President for Key Accounts, serving as a Director for the Prudential Retirement large market accounts located in the West Region.

In 2013, Heather left Prudential and moved to Fidelity Investments, as a Vice President and Managing Director for Workplace Investing. Her responsibilities involved developing, managing, and maintaining strong institutional client relationships. In August 2016, Heather was promoted to Senior Vice President - Consultant Relations at Fidelity Investments, where she develops and maintains strong, proactive relationships with key consulting and advisory firms in the Western U.S.

Says Heather: "While I started my career in actuarial science, my career deviated from it as it progressed, as I moved up the ladder in sales, consulting, and client relations. However, my education at UNI, specifically in actuarial science, has been a major reason for my success. It opened so many doors for me early on in my career, and gave me the rare opportunity to choose among various offers, since actuaries were (and still are) in such high demand. The critical thinking skills a person develops as an actuarial student are invaluable. The fact that I have a math degree, passed actuarial exams, and worked in this field has given me credibility, especially when describing my experience to someone I'm meeting for the first time, or trying to establish rapport or trust with. My education at UNI gave me a strong, powerful foundation in how to be inquisitive, approach problem solving, and collaborate. Dr. Kirmani was an influence on my life that I am so very grateful for."

MATHEMATICS EDUCATION CONFERENCE AT UNI by Catherine Miller

In March of 2016, the mathematics education world converged at UNI. Starting on March 28, a three-day conference was held on the UNI campus. The goal of the conference was to provide the participants an opportunity to revisit the history of mathematics education related to standards, discuss current issues, and explore ways of adopting a proactive posture as we look to the future. Thirty-six state leaders in mathematics education attended one or more days of the meeting. Participants included school-based and AEA professionals, representatives from the state Department of Education and mathematics education faculty from Iowa's Regent institutions, and four-year and community colleges.

The Mathematics Education Leadership in a Time of Change: Past, Present and Future conference featured three well known speakers. First was John Staley, current president of the National Association of Supervisors of Mathematics, sharing aspects of his work with this organization and as the mathematics curriculum director of the Baltimore, MD schools. Incoming National Council of Teacher of Mathematics (NCTM) president Matt Larson called on participants to fully engage with what is happening in mathematics classrooms throughout the nation, and looked forward to a time when all US children received education in mathematics that opens doors for their 21st century futures. Finally, John Dossey, who retired from Illinois State University's mathematics department (he is now working at the University of Arizona in Tucson) and was the president of NCTM when the original standards document was released in 1989, reminded us of where we have been so we could learn from our history as we moved forward.

On March 31, Jo Boaler was brought to campus as part of the Ed Perspectives series hosted by the Center for Educational Transformation, which is funded by the Board of Regents to support research and innovation in education. Dr. Boaler, who was the fourth well known mathematics educator to be at UNI that week, gave the talk High-Leverage Teaching Practices for a general audience of educators.

The convergence of mathematics education leaders on campus confirms, once again, the important role the UNI Department of Mathematics continues to play in mathematics education in Iowa and the nation.

News from the Center for Teaching and Learning Mathematics

by Julie Creeden

The vision of the Center for Teaching & Learning Mathematics (CTLM) is to make powerful learning a reality for every person we serve. Led by this vision, the center remains committed to placing its main focus on service to others. Under the leadership of its director, Dr. Vicki Oleson, the center has become very skilled at seeking out a particular need and then filling it. One area in which this service is very apparent is the CTLM's professional development courses. These courses are designed to directly improve teacher practice and enhance student learning for both general and special education teachers throughout the state of Iowa. Currently, the center is working to create web-based facilitator guides for its Teaching Mathematics to Struggling

Learners (TMSL) courses. Also, the iBook facilitator guides previously developed by the center are now being utilized for facilitator training in order to scale the Making Sense of Mathematics and Teaching (MSMT) courses in the Waterloo Community School District.

In addition, recent funding of \$1.5 million from the Department of Defense Education Activity has allowed the center to expand its MSMT courses beyond Iowa's borders as it works via the Military-Connected Academic and Support Programs to train facilitators in the Mascoutah Community School District in Mascoutah, Illinois. Nearly 60% of kindergarten through 8th grade students in the Mascoutah elementary and middle schools

are military dependent as the children of active service members, civilian employees of the Department of Defense, or employees of an organization housed at Scott Air Force Base. The district has focused upon updating its mathematics curriculum to address the changes to the New Illinois Learning Standards incorporating the Common Core State Standards in mathematics. The district's curriculum committee found that resources and textbooks are not currently available that reflect the new standards. They also discovered that there was not sufficient time to support parents regarding the changes in standards or to provide parents with additional homework strategies to support their children.



