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Keynote Presentations

Promoting Quantitative Literacy—Institutional Transformation in the Context of Interdisciplinary STEM Partnerships

Susan Ganter, Embry-Riddle Aeronautical University

Abstract

The National Consortium for Synergistic Undergraduate Mathematics via Multi-institutional Interdisciplinary Teaching Partnerships (SUMMIT-P) has been working since 2016 to revise and improve the undergraduate mathematics curriculum to address the persistent problem that students are unable to apply skills and content from mathematics classes to courses in both STEM and non-STEM fields. SUMMIT-P has gained significant experience implementing, studying, and disseminating the use of interdisciplinary and inter-institutional faculty partnerships to erode disciplinary silos. This work has resulted in the creation of substantive collaborations that culminate in lasting curricular change in the first two years of mathematics and in the partner disciplines served, creating an undergraduate curriculum—from mathematics to partner discipline—that is cohesive and seamless for students. Components of SUMMIT-P's work have been used to initiate an intervention model that has resulted in curricular change in a wide variety of institutional contexts. The 12 participating institutions benefit from being part of the consortium through campus site visits; use of common protocols; extensive mentoring opportunities; professional development; use of Descriptive Consultancy and Success Analysis protocols; collection of multi-institutional data; and momentum as a consortium that has fostered accountability and a wide variety of dissemination outlets. SUMMIT-P is an important step toward understanding institutional transformation on a large scale that will support the mathematical development of STEM majors while increasing mathematical literacy among all college graduates. The SUMMIT-P consortium has experienced great success with collaborative processes, resulting in ongoing partnerships across many disciplines and institutions. During this presentation, we will discuss how such partnerships help to immediately reinforce mathematical concepts in a variety of disciplinary settings, creating context across courses.

Beyond Statistical Significance: A Holistic View of What Makes a Research Finding “Important”

Jane E. Miller, Rutgers University

Abstract

Students often believe that statistical significance is the *only* determinant of whether a numeric result is “important.” I start with a brief review of hypothesis testing, then discuss what questions inferential statistics can and cannot answer, including statistical significance, causality, causal order, direction of association, practical importance, whether the independent variable is modifiable, and generalizability of the results. I then describe factors that determine each of those aspects of “importance,” including study design, measurement, and context. I illustrate these issues with examples from a study of the association between the amount of time teenagers spent playing video games and time spent on other activities.

Facilitated Discussions and Workshops**Openly-available Materials for a Gateway Quantitative Reasoning Course, with Optional Corequisite Support Resource****Stephanie Andrews, Lone Star College-Kingwood****Connie Richardson, Charles A. Dana Center at The University of Texas at Austin****Abstract**

Come experience the Dana Center's updated Quantitative Reasoning course, now openly available for classroom use. Explore the active and collaborative way in which students become engaged in essential mathematics and statistics content in relevant and authentic contexts. This course is used most often as the math requirement for liberal and fine arts majors and other less algebraically intensive programs. The lead presenter has used the QR course and the corequisite course successfully for several years (including pre-pandemic) both in-person and asynchronously online. She will actively engage participants in a complete lesson cycle including corequisite support content, preview assignment, in-class lesson, and practice assignment. In doing so, she will not only demonstrate this course, but also model strategies that faculty participants can use with their own courses to develop students' learning strategies and conceptual understanding.

The Rest of the Story: A Novel Approach for Measuring Students' Perceptions of QR's Value**Ruby Daniels****Kathryn Appenzeller Knowles, Texas A&M University-San Antonio****Abstract**

While extensive literature documents the importance of quantitative reasoning (QR) in academic, professional, and personal domains, students often fail to recognize its value. Many tend to have a myopic focus on assignment completion, rather than development of lifelong skills. In this facilitated session, we borrow best practices from the marketing discipline to learn about a novel, engaging, and scalable way to measure perceptions of QR value. Session participants will hear organic student testimonials about its importance in their lives. Attendees will then break into small groups to discuss best practices for helping students appreciate the value of QR.

