

NNN 2019 Annual Meeting in Austin Texas

INVITED SPEAKERS

Uri Treisman

**Title: The Equity-Minded Design of Introductory Mathematics Courses:
New Approaches to Perennial Instructional Problems**

Abstract: My teaching partner, Erica Winterer, and I will describe our current instructional work, which is designed to welcome newcomers to the social world of mathematics and to support their successful pursuit of the discipline. We'll share the research and professional practices that have inspired our work as well as strategies that we suspect have the most promise for introductory quantitative literacy courses. Finally, we'll share documentary evidence of the influence of our practices on the academic and social lives of our students. This is a talk about practice. It may be a bit messy.

Bio: Philip Uri Treisman is a University Distinguished Teaching Professor, professor of mathematics, and professor of public affairs at The University of Texas at Austin. He is the founder and executive director of the University's Charles A. Dana Center, an organized research unit of the College of Natural Sciences.

He is active in the leadership of many organizations dedicated to the improvement of mathematics education. He received the 2016 Mathematics Excellence Award from AMATYC and the 2019 Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics from the Mathematical Association of America.

Nicholas Horton

Title: Data acumen and data numeracy: helping students extract meaning from data

Abstract: Our world is awash in data. How can we prepare students to make sense of it? In this talk I will argue for a broadening of quantitative literacy and quantitative reasoning to incorporate "data acumen" and suggest ways that these capacities can be developed and nurtured. I will outline approaches and techniques that can help students develop a foundation to create and critique sophisticated arguments using data.

Biography: Nicholas Horton is Beitzel Professor of Technology and Society (Statistics and Data Science) at Amherst College. He is a fellow of the American Statistical Association and the American Association for the Advancement of Science. Nick served on the American Statistical Association GAISE (Guidelines for Assessment and Instruction in Statistics Education) report working group, was a member of the writing group for the Two Year College Data Science Summit, was an author of the National Academies "Data Science for Undergraduates" report and chaired the ASA's guidelines group for undergraduate statistics programs. He serves on the National Academies Committee on Applied and Theoretical Statistics and the Roundtable on Postsecondary Data Science Education.

Gaze: Eric Gaze.

Rhetorical Numbers: Using Quantitative Evidence in Writing and Argumentation

Abstract: This workshop will focus on identifying the core elements that underlie effective communication with numbers. This will lead to thinking about course materials that incorporate quantitative reasoning (QR) and argumentation. The American Association of Colleges and Universities (AACU) has identified quantitative literacy “as one of the few key outcomes that all students, regardless of major or academic background, should achieve during undergraduate study.” Contemporary argument increasingly relies on quantitative information and reasoning, yet humanists neglect to include QR as part of the rhetorical arts. We will explore how to address these issues in our assignments.

Schild: Milo Schild, Augsburg University

Statistical Literacy as Quantitative Rhetoric:

Abstract: Rhetoric studies effective communication and persuasion. Historically, rhetoric was primarily qualitative. With the advent of computers, social statistics are everywhere. Today, statistical literacy is an important component of modern rhetoric. Statistical literacy studies statistics in arguments. This workshop reviews the foundational elements of statistical literacy: 1) Defining statistics as numbers in context. 2) Distinguishing association from causation. 3) Understanding different kinds of associations. 4) Understanding the role of confounding in arguments involving statistics. 5) Distinguishing and evaluating different kinds of studies. The only math is arithmetic (no algebra).

Makansi: Jason Makansi, President, Pearl Street; Author, *Painting By Numbers*

Present at Creation: Integrating QL/QR Concepts into the Curriculum for a New High School

Abstract: Present at Creation: Integrating QL/QR concepts into the Curriculum of a New High School presents, for discussion with and feedback from the NNN community, findings from a research project designed to determine whether a committee forming a new, innovative high school has interest in integrating QL/QR concepts into its curriculum and, if so, what are the best pathways for accomplishing this. Findings and insight will be derived from a series of interviews with committee members, parents, teachers, and other interested parties, as well as QL/QR innovators and practitioners around the country. In the facilitated discussion, the NNN community can provide feedback, ideas, recommendations, and best practices which will then be shared with the school committee. Results from this effort could lead to a general methodology for integrating QL/QR into other curricula and educational models.