2016-2017 TENURE-STREAM FACULTY:

Russell Campbell

Mark Ecker

Sam Eskelson

Adam Feldhaus

Heather Gallivan

Joel Haack

Theron Hitchman

Elizabeth Hughes

Syed Kirmani

Min Lee

Shangzhen Luo

Catherine Miller

Douglas Mupasiri

Vicki Oleson

Olena Ostapyuk

Michael Prophet

Suzanne Riehl

Chepina Rumsey

Doug Shaw

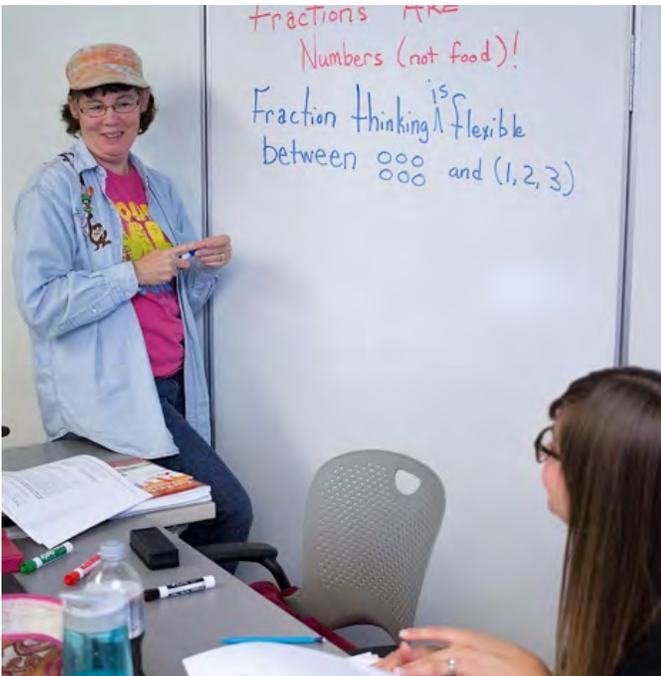
Marius Somodi

Adrienne Stanley

Olof Steinthorsdottir

Brian Townsend

Bill Wood



The CTLM is well-positioned to help address these concerns. Thus, the following project goals have been put in place by the CTLM to provide academic support for Mascoutah's military dependent youth:

- Improve the academic achievement of military dependent elementary and middle school students in mathematics, and
- Improve parents' ability to support their students' learning at home by increasing parental understanding of current methods of mathematics instruction.

In addition to this new project in Illinois, the CTLM has also extended a three-year contract with the South East Educational Cooperative (SEEC) of North Dakota for the use of the center's Making Sense Family Resources (MSFR). The goal of this contract is to increase family engagement in the after school programs run by the SEEC. Julie Creeden, Writing Coordinator at the CTLM, recently presented at the 21st Century Learning Centers

Summer Conference on the use of the MSFR to help reach this goal. Creeden will make another trip to Fargo later in the fall to provide training for a Making Sense Family Night in order to help SEEC families better utilize the resources.

The CTLM staff is small but certainly mighty! Oleson is assisted by Karis Townsend, CTLM assistant director. Creeden's writing team includes Amy Frohardt-Schafer and Jean Hitchman. Hitchman also assists course facilitators Connie Terry (Green Hills AEA) and Lynn Selking (Great Prairie AEA) and supports teachers as they implement course innovations in their classrooms. Dana Lechtenberg, the center's art director, works together with Jon Chamberlain, multimedia director at the center, and Frohardt-Schafer, CTLM editor, as they continue to create high quality resources which accompany both the professional development courses and the Making Sense Family Resources. This talented team makes it possible for the CTLM to continue along its path to making powerful learning a reality for every person we serve.

Interview

Allysen Lovstuen



Allysen Lovstuen

Allysen Lovstuen, a UNI graduate with a BA in Mathematics Teaching (2001) and MA in Mathematics with Secondary Teaching Emphasis (2006), is the recipient of the 2013 Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST) awarded by the White House. A teacher at Decorah High School, Allysen visited our department recently and went to Peet Junior High and Cedar Falls High School to observe student field experience activities. During the visit, we asked her, and she agreed to answer, a few questions for our readers:

Tell us about the PAEMST application process.

The process starts with a nomination. The person can be nominated by a student, a parent, someone at the Area Educational Agency, or can even self-nominate. The application requires that you submit an uncut and unedited videotape of an entire class period along with a twelve-page application form, including a reflection about the video you submitted. The reflection discusses things like: what were your lesson goals, what pre-knowledge the students had, how successful you were in meeting your goals, and so on. I submitted my application and it was reviewed by a

state panel that selects the finalists. In the year when I applied, they selected three mathematics finalists and two finalists in science. After the finalists were selected, we ended up waiting two years until the winners were announced. The winners are selected from 7-12 grade mathematics teachers or elementary teachers, alternating every year.