Problem Based Learning: Techniques for Applying Data Literacy Skills to a Social-Justice Problem**Debasmita Basu,****Carol J. Overby****Bethany Graburn, The New School****Abstract**

Since its development for medical education in the 1980s, Problem Based Learning (PBL) has used complex real-world problems to facilitate students' gaining a deeper understanding of concepts and principles. The Quantitative Reasoning I course at The New School applies PBL to the problem of inadequate wages worldwide, exploring correlations between higher minimum wages and measures of well-being. In this session, we will guide attendees through the same problem. They will experience firsthand how being assigned the role of problem solver creates a natural platform for students to engage with concepts in a tangible way; an engagement that is enriched by the social-justice nature of the problem of inadequate wages.

Counts, Relative Frequencies and Percentages: Connecting Mathematics to the World**Gail Burrill, Michigan State University****Abstract**

Mathematics and statistics can be used to describe, explore, and understand our complicated world, but often seemingly simple components of the work, such as the difference between counts and relative frequencies, lead to confusion. In this session, we'll discuss the importance of building robust conceptual understanding of basic numerical representations and work through several questions related to real-world scenarios, from exploring the gender wage gap to rating sports figures, considering relevant data and strategies for transforming the data in order to answer the questions

What Do We Actually Assess When We "Measure" QR Skills?**Kate Follette, Amherst College****Erin Galyen, University of Arizona****Sanlyn Buxner, University of Arizona****Cat Sarosi, Amherst College****Vanesa Farooq, Amherst College****Abstract**

Gauging student competency by performance on QR assessments is not as straightforward as it may seem, as performance is not a simple measure of skill. Results from the Quantitative Reasoning for College Science (QuaRCS) study reveal that affective variables such as numerical self-efficacy and math anxiety level have a strong influence on student performance, and that gaps in affect according to gender, race/ethnicity, and socioeconomic status are partially responsible for observed achievement gaps. At the same time, the contributing factors and effect sizes vary greatly across demographic groups. This points to the importance of addressing multiple affective domains as part of inclusive pedagogical practices. We also find marked demographic gaps in students' perception of the relevance of certain QuaRCS items to their lives, culture, and what is important to them. This cultural disconnect between the assessment items and students' lived experiences may be another contributing factor in observed achievement gaps. The strength of the relationships between student affect and performance has important implications for effective, inclusive pedagogy in QR/STEM courses, as well as accurate assessment of competency. In this facilitated discussion, we will introduce some of the affective domains that the literature suggests are related to performance on numerical skills assessments, and will lead participants in discussing both successful and unsuccessful curricular interventions around numerical affect.

QR in the News! Using Articles to Motivate and Engage Students in QR Classes**Eric Gaze, Bowdoin College****Abstract**

Using real world articles is a great way to motivate content in QR courses and engage students. Examples will be shared from the speaker's QR course over the past decade. Participants will receive handouts of take home quizzes to work on during the session. The discussion will focus on the logistics of implementing this activity in your classroom, from connecting content to articles to facilitating meaningful dialogue on hot-button issues.

Bringing Social Justice Topics into Quantitative Reasoning Classes

David Jabon

Özlem Elgün, DePaul University

Abstract

In this session, we describe how in DePaul University's Quantitative Reasoning course we attempt to integrate social justice issues into the curriculum in a non-partisan way, helping the students to think more critically. In particular, the course helps students to become more aware of appropriate normalization of data and of the importance of disaggregation of data using examples relating to social justice issues in class activities and assignments. The course also includes a substantial data analysis project which often addresses current issues related to social justice in the United States; we describe how this project is designed to promote critical thinking and discussion based on empirical inquiry and analysis. A facilitated discussion about how different Quantitative Reasoning courses integrate social justice topics and the challenges faced in doing so follows the presentation.