Melfi: Camille Fairbourn, John Keane, and Vince Melfi, Dept of Statistics and Probability, Michigan State University

Deterministic thinking and the replication crisis

Abstract: Many areas of research and industry are experiencing a replication crisis wherein scientific findings cannot be reproduced. Central to this phenomenon are the ways researchers and consumers of their studies understand decision making under uncertainty. It is widely-agreed that deterministic thinking, i.e., pursuing a determined ‘correct’ conclusion thought to be embedded in collected data, is a culprit in perpetuating this crisis.

Although there is an abundance of recommendations (see the most recent issue of *American Statistician*, which contains 43 articles of often contradictory advice), instructors can and must do a better job developing students’ ability to reason and make decisions amid uncertainty. This session introduces methods that help students become comfortable, confident, and experienced with decision-making under uncertainty and better recognize when deterministic thinking about data is inappropriate. Discussion and activities focus on how to incorporate methods into existing courses.

Yust: Anne Yust, Mathematics and Quantitative Reasoning, Eugene Lang College of Liberal Arts at The New School

Data Visualization Options: A hands-on exploration

Abstract : We expect our students to communicate their findings effectively by producing appropriate graphical representations of their data. However, students are frequently given calculators, spreadsheets or statistical software to produce their visualizations. The charts created by these tools are often low-resolution, static, and difficult to modify. In this working group, we’ll explore a variety of tools that produce professional-quality data visualizations without programming experience and are freely available for classroom use. We will focus on Tableau -- an industry standard, but we will also briefly explore web-based alternatives. I’ll provide a small repository of datasets that highlight various areas of social and environmental inequity via Google Drive that participants are welcome to use in their own classrooms. Participants will want to download Tableau Desktop prior to the session through the Tableau for Teaching initiative (<https://www.tableau.com/academic/teaching>), but all other tools will be accessed via the web.

Bae: Younggon Bae, Kathryn S. Knowles and Rebecca L. Matz, MSU. Samuel Luke Tunstall, Trinity U.

Alignment between Learning Objectives and Assessments in a Quantitative Literacy Course

Abstract: We examined how course assessment items were aligned with learning objectives in a quantitative literacy course at Michigan State University. The alignment analysis consisted of mapping assessment items to a list of operationalized learning objectives from the course. Our analysis shows how often the learning objectives are represented in assessment items, how often they are paired with other learning objectives, and how influential they are in contributing to a student's course grade. In addition, through comparisons across four assessment types (e.g., exams and homework), we examined how each learning objective was assessed differently within each assessment type. Our study shows how quantitative literacy learning objectives can vary with assessment type in a course, and also provides numeracy scholars with an analysis technique suitable for use at their respective institutions.

Balli: Chelsie Balli, Director of QR and Instructor of Mathematics, Biola University

Making QR Accessible to All Students: A QR Course Sequence Designed for Non-STEM Majors

Abstract: Chelsie Balli is the Director of Quantitative Reasoning at Biola University and has been responsible for launching a sequence of Quantitative Reasoning courses as a part of Biola's new Core Education initiative. This initiative is focused on improving the Core program for non-STEM majors and better integrating the courses with one another. Biola has spent the past year testing and refining the courses to best equip students with relative and applicable skills. Each QR course is linked with another course in the Core program, namely the Behavioral Sciences, the Natural Sciences, and English. These courses incorporate content, skills, and application related to each respective Core course. In this session, Chelsie will discuss the unique structure of the program and how it has been adapted to reach all students. The presenter will share challenges to the development and implementation of these courses, as well as observations gathered up to this point.