In your opinion, how did your application stand out from all the other applications?

I think a lot of what they are looking for is your reflection on your practice: identifying the strengths and weaknesses of what you have done and where you would go from there. In addition, you submit a resume and they are looking for applicants who have been leaders at the state or national levels. One of the criteria is how you helped the profession beyond the classroom.

How did you find out that you had won the award?

Prior to the announcement, there were some indicators that it might happen: they run background checks on a number of finalists and I felt it couldn't have been a bad sign that they did one for me. Then, there was an e-mail in which they asked me to submit a bio and a picture for the website. The official announcement came later, by e-mail.

What was your reaction when you found out that you were the winner?

After all that time, it seemed surreal. I was very excited and had to quickly make decisions because, within a month, we were to go to Washington, DC for a week. My husband and I had to arrange our schedules and decide whether or not to take the kids with us. We ended up not taking the kids with us, which I think was a good decision because I was busy the whole time. Then there were other things like the dress code: I had to figure out what the dress code was and what I was

going to wear. But, overall, there was a lot of excitement and thankfulness for this opportunity to be honored.

How did your colleagues and students react when they found out?

It was over the summer, so it was a little harder to get some of that reaction, but there were a number of people, including professors from UNI, who called or e-mailed me right away, which was nice. I also had a few former students, that I had not seen or heard from in years, who e-mailed me to congratulate me.

What impact has winning this award made so far on your career?

One area in which it made a big impact is my thinking about being a leader within my school district and state. It gave me a lot more confidence and a push in the direction of taking on more leadership roles. That was one thing that they talked about when we were in Washington, DC: a need for leadership from us in recruitment and retention, sharing with more teachers what helped us qualify for this award and spreading the message.

How was the meeting in Washington, DC, with President Obama?

It was great! We spent the morning behind the gates, in the executive office building, talking to some of the President's advisors. They were trying to get insight from us on the things we had seen that have helped with the teacher recruitment and retention. Then they said: "Okay, now we are going to head over to the White House." We walked out one of the side doors of the building, across the lawn, in the front door of the White House. They recently changed the rules, and now you can take pictures in the White House. There was a period of time when we were all let loose to take pictures with our phone cameras all over the White House. After a while, they had us all arranged in height order for a big picture - I got to be in front, because I am short. Then they said: "The next person who walks through that door will be the President. You don't need to stand, but if you feel moved to stand, that often happens." While we were waiting they brought us these glasses of water on serving trays. Then the door opened, his head pops through, and everybody jumps to their feet spontaneously and starts applauding. He gave a nice speech about how we need high quality math

and science teachers, at all grade levels, throughout the United States. He said: "we need to clone you and get more teachers out there that are like you" and everybody joked that they had given us glasses of water in order to collect our DNA. Then we all got our chance to shake the President's hand. We went in order, telling the President our names and the states we were from. When I got my moment I said "Allysen Lovstuen, from Decorah, Iowa" because I know he had been there before and he said "Ah, I love Decorah!"

"It gave me a lot more confidence and a push in the direction of taking on more leadership roles."

What prompted you to go visit the field experience today?

It has been a long time since I was at UNI and did my own field experience. At that time, UNI still had the Price Lab School and a component of that experience was done at the Price Lab School. Since then I have been involved with Luther College, the private college in town. Luther College has had students do a J-term experience, when they spend the month of January in classrooms. I had students from there (and from Iowa State) in my classroom and I wanted to see what UNI is doing. So I thought it would be interesting to see and compare how UNI is doing it now. It was nice to be able to see students in classrooms with teachers and how they interacted.

Do you notice any differences among the three colleges (UNI, Luther College, Iowa State) in terms of teacher preparation?

I talked about this with Megan Balong today and I think there are definitely differences based on numbers of students in programs and the ability to cater to groups of students. For instance, at Luther College if you want to be in math education, you must be a math major and need to take certain general education courses, one of which is a math methods course. So that one course talks about teaching mathematics, whereas at UNI there are multiple mathematics methods courses.

When you recall your first year of teaching, after graduating from UNI, did you feel you were ready to go in the classroom?

I had a very unique experience during that first year. The superintendent of the district I was hired in had one math opening left for the current year but knew that two of the teachers retiring were each going to teach for one more semester. So he knew he would have an opening the following year. After I and another applicant interviewed, he decided to hire both of us full time for the one position so he would not need to re-interview and hire again the following year. During my first year of teaching, half of my time was prep time, which made that first year to be so much more manageable. The thing I was least prepared for was the paperwork side of things: grading homework, getting it out, late work. But I don't know if there is a better way to prepare for this other than being in there.