Workshop on How to Use *Making Sense of Numbers: Quantitative Reasoning for Social Research* as a Course Textbook

Jane E. Miller, Rutgers University

Abstract

In this 1-hour workshop, I will cover three aspects of using *Making Sense of Numbers: Quantitative Reasoning for Social Research (MS#)* as a textbook. To do justice to the entire book would require a full academic year (2-semester or 3-trimester) course that provides time for students to not only read about, but also discuss and practice, the many concepts and skills covered in the full set of 15 chapters. In the first part of the workshop, I will provide an overview of the book's content and organization, and present suggestions about which sets of chapters suit different 1-semester courses, including courses on liberal arts math, quantitative reasoning, social science research methods, basic statistics, data analysis, and communicating quantitative information. Second, I will describe the instructional devices used in the book and how to build on them in the classroom. Third, I will discuss the types of engagement activities provided at the end of each chapter, and how to use them during class or for homework assignments. There will be time at the end of the workshop for questions and discussion of these ideas.

Learn to Use Eventmath – A New Wiki for Sharing Math Lesson Plans Based on Current Events!

Brendan W. Sullivan, Emmanuel College

Greg Stanton, Higher Math Help

Abstract

The information learners encounter in the news and on social media is always changing, so our lesson plans need to change too. With grant support from the Wikimedia Foundation, we have developed a website where math educators can share and collaboratively update math lesson plans based on current events. Educators can also give and receive feedback, and browse a self-updating directory of peer-reviewed lesson plans. We call the project *Eventmath*. In this facilitated discussion, we will outline project goals and progress by introducing the website and describing how it supports the teaching of quantitative and information literacy. We will then publish a new lesson plan to the Eventmath website with help from the audience. Afterward, we will take questions and suggestions about upcoming free workshops during which attendees will make their own contributions to the site, in collaboration with peers.

Collaborating with the Humanities to Improve Quantitative Habits of Mind**Beverly L. Wood****Debra T. Bourdeau, Embry-Riddle Aeronautical University****Abstract**

We define H-STEM as “blending the study of science, technology, engineering, and mathematics with interest in, and concern for, human affairs, welfare, values, or culture.” Goals for students include an understanding of the humanities through the lens of the STEM disciplines that would not exist without human focus on the progress of society in the areas of rhetoric, literature, history, philosophy, art, religion, and ethics. Humanities, with its focus on critical thinking, cultural and information literacy, is uniquely positioned to be paired with other disciplines to create multiple lenses of inquiry. Students learn languages and methodologies commonly associated with various disciplines, both to understand their commonalities and to appreciate their differences. This session will provide multiple examples of effective blends of mathematics and the humanities for those who attempt interdisciplinary projects to expand student capacity for critical thinking and quantitative reasoning. Audience members will consider infusions, courses, and even programs that may work in their institutional contexts.

Presentations***Math for the People* Project Update****Mark Branson, Stevenson University****Whitney George, University of Wisconsin-LaCrosse****Abstract**

Math for the People is a collaborative, OER textbook aimed at first-year non-majors quantitative reasoning courses. The text approaches mathematics from the perspective of social justice, with each module focusing on a social justice topic and discussing some of the mathematics needed to engage with that topic. At last year's NNN Meeting, we announced our first call for authors. The modules those authors wrote are now in review, and we are returning to give an update on our progress and discuss opportunities to participate in the project.

Do QR Instructors Implement Student Projects With Fidelity?**Deependra Budhathoki, Ohio University****Abstract**

This presentation reports student project implementations of 13 QR instructors (4 male & 9 female) from 4 public universities and 6 public community colleges in Ohio; 9 of these institutions offered QR courses transferable across public institutions in Ohio. Though all 13 instructors incorporated projects in their QR teaching, they had many variations in their numbers of projects, associated weights, and dissemination of findings. They used 1 to 6 projects a semester accounting for 4% to 75% of student grades. Some instructors did not implement projects with proper fidelity. Their projects were similar to traditional worksheet homework assignments, limiting students' learning opportunities by working individually or in a group to solve real-world problems. Such instructors stated that they named the assignments as projects because the state agencies required it. Manytimes, the variations in project implementation occurred even due to the instructors' perceptions about projects and their institutional contexts.