Benakli: Nadia Benakli and Estela Rojas, New York City College of Technology (NYCCT)

Necessary Competencies for an Effective QR Course

Abstract: In many mathematics classrooms, the lessons focus on routine exercises. This approach cannot be effective in a QR course. Mathematics teachers need to transform the way they deliver, to enable students to acquire the necessary skills to promote their thinking process. The learning of mathematics requires a broad range of thinking and reasoning skills. Thinking involves many different steps, such as, observation, raising questions, communication, listening skills, and collaboration. Faculty through professional development will have a better understanding of the thinking process, and will be better equipped to support students by creating activities that will actively engage students in the acquisition of these competences. We will discuss activities that will incorporate some of these skills. Faculty involved in professional development at NYCCT will implement these in their lessons, Fall 2019. We will also share the workshop's faculty feedback.

Bourdeau: Debra Bourdeau (English) and Beverly Wood (Mathematics). Embry-Riddle Aeronautical University

How Can Walt Whitman Improve Quantitative Reasoning?

Abstract: This presentation will discuss Humanistic STEM (H-STEM), defined as a blend of technical competence in science, technology, engineering, and mathematics with interest in, and concern for, human affairs, welfare, values, or culture. The speakers are developing a set of H-STEM courses at their institution to form a unique, interdisciplinary minor. Students in H-STEM courses will learn the language and methodologies commonly associated with these various disciplines, both to understand their commonalities and also to appreciate their differences. They will also learn how the humanities disciplines perceive, interpret and discuss the seemingly diametrically opposed STEM disciplines. H-STEM has the ability to elevate humanities and STEM education at the university by fostering partnerships among humanities, science and mathematics faculty, and by introducing a population of STEM-focused students to the importance of an integrative, humanities-focused approach to learning early in their collegiate career, something that more employers are saying is valuable.

Erhardt: Erik Barry Erhardt, Mathematics and Statistics; Woong Lim, Secondary Education. University of New Mexico

Effects of a Standards-based Teaching Method on Students' Learning in Introductory Statistics

Abstract: This study aims to compare two teaching methods in an introductory statistics course at a large state university. The first method is the traditional lecture-based approach. The second method implements a flipped classroom and incorporates the recommended standards of statistics education with learning opportunities for students to develop recommended skills and knowledge and build a productive mindset in statistics. We compare these two methods (generally 4-point increase for all students), based on student performance, illustrate the procedures of the new pedagogy, and discuss our visions of teaching introductory statistics as aligned with the GAISE recommendations.

Follette: Kate Follette, Astronomy, Amherst College

Demographic Effects on QR Assessments

Abstract: Given robust evidence refuting the idea that there are inherent differences in intellectual ability by race, gender, or disability status, why do students with certain identities score significantly differently on quantitative reasoning (QR) assessments? Our group has been exploring the relationship between students' identity, attitudes, and performance on numerical assessments, which is important in the context of equity and inclusion because quantitative skills present a significant barrier to entry to STEM fields. In previous work, we demonstrated correlations between demographics and performance on the Quantitative Reasoning for College Science (QuaRCS) assessment, however we also showed that these effects are small relative to swings in performance relative to attitudinal variables. Recently, we have been exploring how differential affect (e.g. math anxiety, numerical self-efficacy) between demographic groups mitigate score differences. For example, we find that differences in math anxiety rates explain relationships between score and gender. We will present similar models for race/ethnicity and disability status, and will discuss possible classroom interventions for general education STEM courses.

Gingras: Kaitlyn Gingras, Mathematics, Trinity College

Introducing Projects in QLIT 101

Abstract: Trinity College's "Foundational Techniques for Quantitative Literacy" course has traditionally been taught as a standard College Algebra course. In an effort to move it towards a more strict understanding of quantitative literacy, we have integrated more applications as well as take home projects into our course work. In order to transition from the traditional College Algebra model and into the Quantitative Literacy model, it is vital to show students the value of using the mechanics in a more meaningful way and to be able to apply them to their careers in college and beyond. Projects are loosely related to topics being covered in class including linear, quadratic, and exponential functions. This session will explore how we came to include these projects into the class, how they have evolved over the past few years, and what they have added to the course as a whole.