What do you enjoy most about teaching?

The interaction with the students. My favorite moments are when I can stand in the middle of my classroom and hear students debating about math all around me because then I know that they are thinking about what is happening and why.

What advice would you give our students who are getting ready to graduate?

For new teachers, one of the most important things is to find people in your community to build you up, to get advice from, to continue learning from. Throughout your career, try to surround yourself with people who want to continue to improve, learn, and grow in the profession. They don't need to teach the same students you do, or the same subject you do. There are lots of commonalities across education and you can learn and grow from and with people throughout.

Student Spotlight



Jesse Moeller

Jesse Moeller (B.A. Mathematics '14, M.A. Mathematics '16) came to UNI in 2011 from his hometown of Davenport, IA. He completed his undergraduate degree in three years, which is all the more surprising since he was very active in UNI student campus life and student department life activities throughout his years at UNI. He participated in a number of mathematics competitions, including several rounds of the annual William Lowell Putnam Mathematical Competition and the annual Iowa Collegiate Mathematics Competition; he was a member of the UNI Men's Glee Club, UNI Freethinkers and Inquirers, and the Math Club. In the summer following his junior year, Jesse participated in a two-month mathematics Research Experience for Undergraduates (REU) at the University of Connecticut. He and one of his teammates presented the results of their work at the University of Massachusetts at Amherst and at the 2013 Young Mathematicians Conference in Columbus, OH. He also presented his work to the department in a department colloquium.

Given this background and Jesse's passion for research, it is perhaps not surprising that, as a graduate student, he chose to pursue the thesis option of the M.A. degree program in mathematics. He wrote a fine thesis under the supervision of Dr. Mupasiri titled, "Some convergence properties of Minkowski functionals given by polytopes". Jesse is currently enrolled in the Ph.D. program in mathematics at the University of Nebraska at Lincoln (UNL). We have every confidence he will complete his Ph.D. degree at UNL.

We recently asked Jesse to reflect on his experiences as a student at UNI by answering a number of questions. The questions we asked him and his answers to them follow.

When did you decide to major in mathematics?

After taking Dynamical Systems and Chaos Theory in 2011, I was convinced that mathematics was much more than calculus exercises. I decided then to major in pure mathematics.

What are the main reasons you chose UNI over other colleges and universities?

I chose UNI for a few reasons. First, I wanted to get a good education and I knew I could get it at UNI. Second, the class sizes were small. Third, it was close to home and I had no intention of leaving Iowa.

What were your first impressions of UNI?

One of the first things I noticed about UNI was the quality of the Liberal Arts Core. Adding a bit of color to my mathematical life, my liberal arts core classes never failed to occupy my mind in a positive way. I enjoyed discussing the ideas that I encountered in my liberal arts courses with my friends in the Student Union and with classmates to pass time. After taking sociology, philosophy, medical ethics, and the humanities, I feel now much more culturally aware than I was when I left high school.

Is there any course in our department that you feel has made a significant impact on your growth as a mathematician?

Advanced Calculus 1, previously known as Intermediate Analysis 1, was an important course for me. The text that is frequently employed is very readable and helped me to understand logic and proofs. Beyond that, the willingness of our faculty to provide courses has also been a great help. Olena Ostapyuk, Theron Hitchman, Adrienne Stanley, and Douglas Mupasiri all gave of their time so that graduate students could take challenging courses that weren't originally part of the curriculum.

Do you have any particularly memorable experiences at UNI?

Firstly, I have never felt more accomplished than when I defended my Master's thesis to my peers and my thesis committee. I was honored that so many of my peers and fellow students attended the presentation. It was this event in addition to all of the hours that we shared previously that helped me to realize that mathematics is not meant to be done in isolation; wherever I go, I want a mathematical community. Secondly, it would be hard to separate my experience at UNI from the experi-

ences that I have had in student organizations. My participation in Men's Glee Club and the UNI Freethinkers and Inquirers have elevated my college experience wholly. The rewards for participating in these groups are still shaping my life; I have made lasting friendships, I am more musically experienced, I met my future wife, and my political mind is sharper.

Was there a particular moment during your years as a student at UNI that stands out as an important learning experience and perhaps convinced you to pursue a major in mathematics?

Working with Theron Hitchman, although my own accomplishments during the time were few, made me realize that I was capable of becoming a mathematician. Although I wasn't capable of writing proofs at the time, I did discover some counterexamples to our original naive conjecture. My experience in Connecticut was similar.

What kind of mathematician do you aspire to be?