We Are Teaching Numeracy – Are Students Learning? Evaluation of the Numeracy Course “Numbers for Life” at McMaster University**Andrijana Burazin, University of Toronto Mississauga****Taras Gula, George Brown College****Julie Jenkins, Queen’s University****Miroslav Lovric, McMaster University****Abstract**

In collaboration with the co-authors, Miroslav Lovric designed, and has been teaching, the numeracy course “Numbers for Life” at McMaster University. In the course, students explore ways to reason with numbers in a variety of contexts important for their individual lives, their community, and beyond - it helps them understand the world we live in, and the challenges we face in the 21st century. To answer the most important question, “Are students learning?”, we designed a two-year research project. We employ action research, combined with quantitative and qualitative data analysis methods, to assess gains in student learning and skills development using a number of instruments, including pre- and post-test surveys, class activities, course assessments and teaching evaluations. Additionally, we explore the possibility of a wider adoption of the “Numbers for Life” numeracy curriculum.

Integrating the Investigative Cycle into an Introductory Statistics Course**Mark A. Earley, Columbus State Community College****Abstract**

GAISE (2016) guidelines encourage statistics instructors to contextualize course material around the investigative cycle, which includes asking questions, collecting appropriate data, analyzing that data, and interpreting results to answer the question(s). In this presentation, I discuss integrating the investigative cycle into my introductory statistics course through a social justice lens. After sharing what this cycle looks like, I will share my process for integrating the cycle into my Autumn 2021 courses, continuing into Spring 2022. I will share how I engage students with the cycle, as well as the results I see in my classroom. The investigative cycle has the power to show students that statistics is not a series of numbers and formulas, but rather a cyclical process oriented toward answering important questions about the world in which we live. With these discussions, students develop statistical thinking skills and use higher-order thinking skills such as applying, evaluating, and creating.

Can Numeracy Clarify Connections Between Self-Assessed Competence, Demonstrable Competence, and Mindsets?**Steven Fleisher, Cal State Channel Islands****Edward Nuhfer, California State Universities****Abstract**

Does employing a growth mindset result in better academic performance than does employing a fixed mindset? In this paper, we extend our earlier self-assessment studies to the area of mindsets (conceptualized by psychologist Carol Dweck). We again employ paired measures of demonstrated competence and self-assessed competence. To assign students to mindset categories, we added conventional diagnostic survey queries and registered decision for choosing or rejecting performance feedback. Soliciting feedback proved to be a better indicator of growth mindset than responding to established survey queries. We found that those who request feedback, on average, significantly

outperformed those who rejected feedback on a validated test of cognitive competence. Dweck's characterizations of the two mindsets hypothesizes that operating from a growth mindset would be associated with increased cognitive competence, but researchers' results to date offered mixed support. Our work here offers the clearest support to date for this prediction.

The Quantitative Reasoning Pathway in Ohio

Gregory D. Foley, Ohio University

Abstract

The Ohio Departments of Education and of Higher Education have embraced the mathematical pathways movement and have developed a course in Mathematical Modeling and Reasoning at the secondary level and a course in Quantitative Reasoning at the postsecondary level to serve as alternatives to Algebra 2 and College Algebra, especially for non-STEM majors. In this session, after a brief history of the Ohio pathways movement, the development of these two courses, and Ohio's guaranteed transfer program, the attention will shift to concerns about fidelity of course implementation and a possible solution via professional development for instructors. Participants will engage in a discussion of what can be learned from the Ohio experience and how Ohio's model can be adapted for other U.S. states.