Grawe: Nathan Grawe, Editor of Numeracy. Economics, Carleton College

Title: Writing articles for *Numeracy*

Abstract: Authors sometimes lament, "I wish editors would just tell us what they are looking for!" This session is intended to do just that. Drawing on more than 200 published pieces in the journal and his experience guiding papers through the publication process, Numeracy executive editor Nathan Grawe will talk through the elements of successful submissions to the journal, including discussions of: powerful abstracts, clear organization, effective communication of results, insightful discussion sections, and productive citations (i.e. those which advance the conversation within the discipline by making meaningful connections to the ideas that have come before us). In addition to examining paper elements, Nathan will discuss successful paper types such as descriptions of new QL/QR programs, assessments of teaching interventions, discussions of previous Numeracy publications, notes on teaching tools, and book reviews. We will be sure to have plenty of time for Q&A at the end of the session.

Hildebrand: Sarah Hildebrand, Mathematics, Midland College

Title: Corequisite Q/R: The Ideal Mathematics Class for Developmental Students on the Non-STEM Pathway?

Abstract: Corequisite courses allow for students requiring remediation to attain both their developmental credit and first transfer-level credit in the same semester. Corequisite Quantitative Reasoning (QR) comes with challenges that other remedial courses do not face. Midland College offers this corequisite course to non-STEM majors as part of their pathway to graduation. Throughout the corequisite QR course, the only difference in the traditional transfer-level class and the corequisite class is the developmental and support time. Meeting every day, rather than only a few times a week, and having both transfer-level and developmental instructors in every class has shown to work best for our students.

Hoiland: Sarah L. Hoiland and Esther I. Wilder, Sociology, City University of New York

What's Under the Tam? Addressing Stereotype Threat and Math Anxiety among Faculty.

Abstract: This presentation will describe the Numeracy Infusion for College Educators (NICE) Program, a National Science Foundation sponsored professional development program in its second iteration at three Bronx-based City University of New York (CUNY) institutions. Course content, faculty and student results of Tennessee Tech's Critical Thinking Assessment Tests (CATs), faculty participant survey data, and the preliminary external program evaluation will frame the presentation with emphasis on addressing non-cognitive aspects of quantitative reasoning/quantitative literacy including stereotype threat and math experienced by both faculty and students. Plans to expand professional development focusing on stereotype threat and math anxiety among faculty will be presented to the group for discussion.

Kiley: Erin M. Kiley, Massachusetts College of Liberal Arts

Teaching Mathematical Modelling in QL/QR Courses

Abstract: In the same way that language literacy is taught in classrooms not only through the practice of phonics and sentence diagramming, but through the practice of reading and analyzing real-life texts, so is mathematics effectively taught via modelling real-life phenomena. This idea is well recognized and mathematical modelling has been increasingly incorporated into learning outcomes at all levels. In this facilitated discussion, participants will be briefed on the Guidelines for Assessment and Instruction in Mathematical Modelling Education (GAIMME) as reported by the Consortium for Mathematics and its Applications (COMAP) and the Society for Industrial and Applied Mathematics (SIAM) in 2016. Using these guidelines as a framework, participants will discuss how modelling may already be incorporated in their QL/QR courses and will workshop several modelling projects for inclusion in their future QL/QR courses.

Knowles: Kathryn Appenzeller Knowles, Graduate Student at Michigan State University

Problem Task Framework for Quantitative Literacy and STEM Education

Abstract: Quantitative literacy (QL) and STEM education share key goals for preparing students for future local and global challenges and participating in our democratic society. In this session, I will discuss a task framework for QL that reflects shared goals of QL and STEM education that is used in middle grades math classrooms. The STEM problem-based teaching approach will be described in the context of a mathematics classroom and students' experience with the problem-solving process. Examples will draw on proportional reasoning problems since QL is "sophisticated reasoning with elementary mathematics more than elementary reasoning with sophisticated mathematics" (Steen, 2001, p. 9). I will discuss how the new approach may address the current challenges. This discussion will be continued to how participants can move forward in their own practice to address both STEM education and QL needs.