I would say that I aspire to be a communal mathematician. I want to improve public understanding of mathematics: through my own research and related contributions, through teaching, through fostering a culture of inquiry, and through promoting undergraduate research later in my career. I will be doing some back-tracking at UNL, although I am sure I will have new experiences regardless. I am wary of trying to begin where I left off at UNI, and I think it will be important to connect with the students who will be in my classes for the next 4 to 5 years.

What do you enjoy doing in your free time?

I have a large range of interests and I am mediocre at a great number of things. I enjoy singing, camping, hiking, developing and playing video games, playing card games, and lifting weights.

Student Spotlight



Lindsey Peterson

Lindsey came to UNI in 2012 to pursue a business teaching degree. She chose UNI primarily due to the reputation of our teaching programs. Says Lindsey: "Since I was going into business teaching, it seemed like the obvious choice and I didn't seriously consider any other universities. With that said, I think that UNI has a feeling that sets it apart from other universities; the campus is large enough to provide fantastic opportunities, but small enough that you become very close with your classmates and professors."

However, it did not take her long to realize that she was not enjoying the communicative aspects of her major. During her first semester, Lindsey took Principles of Macroeconomics, a class which she thoroughly enjoyed and which ultimately reinforced her decision to switch to a non-teaching major. As she was researching the Applied Economic Analysis major, she learned that this would be a good choice in combination with a major in Actuarial Science. Since she was planning on getting at least a minor in mathematics, about half-way through her first semester at UNI Lindsey dropped her business teaching major and became a double major in Actuarial Science and Applied Economic Analysis. Later she also declared a minor in Finance. "When I first declared my majors, I had every intention of working as an economist rather than an actuary" says Lindsey. "At that point, I saw the actuarial profession as more of a fall back than my career path. But, as I took classes, I realized how much I loved the type of work that actuaries get to do; they basically solve mathematics puzzles on a daily basis."

All the actuarial science courses are important, but Lindsey feels that the class that made the most significant impact for her was Loss Models

because its content relates directly to her first position and to the property and casualty field in general. When asked to name a course in our program that she found challenging, Lindsey said: "I struggled the most with the Actuarial Mathematics class, which focuses on life contingencies. I mostly didn't have the interest for the content, which is partially what pushed me in the property and casualty direction." (The reader should note that Lindsey got an A in that class.)

Lindsey has been active and has even assumed leadership roles in several student organizations, including the UNI Actuarial Club, Beta Gamma Sigma, and Kappa Mu Epsilon. Most recently, during her senior year, she served as a co-president of the Actuarial Club and treasurer of Kappa Mu Epsilon. According to Lindsey, the Actuarial Club offers excellent networking opportunities for all actuarial science majors: "The club brings in approximately ten actuarial companies each year that are looking to hire interns for the summer. No matter what year you are or how many exams you've passed, attending the meetings is the best way to get your foot in the door at these companies and acquire an internship."

"...as I took classes, I realized how much I loved the type of work that actuaries get to do; they basically solve mathematics puzzles on a daily basis."

While a student in our program, Lindsey participated in two internships: she was a data analysis intern at the CBE Companies in the spring of 2013 and a commercial lines research and development intern at Nationwide Insurance during the summer of 2015. She found both internships to have been very important in her development as an actuary: "During these internships, I learned most of the computer skills, especially SAS and Excel, that I will use on a daily basis in my career. An internship also helps you see what an actuary really does. The content we learn in the classroom matches what is required for certification, but that content is just the foundation of the actuarial profession" says Lindsey.

Lindsey passed three actuarial exams prior to her graduation from UNI and plans to take a fourth one this fall. "The challenging aspect of the exams I have taken was setting aside time to study. Taking an exam requires a lot of preparation, even with the content coverage the UNI program provides. My success came from doing as many practice problems as possible before the exam; the practice problems closely resemble what you will see on the exams and ensure that you will know the process for any exam question you see during the sitting."

Lindsey graduated from UNI this past May, Summa Cum Laude. She was on the Dean's list every semester she was a student at UNI and is this year's winner of the Purple and Old Gold Award in Mathematics. "I had heard about the Purple and Old Gold award during one of my visits to UNI. Since then, it has been a goal that stuck with me all four years. I was elated and honored to receive this award."

Shortly after her graduation, Lindsey started in her first full-time position as an Analyst on the Commercial Lines Research and Development team at Nationwide Insurance. "I will be helping develop the first cross-platform BOP (Business Owners Package) model that uses data from all of Nationwide's smaller companies. The finished model should help the rest of the commercial lines pricing team make more refined quotes. I am a little nervous to get started because it's different to use real data that affect a real business rather than working problems that have no consequences if you make an error" says Lindsey. She is determined to continue her professional growth as an actuary and hopes to achieve the Fellow of the Casualty Actuarial Society (FCAS) credential in the next five years.