Easing Math Anxiety

Kaitlyn Gringas, Trinity College

Abstract

Have you ever overheard a student say, "I hate math" or "I never do well in math?" Have you ever wondered why you don't hear students saying "I hate English?" A major reason that students feel this way is that they are suffering from math anxiety. The good news? Students can overcome math anxiety and learn techniques that can help them be successful in math courses! In this presentation, you will learn about math anxiety, how it shows in your students, and helpful strategies and techniques you can teach them to overcome this issue in order for them to be successful

Mastering Numeracy Tasks: A Suggested Approach

Taras Gula, George Brown College

Miroslav Lovric, McMaster University

Abstract

The challenge of developing a web application as part of the Health Numeracy Project led to a recognition of a need for an explicit differentiation between mathematical and numeracy tasks. For example:

Mathematical tasks are about mathematical ideas and objects and their relations (they live in abstract world).

Numeracy tasks are about concrete objects and their relations; (mathematical objects and relations are tools that can help make sense of phenomena in the context that is being studied).

We will show how previous attempts at addressing a numeracy gap in Ontario two year colleges have muddled the two, by providing examples that illustrate a possible source of confusion for students. We will also provide a model (Conrad Wolfram's [computational thinking model](#)) for the development and evaluation of high quality numeracy tasks, and give you a chance to assess the utility of the model through a short activity.

Math for Liberation: Designing a Math of Voting Systems Unit for Middle School**Tess Hick, Bates College****Abstract**

We discuss an implementation of a week-long voting module in an eighth-grade classroom by a student teacher in collaboration with the classroom teacher. The goal of the module is to connect math to social action to help students understand math as a tool in recognizing injustice, working towards justice, and advancing their individual and community goals. Drawing from the frameworks of scholars such as Gutiérrez, Leyva, and Yosso, the lessons are pedagogically grounded in community and relationships, student expertise, communal knowledge production, and social critique and action. These grounding values help to make the mathematics classroom a place where all students are valued as their full selves and are able to thrive. Students create informed mathematical opinions about plurality, runoff, and ranked-choice voting systems, culminating in a student-created proposal for which system should be used in student council elections the following year. Co-teaching by both teachers promotes long-term module adoption.

The Philosophy of Teaching Statistics**Daniel Jelsovsky****Susan Serrano, Florida Southern College****Abstract**

The traditional focus of general-education mathematics courses is often precision and numerical manipulation. Method is considered more critical than result. Exactness is rewarded. Students enrolled in these courses are often there solely due to a general-education requirement. General-education statistics classes, on the other hand, are often populated with students who require statistical ability in their majors and/or careers. This means that, to the students at least, results are critical and precise manipulations far less so. For that reason, we need to make sure that general-education statistics instruction meets the needs of the students enrolled in those courses, and is not simply a repackaged mathematics course. We will discuss the importance of teaching statistics with these goals in mind and will present some examples.

Numeracy in Literacy: Why Quantitative Reasoning Matters in Pre-Service Teacher Education**Amanda L. Lindner****Ramona T. Pittman****Kathryn Appenzeller Knowles, Texas A&M University-San Antonio****Abstract**

Quantitative reasoning (QR) skills are critical for success across all aspects of academia and life. However, it is easier to connect QR to content areas that are often viewed as “numbers” or “data” courses. This paper will highlight why preservice teachers (education majors) must be well-versed in QR, as PreKindergarten–12th grade students’ data should inform the instruction taught to students. Data-driven decision making is particularly necessary in literacy, as 60% of U.S. students are not reaching proficient levels in reading. QR using literacy examples will be presented, as well as reflections and feedback from preservice teachers on the importance of implementing QR in literacy courses. Additionally, participants will complete a hands-on QR literacy activity to help them understand the connection between QR and literacy development.

Embedding Support into a Large Gateway QL Course to Promote a More Equitable Environment**Rachael M. Lund****Samara Chamoun, Michigan State University****Abstract**

At Michigan State University, the Quantitative Literacy 1 course (MTH 101) is a university requirement for non-STEM majors that requires no pre-requisite knowledge. It is a large course that serves approximately 1800 students per academic year. Currently, this course is run as an asynchronous, virtual course. In an effort to support the diverse student population and improve equity, we have embedded support such as advising, technology help, and intervention for struggling students into the structure of the course. We are piloting this support program this Spring '22 semester with our course of about 600 students. Our students face many challenges when they enter the university system due to varied backgrounds. We want to share how we are addressing those challenges by providing more in-depth human relationships and creating a more equitable environment. We will discuss the interventions we are piloting this semester as well as our future plans.