Krinsky: Sharona Krinsky, Cal State LA and Robert Bosley, LA Unified School District

Numeracy as a Critical Component in Bridging the K-12 to College Transition

Abstract: Bridging the college transition is one of the most challenging pieces of the Mathematics learning process. For the last six years, California State University Los Angeles, Los Angeles Unified School District, Baldwin Park Unified School District, the Alliance Charter School Network, and College Bridge, an educational non-profit, have participated in a partnership to align and streamline the high school to college mathematics transition. This program involves one-on-one teaching partnerships between college professors and high school teachers in dual enrollment transfer level Quantitative Reasoning (QR) courses. Successful students simultaneously fulfill high school and college math requirements in their senior year of high school and begin college having met their QR GE requirement, and STEM students are prepared to begin college in Calculus 1. This talk will present the results of this program, what has been learned about aligning Numeracy skills for optimal success in multiple college pathways, and how the professor/teacher partnership has enhanced the information flow and informed the curriculum design at both the high school and collegiate levels.

Love: Betty Love, Victor Winter, Michelle Friend and Michael Matthews. University of Nebraska at Omaha

A New GenEd Math Course: Combining Mathematical and Computational Thinking to Produce Visual Art

Abstract: There is a nationwide push for the creation of math pathways that provide alternatives to the traditional algebra-based pathway. At the same time, there is increasing demand for computer science education for all and the creation of computer science (CS) pathways. A significant element of CS education efforts is computational thinking, which, while fundamental to CS, can be applied to solve problems in any domain. This problem-solving focus significantly aligns with mathematics. In this session we will discuss our experiences with a new general-education (GenEd) mathematics course that combines mathematical thinking and computational thinking as precursors to writing computer code to produce visual art (supported by NSF Grant #1712080).

Nuhfer: Edward Nuhfer, Retired, California State Univ. and Paul Walter, Physics, St. Edward's University

Group Means of Self-Assessed Competence and Demonstrated Competence Detect the Differential Effects of Privilege and the varied Educational Impacts across Institutions

Abstract: In 2016 and 2017, we used a large base of reliable data from two aligned instruments and published two papers in Numeracy to challenge the common claim that "students can't self-assess." We showed that paired measures of self-assessed competence and actual competence are valid and valuable. In another Numeracy paper in 2019, we showed the application of the paired measures to understand social justice issues. In this presentation, we connect our prior work to our current research by tapping paired measures to detect signature changes in undergraduates that are unique to each institution. We show why teaching self-assessment skill develops beneficial self-efficacy and establishes a foundation for self-regulated learning. We advocate that an undergraduate experience should produce development of a person as a learner together with growth in knowledge and skills. Our work indicates how any institution might learn the degree to which that happens for its students.

Paixão: Marcelo Paixão, The University of Texas at Austin

Q/R for a Fair Society: recovering Paulo Freire's approach to teach QL/QR for students of the underserved communities

Abstract: We have been inspired by Paulo Freire's methodology of poor communities' literacy process. We cannot mechanically transpose Freire's proposal into a classroom at UT. However, despite the differences between a poor rural village and a U.S. prestigious university, we can envision a nexus between these distinct universes. The chronic difficulties encountered by students from historically underserved communities with QR courses can be interpreted – paraphrasing Freire – as a form of illiteracy or functional illiteracy on numbers. Also, the Brazilian educator stressed that the difficulties of the poor communities' literacy process were a consequence of the limitations of the traditional teaching methods and he encouraged alternative and critical pedagogies. Similarly, scholars have already proved that the causes of the challenges faced by historically underserved communities are not due only to the familiar backgrounds but are mainly driven by discriminatory practices and prejudices in the educational system since the first days of school.