One aspect of her profession that Lindsey enjoys is the multitude of opportunities it offers: "I like the career flexibility of an actuary. If I get bored working the commercial lines predictive modeling realm, I will have the freedom to switch to pricing, reserving, and even to personal lines without having to get extra certification."

Student Spotlight



Toby Maggert

For most of middle school and high school, Toby dreamt about becoming a mechanical engineer. However, during his high school senior year he took a college engineering class which made him reconsider his career options. Since he enjoyed tutoring, and mathematics was by far his favorite subject, his choice was then obvious to him: he decided to become a mathematics teacher.

Toby came to UNI in fall of 2013 to pursue a BA in secondary mathematics teaching and later added a minor in statistics. Says Toby: "Once I decided to be a mathematics education major, UNI was the clear choice. The University of Northern Iowa has the most prestigious education college in the entire Midwest. I came here on my college visit and decided that this was where I wanted to attend college."

Taking 2.5 years of college level mathematics courses in high school helped Toby to hit the ground running at UNI. For instance, a challenging course like Calculus I (which he took in high school) required Toby to revise his study habits: "I had never put in any significant time preparing for class and tests before, but I was often spending an hour each day working on calculus in high school. While the extra time spent was a new adjustment, I thoroughly enjoyed the higher level challenge and quickly grew accustomed to the faster material," says Toby.

At UNI, the Discrete and Argumentative Mathematics class has left a lasting impression on him: "In this class I was introduced to formal proofs and how to write them. This marked the beginning of my abilities to critically think about a problem in a mathematical context and work to solve the problem. I had to think

about every way it could be misinterpreted or any technicalities that needed to be covered. I then had to present my proofs to my classmates in a clear and concise manner. In this way, I feel that I developed both as a mathematician and as an educator."

It is perhaps not a coincidence that one of Toby's favorite memories so far is also related to the Discrete and Argumentative Mathematics class: "Before a number of my classes, a few of my classmates and I would often play "Set." This is a game introduced to us by Dr. Adrienne Stanley and which consists of quickly finding relationships between different cards. This game has found its way into many of the math classrooms and has given me a lot of enjoyment."

Toby aspires to be a "high energy teacher who will teach higher level mathematics courses." He would particularly like to teach Algebra II, Trigonometry, and even Calculus. "I enjoy the more advanced material and having students with more mathematical tools at their disposal would be fun because they can be pushed to work through problems. I can see far more interaction with my students in the advanced classes," says Toby.

In addition to learning new mathematical concepts and ideas, Toby is fully aware of the importance of field experiences for soon-to-be teachers: "One of the most important ways in which my field experience has developed me as a future educator is the practice. Spending numerous hours in the classroom is exactly what I needed to continue my development. One particular moment that I found challenging was a moment when a girl was seeing way ahead in my lesson. She was already thinking about material that we would not be covering until the following week and she was asking questions about the efficiency of the method I was teaching. I had no answer prepared for a student so mathematically inclined, which reminded me that I had to tailor instruction for all students, including the more advanced ones."

Through the UNI teacher education program, Toby received training and certification in several areas including violence prevention and child abuse. "The Mentor in Violence Prevention certification is a weekend long program put on by Alan Heisterkamp and is open to the public. The certification is all about different ways that one can prevent and defuse

hostile situations. I found this course particularly motivating. Learning all the ways in which I can create a comfortable environment for everybody was awesome. I would recommend this training to anybody who would like to learn some professional skills in this area."

Toby is active and assumed leadership roles in several student organizations including Kappa Mu Epsilon, where he serves as a treasurer, and the Sigma Phi Epsilon Fraternity, where he serves as a chaplain and sound body chairman, in addition to other roles. He is also a vice-president and social chairman of the UNI Men's Rugby Club. He volunteers for the Boys and Girls Club and participates in the Big Brother Big Sister program: "I was paired up with a little boy at the middle of my sophomore year. I have been meeting with him almost every week since we were matched. I go to his school during his lunch and recess hours and we spend time together. If he needs to get caught up on homework, we do that, but since he almost always has his work done, we get to do other activities. We often go to the library or the gym, make up some type of game and add new rules as we go. I am there to be a steady adult in his life and to give him any support that he might need. Getting to spend time with him is one of the highlights of my week" says Toby.

When we asked Toby what he does during his free time, Toby answered: "I am a self-proclaimed nerd. I love solving Rubik's cubes, playing video games, and watching Marvel movies or reading comics. I have recently started playing the guitar and have been an avid rock climber at the UNI Wellness and Recreation Center since my freshman year. I have also just started slack lining a lot, and hanging out with all my friends is always fun."