Numerator versus Denominator Thinking**Heather Mechler, University of New Mexico****Abstract**

This session focuses on how humans can make sense of large-scale phenomena through the lens of numerator thinking (absolute frequency of an event) or denominator thinking (prevalence within a specific population). One perspective may be more adaptive in a given situation, but understanding both approaches allows us to have a more holistic view of a phenomenon. This also allows us to combat misinformation or to provide more robust context to an isolated statistic when one approach is inadequate to promote understanding. Illustrative examples from the ongoing COVID-19 pandemic will show how we have processed the large amount of ever-evolving information to understand risk, inequities, and the human toll of the past two years.

Developing Data Literacy Competencies: A Pilot Program for Librarians**Diego Mendez-Carbajo, Federal Reserve Bank of St. Louis****Abstract**

This presentation describes a recently launched program from the Federal Reserve Bank of St. Louis aimed at developing data literacy competencies among librarians. The Research Division at the St. Louis Fed is widely known for its flagship data service FRED®. An integral part of our work facilitating access to data is building capacity among educators to use data effectively and accurately. Our Library Services and Economic Education teams have developed a fully asynchronous online professional development program on data literacy for librarians. This program focuses on seven foundational data literacy competencies and uses FRED® data to provide opportunities for hands-on learning. Each competency in the program is matched to a digital badge issued by Credly. Librarians successfully completing individual modules will receive, at no cost, Credly badges certifying their achievement. After completing all seven individual modules, librarians will receive a digital micro-credential on data literacy. We are working to broaden the scope of this initiative and will seek feedback on it from conference attendees.

Paired Measures of Competence and Self-Assessment Accuracy Can Reveal Institutions' Educational Quality**Edward Nuhfer, California State Universities****Rick Zechman, Cal Poly Humboldt****Steven Fleisher, Cal State Channel Islands****Abstract**

Is your institution mostly training or educating its students? Paired measures of cognitive competence and self-assessment accuracy across undergraduate academic ranks reveal whether an institution is predominantly training or educating the students that it recruits. Unfortunately, assessment of student learning in educating often occurs through cognitive testing alone. Training develops expertise through teaching of disciplinary knowledge and skills, and these are assessable through cognitive testing. For educating, such an assessment is insufficient because educating develops cognitive expertise plus the understanding of self. Schools rarely intentionally teach or assess the latter. Self-assessment accuracy of one's competencies is measurable and is a relevant indicator of capacity for understanding self. Educating aspires to increase capacity for higher-order thinking, and such thinking requires achieving self-knowledge. Developing higher-order thinking requires committing to teaching both mastery of disciplinary knowledge and self-assessment. Assessing success at meeting this commitment requires paired measures.

Integrating Quantitative Reasoning in the Majors through an Interdisciplinary Faculty Learning Community. A SUMMIT-P Project**Victor Piercey, Ferris State University****Abstract**

There are several challenges to integrating quantitative reasoning across the curriculum. In some disciplines and programs, faculty are hesitant due to their own discomfort with quantitative matters, and even when provided with support, it is often in the form of canned lessons which they find difficult to improvise with or deviate from. At Ferris State University, we are working with faculty from social work and nursing to develop our quantitative reasoning program. Faculty learning communities are a form of professional development in which those involved all participate on an equal footing and develop their interests together. We created a faculty learning community for participants in these areas to develop and take ownership of quantitative applications in their disciplines. In this talk, we will see how the faculty community was run and some examples of the work products from the participants.