Perez: Eileen B. Perez and Hansun To, Mathematics, Worcester State University

Accelerating Student Gateway Course Completion at a Massachusetts State University

Abstract: We begin with an overview of the four major based pathways and companion gateway courses. The four pathways are Liberal Arts and Social Science, STEM, Education, and Health Sciences; companion courses are Quantitative Reasoning, Introduction to Functions, Numbers and Operations, and Statistics, respectively. First, we will focus on the Liberal Arts and Social Sciences pathway and its gateway course, Survey of Mathematics. Highlights will include the evolution of the course, placement requirements, and the co-requisite version. The use of Inquiry Based Learning and Teaching and its impact will be discussed. Student outcome data over time is discussed. Next, the talk will shift focus to the Education pathway and its gateway course, Numbers and Operations. Placement into the course, course design, and the continuing evolution of the course will follow. The presentation concludes with lessons learned and future plans for each pathway and its companion gateway courses.

Reed:Carolynn Reed and Conrad Miller, Mathematics, Austin Community College

Honors Contemporary Math: Math and Politics

Abstract: Austin Community College offers an Honors version of Contemporary Math focusing on Math and Politics. Contemporary Math is a course designed for non-STEM majors surveying a variety of topics in mathematics such as logic, social choice theory, finance, and statistics. The theme of politics connected all these topics in a meaningful and engaging way. To provide the enrichment required of an honors course, students used Excel to explore realistic numerical examples such as the apportionment of the U.S. House of Representatives, and submitted two additional assignments: a position paper reflecting critically on the scope and feasibility of a class topic connected to the student's personal experience, and a group research project on a class topic consisting of a paper and oral presentation.

Reed:Carolynn Reed and Conrad Miller, Mathematics, Austin Community College

Quantitative Reasoning Corequisites: Merging Content with Activity-Based Courses

Abstract: Development education is undergoing a revolution toward corequisites, where students take the developmental support and college-level course simultaneously with just-in-time remediation. Initial dramatic increase in student success and math course completion has led colleges to jump into corequisite course development, by choice or mandate. Math faculty teams at Austin Community College carefully developed new courses, strategically scaffolding developmental support into college-level materials while simultaneously creating robust instructor supports. The Quantitative Reasoning corequisite courses address two different student preparation levels using an activity-based group learning approach. Attendees will briefly take part in an activity modified for two levels of student preparation, then see how student success support activities are woven into these courses.

Richardson: Connie Richardson, Manager, Higher Education Course Programs, Charles A. Dana Center

Expanding Access to Relevant Quantitative Reasoning Courses

Abstract: The math pathways movement calls for all students to engage in mathematical experiences that will best serve their professional, personal, and civic lives. In cases where the program of study does not call for extensive algebraic work, a well-designed quantitative reasoning or statistics gateway course should be the recommended option for the mathematics requirement. Come explore data about QR course offerings, which reveal that access varies greatly and disproportionately affects low-income and underrepresented minority students. We will explore the social justice implications of inequitable access and the trends in content of these courses. Recommendations and sample learning outcomes are provided for those looking to begin conversations about quantitative reasoning courses in their own region or state. Participants interested in this topic are encouraged to attend Joan Zoellner's presentation as an extension to this one.

Rod: Alisa Rod, Anna Carlson, Fatima Koli, Amelia Marcantonio-Fields, Haifa Rahman and Izzi Sibbers, Barnard College

Quantifying Spatial Data Numeracy: Designing a Map Assessment and Rubric

Abstract: This paper argues that spatial data and visualization skills (i.e. GIS/mapping) rely on three distinct components: empirical/quantitative reasoning, critical thinking, and design proficiency. This research paper discusses the development and testing of an assessment tool for the purpose of evaluating students' proficiency working with and understanding spatially-oriented data. In particular, this project focuses on the conceptualization and definition of the empirical/quantitative reasoning skills component that underlies spatial data numeracy. We report on a pilot study conducted in spring 2019 in three Barnard College seminars in which we taught spatial data/mapping workshops (n = 42). Numeracy was captured using the Subjective Numeracy Scale (SNS). We will also report on preliminary results of an updated version of the full study to be implemented in fall 2019 in the two sections of the Introduction to GIS Methods course offered by Barnard College's Urban Studies department (estimated n = 50), in which we will also implement pre- and post- tests incorporating the SNS and measures of objective numeracy.