Student Spotlight



Julie Kirkpatrick

When did you decide to become a mathematics teaching major and what made you pick this major?

I decided I wanted to go into teaching when I was in high school. I was a student leader for a lot of different organizations, and the teaching component of those positions really appealed to me. I thought about teaching music for a short time before switching my focus to mathematics. I'm a much better mathematician than a musician. While I am passionate about both fields, mathematics speaks to me. I often say "There is only one better feeling than understanding a mathematics concept: helping someone understand a mathematics concept."

What are the main reasons why you chose UNI over other colleges and universities?

I knew that I wanted to be a teacher and go to a public university. UNI is clearly the best option for going into education in the state. I attended Math Day as a senior in high school, and UNI's math department seemed very rigorous but friendly. I knew I could get a great education from this institution. The Panther Marching Band was another big factor. I really loved marching band in high school, and I wanted to continue in college. UNI had all the right things I wanted in my college experience.

What were your first impressions about UNI?

UNI has always seemed like a friendly place where the professors and community want to help students succeed. In my time here, this statement has held true. I have always felt supported by my instructors and advisors. I've gotten great life advice from mentors and peers alike. I was a little worried coming to UNI because I didn't think that it would provide similar opportunities as a large state school. However, I have gotten to experience so many things as a UNI student that

have shaped my life: I marched with the band in London in the London New Year's Parade. I helped create a local foods program that now supplies fresh local foods at affordable prices in low income neighborhoods and employs local youth. I discovered new results in knot theory through undergraduate research.

How did you make the transition from high school level to college level mathematics?

Honestly, the transition wasn't a very difficult one. I am lucky to come from a great secondary mathematics program that adequately prepares students for college level mathematics. I think the biggest difference has been the amount of time I spend on problems. I've definitely spent hours on one problem in my higher level classes. I've had to learn mathematical perseverance.

Are there any courses in our department that have made a significant impact on your growth as a mathematician and future teacher?

All the methods courses have impacted me. Thinking about mathematics as a teacher is a very different experience than thinking about mathematics as a student. A non-methods class that impacted me was Dr. Hitchman's Euclidean Geometry. Inquiry and argumentation are great tools of learning, and his class really plays off of these ideas. I know I want these ideas to be the focus of my future classroom, so having a great example of how an inquiry-based classroom runs is very beneficial to me.

Do you have any memorable experiences at UNI?

I sort of answered this at the end of a previous question, but to add to that list: I have a great group of math teaching friends who are in my classes consistently. We all support each other and have great conversations about math, teaching, and everything else. I've also been very fortunate to be on the Dean's List for all my semesters of college.

What role do you think your field experiences play in your development as a future teacher? Is there any particular moment during a field experience that you think was an important learning experience?

As much as methods courses can teach someone, there is no substitute for real world field experiences. I have gained so much perspective from my field experiences, especially in terms of connecting to students and lesson planning. The most memorable teaching moment I've had was in level two field experience when I was giving

my own lesson where the students were not used to using an exploration to complete tasks. I had to motivate the students to be involved in a way they were not accustomed to. At the end of the lesson, almost all the students were engaged in the exploration and seemed to enjoy the lesson. This taught me that even though students might be ingrained in a traditional lesson structure, they can adapt to a more student-led approach if guided to do so.

What kind of teacher do you aspire to be and what courses do you think you will particularly enjoy teaching?

There are various traits of all my math professors I've had here that I want to take with me. Overall, I think the three adjectives I want to be described as are caring, engaging, and knowledgeable. I think I will really enjoy teaching higher level high school courses like Calculus and Trigonometry. Those courses were my favorite to learn in high school, and I have some good ideas on how to teach the key concepts. I would love to teach a computer programming class as well. Programming is such a useful skill and I think all students should learn it in their elementary or secondary years.

This summer you participated in a Research Experience for Undergraduates (REU). Can you give us a few details about this program?

The REU I participated in was held at Illinois State University under the direction of Dr. Saad El-Zanati, Ryan Bunge, Dr. David Barker, and Dr. Dan Roberts. It was a program specifically designed for secondary mathematics education majors. We focused on various open graph theory problems and how research environments and open problems can be used in high school mathematics classrooms. We hosted a math camp for Chicago public school students for a week in late July. It's been really interesting to have a dual focus on difficult mathematics and applied pedagogy. Usually those topics stay separated in course work, so it was nice to experience the connections between the two.

What do you enjoy doing in your free time?

I usually don't have a lot of free time, but when I do I like to read, craft, play with my cat, or just take a nap. I also really enjoy doing yoga and going camping with friends.