Quantitative Reasoning and Foreign Affairs: Examples of Teaching with Genocide and Refugee Camp Management. A SUMMIT-P Project**Victor Piercey, Ferris State University****Abstract**

The news in recent years has highlighted the treatment of the Uighur minority in northwestern China and, to a lesser extent, the Rohingya in northern Myanmar. Some have called these events genocide. For the Rohingya, there is a network of refugee camps in Cox Bazar, Bangladesh just over the Myanmar border. In collaboration with partner disciplines, the mathematics faculty at Ferris State University developed assignments to examine the scope of the Uighur relocation as well as the management of Rohingya refugee camps. I will share examples of the assignments, including different approaches to implementing the same ideas.

Financial Literacy: An Essential Real-World Skill and an Issue of Equity**Marla Sole, Guttman Community College, the City University of New York****Abstract**

With many young people aspiring to work as entrepreneurs, decisions about investment options shifting to individuals, and social safety nets disappearing, it is more important than ever that today's youth are financially literate. Yet, less than half of the states require students to learn about finance in high school. This presentation will share the value a sample of college students I taught place on financial literacy, the connection between financial literacy and inequality, and how to integrate financial literacy into mathematics courses to help students reason quantitatively. College students taking an entry level quantitative reasoning course were eager to learn about basic finance. Students saw the purpose and relevance of the topics covered, which not all students in traditional mathematics courses see. Financial literacy, when integrated into basic mathematics courses or quantitative reasoning courses, can teach students who will pursue a wide range of disciplines and careers essential skills that they will use throughout their personal lives.

Quantitative Reasoning for Active Citizenship**Amrit Bahadur Thapa, Ohio University****Abstract**

In this presentation, I will include two examples from my freshman-level quantitative reasoning course in the Spring 2022 semester at Ohio University. My students have diverse majors, including studio art, graphic design, interior architecture, creative writing, integrated social studies, music, theater, and political science. I am engaging my students in data visualization and statistical representation using technology related to critical social and political issues that provoke the students to think critically and share their voice. Both examples involve brainstorming, critical self-questioning, and sharing, followed by related videos. This is further followed by in-class and Blackboard discussion. I invite students to bring data visualizations related to their majors or to social or political issues, or other areas of their interest. After presenting these examples, I will invite suggestions and encourage participants to share what they do in their situations.

The Mathematical Autobiographies of Faculty Participating in a Quantitative Reasoning Faculty Development Program: Trauma and Triumph**Esther Wilder****Rebecca West, Lehman College, the City University of New York****Abstract**

The mathematical autobiographies of students and educators can provide helpful insights for the development of effective instruction in quantitative skills and mathematics. This paper describes the mathematical autobiographies of faculty participants in a multidisciplinary quantitative reasoning (QR) faculty development program. Sixty-one participants from a range of disciplines took part in the program from 2013-2019. Three major themes emerged from the autobiographies: negative experiences with mathematics (for example, math trauma, fear of bad grades, ineffective math teachers, gender bias), positive experiences (using math to better understand the world, nurturing educators, success), and the importance of making math relevant. Autobiographies were divided between mainly positive and mainly negative experiences, with many also reporting opinions and

experiences that changed with life circumstances or perspectives. In addition to providing participants with insights into their colleagues' experiences, and encouraging discussion of those experiences, the autobiographical exercise encouraged faculty to confront their mathematical anxieties and guided them in the development of QR pedagogical tools.

Working Group

Power Up Your Program! Strategies to Ignite Faculty Interest in QR

Kathryn Appenzeller Knowles, Texas A&M University-San Antonio

Abstract

Developing a QR program is challenging. In addition to recruiting and training faculty, educational leaders frequently must build programs with limited funds. In this working group, we will share our experiences to identify common challenges and begin brainstorming strategies to ignite faculty interest in QR. Attendees will work in small groups to discuss affordable engagement strategies that create and sustain momentum for QR initiatives. During the session, faculty who participated in a successful Texas A&M – San Antonio's QR Fellowship Program will share their experiences and collaborate with attendees about how to 'power up' their QR programs.