Rossa: Bernd Rossa, Mathematics, Xavier University

Teaching QL/QR to students in non-quantitative majors: A Quantitative Reasoning approach to Pre-Calculus

Abstract: We will briefly describe recent changes at our University regarding general education requirements for graduation, which included a 3-hr course which contains QR elements. The mathematics department decided to revise a general education Pre-Calculus course to include a significant QR character, and to use Eric Gaze's course "Thinking Quantitatively". One important goal of our course is to help students understand what information is contained in the slope of a straight line. It is our view that, in order to transition students from memorization to figuring things out themselves, we must give them something they can actually think about without much technical language. We believe that QR, and the Gaze materials in particular, provide a wonderful platform for this transition. However, we ran into significant difficulties teaching the course. For example, we failed at getting our students to set up proportions correctly. We will indicate what we have done to try to create a conceptual foundation for setting up appropriate proportions. It was key to understand better how all of the different topics in the early Chapters of the Gaze materials (on Ratios) are connected through the concept of Relative Size.

Savina: Frank Savina, Course Program Specialist, Charles A. Dana Center, University of Texas

What does numeracy for STEM students look like?

Abstract: We often identify deep algebraic fluency as one of the core mathematical skills necessary for success in STEM fields. However, it is important to recognize that in addition to fundamental algebraic fluency, students in STEM programs that require Calculus also need to develop quantitative reasoning skills that allow them to grapple with deep and meaningful problems associated with change. What does numeracy for STEM students look like, and how do we as math faculty create curricula that develop these skills and prepare them to tackle deep and meaningful problems in Calculus? This session will tackle these questions, and provide ample opportunity for participants to discuss processes for curricular development that promote quantitative literacy in STEM students. [This session is intended to follow Joan Zoellner's presentation]

White: Jordan D. White, Mathematics, Univ Maryland (UMBC)

Logic and Literacy: Connecting Q/L with Traditional Literacy, and Changing the Conversation about Mathematics

Abstract: Mathematics is a language. It is about communication and representation. It is about systems, networks, understanding, and ideas. We discuss the universe using mathematics. Quantitative Literacy is crucial. It permeates everything as a result. Traditional Literacy is also important. Knowing how to read, how to write, and how to communicate impacts our everyday lives. Not having quantitative literacy, or not having it in a strong capacity, impacts how people interact with mathematics and the world. Changing the conversation surrounding mathematics is the key to fixing that problem. Connecting it to what we know is key. The link between literacy and logic is key. They are two sides of the same coin and it is time we explore that.

Zoellner: Joan Zoellner, Course Program Specialist, Charles A. Dana Center

Collaborating with Math Departments to determine most appropriate math course for your program

Abstract: A core principle of Guided Pathways (and math pathways) is that all students should take a math class that is aligned to their program of study. However, the guidance for identifying this class is often not very explicit: the program faculty should work with the math department to identify the most appropriate course. In this session, participants explore the work that partner disciplines can do prior to meeting with math department representatives to ensure that their discussions will be productive and lead to choosing the math course most appropriate and useful for each program. It will also explore artifacts that the partner discipline faculty can provide to help the math department understand the numeracy needs of students in the program. [Intended to follow Connie Richardson's presentation]

Agnello: Angela Agnello. Graduate Student, University of Connecticut

Are Newsela articles accessible for all? A look at the impact of Newsela's text simplification on numeracy events

Abstract: New York based education startup, Newsela, has quickly gained popularity with K-12 educators in its six years of existence. It's website boasts that it serves 90% of schools in the United States including the 1.5 million teachers they employ and their 20 million students. But what makes it so popular? Likely the most appealing aspect of the platform is its compatibility with differentiation, as it makes available five iterations of each article at varying levels of complexity, or Lexile. This enables teachers to assign the same article to all students regardless of differences in reading ability. Because all Newsela articles are nonfiction, many utilize mathematical representations to communicate quantitative information, placing demands on students' numeracy competencies. This paper explores the ways in which quantitative information is represented in Newsela articles at differing levels of complexity and what happens to the mathematical representations of quantitative information as text complexity decreases.