Donor Spotlight

Robert R. Johnson



Robert (Bob) grew up on a dairy/poultry farm in Cortland County, New York, and was a very active 4-H'er. In 1957, after graduating from Marathon Central High School, he attended Syracuse University to pursue a bachelor's degree in engineering. At the end of his freshman year, having used all of his scholarship funds, Bob transferred to SUNY Cortland and changed his major to Mathematics and Science. He graduated from SUNY Cortland in 1962 with a Bachelor's of Science degree with a double major in Mathematics and Science, and a teaching certificate for secondary mathematics and science.

After graduation, Bob started his teaching career right away. He first taught junior high mathematics in Greene, NY, then high school mathematics in Groton, NY. In September 1965 he came to UNI to participate in a National Science Foundation Academic-Year Institute which led to Bob earning a master's degree in Mathematics from our department in 1966. He returned to New York where he spent one year as a mathematics instructor at SUNY Cortland.

In 1967 Bob embarked on a 33-year long professional journey as a faculty member of the Mathematics Department at Monroe Community College (MCC) in Rochester, NY. Between 1979 and 1982 he served as Department Chair for 35 full-time and over 75 part-time faculty members. At MCC he was a highly successful teacher and taught 22 of the 26

courses offered by his department. As a teacher, he developed a strong interest in statistics education which became his passion and led him to take additional courses in statistics at the Rochester Institute for Technology and the University of Iowa.

Back in the sixties, most introductory statistics textbooks were loaded with artificial "widgets being produced by ABC Company" examples - one of his pet peeves with textbooks. Bob was a firm believer that students would relate more easily to real-world examples and thus gain a better understanding of statistics. That led him to write a new textbook, *Elementary Statistics*, which stood out from the rest through its intuitive approach and meaningful examples using everyday applications. The first edition of his textbook was published by Duxbury Press in 1972. Over the next four decades, the textbook was updated in ten additional editions, most recently in 2011, and was translated and published in two other languages. Four additional versions of *Elementary Statistics* were also published by Duxbury Press, starting in 1980.

Bob recalls that, in 1996, while attending one of the New York State mathematics teachers meetings, he participated in a session about the role of Minitab in the teaching of introductory statistics. The session was followed by a lengthy and lively discussion amongst the participants and presenter about not only the role of Minitab but other technologies. The "overtime" session lasted for over an hour with nearly everyone staying. That discussion made him realize that statistics instructors would benefit greatly from a conference that focused solely on the teaching of the introductory statistics course. He pitched the idea to his MCC colleagues and administrators and received their support to organize, together with a few colleagues, a two-day conference.

And thus, *Beyond The Formula*, a two-day conference for teachers teaching introductory statistics, was born - the first meeting took place in 1997. The mission of the conference was "to promote excellence in the teaching of introductory statistics by presenting the latest developments in teaching to those faculty teaching introductory statistics

at four-year colleges, two-year colleges and high schools." The conference was a huge success and became an annual event until its final meeting in 2005. Its nine meetings helped to reshape the way a large number of statistics educators taught statistics. The conference was succeeded by other similar events which drew inspiration from it.

Bob and his wife Barbara created the Robert R. Johnson Endowed Scholarship for Mathematics, to provide financial support to outstanding UNI secondary mathematics teaching majors. Says Bob: "Being true believers in education, my wife Barbara and I believe a higher education should be attainable for all people. And, of course, financial support for students is a very important factor, for without scholarships and other forms of financial aid many prospective students would not have the opportunity to receive an education. Let me share my own "wacky" history with financial aid. As the class solitarian, I received a handful of small scholarships at graduation from high school, which, along with my savings, paid the tuition at Syracuse University for one year. By transferring to SUNY Cortland where the tuition was very low, I received what I consider a "form" of financial assistance. During a recent move, I found the receipt for my first semester at Cortland; it was for the grand total of \$0.00. "That's as good as a tuition scholarship can get!" Low tuition bills at Cortland were the financial salvation I needed. When it was time to go back to college for a Master's degree, I was selected to attend a NSF-AYI hosted here at Cedar Falls. It covered the cost of tuition, books and included a living allowance. Again "financial aid", just a different form. Therefore, I can honestly say that without lots of financial aid along the way, I probably would never have completed my education. Having received a good education at each institution and having had a successful professional career, it is now our turn to return some of those financial favors."

Bob retired from Monroe Community College in 2000. He and his wife Barbara, whom he met in 1988, have been married for 27 happy years. Between them, Bob and Barbara have 8 children, 22 grandchildren, and 2 great grandchildren.

Contributions to an Account – Recognition*

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Department of Mathematics
University of Northern Iowa

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