

Know Your Wisconsin Mathematician

Interview with Clare Hemenway, UW-Stevens Point at Wausau, by Benjamin V.C. Collins



Where did you grow up and where did you go to undergraduate school?

I grew up in Worcester, Massachusetts, in a neighborhood which was within walking distance of four well-respected colleges and universities. I graduated from Clark University, where I was one of very few commuting students. The campus was located just two blocks from my home, so I guess you could say I took the concept of neighborhood education to the extreme.

What about graduate school?

I ventured further for graduate school—I attended the University of Virginia in Charlottesville, Virginia where I studied Representation Theory of Algebraic Groups from a combinatorics perspective.

When did you decide that mathematics was what you wanted to do with your life?

I was top tracked in high school, but I entered with a deficit in formal algebra education. I remember taking a standardized test my first day in my high school math class and scoring the lowest out of the 45 students in my classroom. (I remember saying to myself how do I identify a parabola if I do not know what one is). My teacher started the class about halfway through the book. I had to pick up the missed material on my own. While this could have been devastating, I devoured the material—I particularly remember struggling with concepts such as abstract binary options (my K-12 math education was completely “new math” and it was taught properly) and I remember my “eureka” moment when I finally “got it.” And I did it on my own! The other “aha” moments that I readily recall from high school were when I was able to get to the understanding of ideas again through concentrated thought on my own. (I guess I could be a poster person for the benefits of productive struggle). I just loved the beautiful logic and reasoning behind mathematical concepts, and I loved abstraction. (Just a side note: At the end of my first year in high school, my class retook that same test and I scored the highest in the class).

I started college with an intended major in biology. But I disliked laboratory work and still loved theory, so I studied Mathematics and Computer Science (back in the day of huge mainframes and punched cards). I had to make a choice between these two fields for further study, and I chose mathematics because I continued to love the beauty, logic, and theory.

What was the influence of your family on your education?

Both my parents graduated from College in 1935. My mom was a great speaker, writer, and grammarian and my dad was an engineer who loved mathematics. My parents encouraged all in my family to pursue a college education as a springboard to further our knowledge of the world

As a high school student, I would sometimes ask my dad for help with my math homework. I was so impressed that he would take the time to read my book to understand my question and the math behind it. But I was even more impressed with his explanations—he would take straightforward algebra problems and somehow come up with solutions from a geometric perspective. I learned there were different, equally valid methods to solve problems. As a kid, I took this for granted - I assumed everyone had a parent who found it exciting to work on math problems.

Are there any teachers who had influenced you to become a mathematician?

The first was my high school teacher **Sister Donald Marie** who taught me two years of high school algebra and Calculus I and II. At the time she was taking graduate courses in Mathematics and would inform us about topics she was studying. As a senior, she suggested that I should consider a mathematics major in college. I told her that I did not think I was “good enough.” I mentioned that I could produce proofs on my own, but that these proofs were mostly routine definition- checking proofs and were the same proofs you could find in books. I told her that I did not think I could construct original and creative proofs. Her response had a great impact on me. She told me that every time I construct a proof on my own, even of well-known facts, that this was indeed creativity and original work. She reinforced that once I constructed a proof, then I owned it and that was my accomplishment.

Like many of our students, I wage a constant struggle with confidence in my abilities. I never would have considered pursuing graduate studies in mathematics if one of my college professors did not strongly encourage it. He was **Dr. Ed Cline** and I took several courses from him, including a graduate course in Abstract Algebra. He helped me with the application process by suggesting several graduate programs. I also remembered that he always gave us two grades on our assignments—one was for the solution and the other was for the style and exposition of our solution. I appreciated this as it bolstered my passion for elegant mathematical expression.

How did you end up at UW Stevens Point at Wausau?

My first job out of graduate school was a temporary position at Carleton College in Minnesota. After two years there, I taught at Bates college in Maine. Unfortunately, I did not complete my dissertation, and so I sought an academic position for which that was not required. This brought me to UW Marathon County in the two-year transfer institutions known as the UW Colleges. I truly enjoy being here as I think I have great impact on my students. A few years ago, the UW Colleges were eliminated, and my campus was integrated into the UW Stevens Point campus. While wary at first, my fears soon disappeared as the UWSP campus and math department has been very welcoming and supportive and the change has been very good for our small campus and for me personally.

What have your students meant to you as a teacher and mathematician?

When a student asks a question (often in the form of “can you do a certain exercise”), I usually probe the student before answering—what confused or scared you about this problem or how is this problem different from the others. Then we work together to try and come to an understanding of the solution. Teaching and learning are two-way streets: I learn from my students and my students learn from me. I often get to a deeper learning of concepts from my student’s questions and this makes me both a better teacher and mathematician.

What courses do you like to teach?

I currently enjoy teaching Statistics, Calculus I and II, and Linear Algebra. When I was at Bates College, I loved teaching Introduction to Abstraction, Complex Variables, and Abstract Algebra.

How have you found that teaching of mathematics has changed over the years?

Okay, this is a loaded question during these pandemic times. And I could write much about the technology learning curve I am currently scaling. I am not going to talk about specific changes during this past year, but I do wonder what the permanent changes may be. Will there be more of a shift to online and hybrid learning? Will most courses be offered so that students can take them in different modalities? Time will tell.

But while technology had been integrated into teaching before the pandemic, the goals of teaching mathematics concepts has not changed. In recent years, there has been a shift to student-centered active learning with group work. And actually, technology tools can provide more support for group work than what can be accomplished in a face to face classroom (particularly if socially distanced).

But whatever the modality, methods, or tools, the objective of teaching mathematics is to foster a deep understanding of mathematics in our students.

How have you been you involved with the MAA?

I have been involved with the MAA since my arrival in Wisconsin approximately 30 years ago. I have attended most of the MAA Wisconsin Spring Meetings and I have presented at some. I was the local host for the Spring Meeting when it was at UW Marathon County. I served a three-year term on the MAA Wisconsin Executive Board as Chair Elect-Chair-Past Chair and just recently finished another three-year stint on the MAA Wisconsin Executive Board as the first MAA Wisconsin Section Representative to the national MAA Congress. I was elected to serve on the Elections Committee of the MAA Congress and I am currently a member of the national MAA Committee for the Undergraduate Teaching of Mathematics.

What do you think is the best part of being a mathematician?

Sharing mathematical and pedagogical ideas with my colleagues.

What is the worst part of teaching mathematics?

Many of our students lead complicated lives and for me the worst part of teaching is many times failing to successfully motivate students to keep up with their coursework amidst their challenges.

How do you describe what you do when you are talking to somebody outside of mathematics?

I tell them that mathematics is more than numbers and facts; it is ideas and abstraction.

What of your work do you like the best? What are you most proud of?

The best part of my job is teaching, and it is what I am most proud of.

What is your advice to college students and new teachers?

To College Students: Try new things; occasionally experiment with something out of your comfort level-you may discover a new passion or talent; think outside the box; do not be afraid to risk failure even in giving it your all.

To New Teachers: Try new things, occasionally experiment with something out of your comfort level-you may discover a new passion or talent; think outside the box; do not be afraid to risk failure even in giving it your all.

Who is a Wisconsin Mathematician that you would like to know? Send suggestions for the next KYWM to Anthony Van Groningen, vangroningen@msoe.edu .
