Adult Learners' Perceptions of Mathematics Class

Brooke Istas

Brooke Istas was the 2020 COABE Incentive Grant winner. This presentation will reveal preliminary findings of her study, “Adult Learners’ Perceptions of Mathematics Class.” The goal of this research is to undercover the underlying reason that math goes from a positive to a negative experience. Participants of this session will learn more about her study, data collection, and early findings. There will be an open discussion about this study’s impact on the adult numeracy field.

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This research will help educators to understand the impact of mathematics anxiety/mathematics trauma. The bigger impact is that by understanding how math goes from a positive to a negative experience will allow researchers to create interventions to mitigate their trauma.

Success in Practice: How to Leverage Self-Reflection and Problem-Solving Review in the Adult Mathematics Classroom

Kamila Goldin and DaNelle Cook

As humans we are constantly growing and learning, evaluating our old practices and using our experiences to navigate through life. Integrating reflective practices into the classroom can propel learners to higher levels of success and self-confidence. Join us to learn key opportunities for reflection in the learning process, discuss testimonials from multi-level math classrooms, and identify resources for developing the seeds of practices that can blossom in their classrooms.

Part 1: The case for reflection as a necessary skill for personal development, growth, and mathematical mastery. - Self efficacy, and the connection to self-talk - Independently reviewing knowledge and concepts to develop familiarity and personal connections - Reviewing notes and re-working solutions, internalizing procedures of problem-solving (mathematical procedures, problem-solving strategies) Part 2: Demonstrated Implementation. Presenters will share personal examples and resources for the different opportunities for learner reflection (Case Studies). Time permitting, there will be a discussion of ways to apply these strategies in participants' classrooms. (Self Efficacy, Knowledge and Concepts, Problem-Solving Strategies) Part 3: Adaptations for your Classroom. The final portion of the presentation will give participants a chance to identify a promising practice that already exists in their classrooms and workshop it for intentionality and sustainability. (Instructor Routines, Classroom Structures, Student Interest, Student Readiness)

Participants will be able to name three key opportunities for self reflection that are present in all math lessons. Participants will hear stories from real classrooms and discuss presenter suggestions for facilitating student reflection. Finally, participants will begin the process of developing tools for their specific classrooms through guided collaboration with their peers in the session. As a result of this training, participants will be better positioned to bring the following benefits to their adult learners: Deeper and more consistent self-efficacy (a better sense of self and abilities, increased value in selves as problem-solvers, a pathway for success in the face of challenging mathematics, etc). By re-working examples and applying the process, (of completing word problems) students will have steps (and increased confidence) to approach word problems. The students will regularly experience the benefits of reflection and review, and be able to make the connection between their increasing mathematical confidence and their reflective routines. Collectively, the presentation offers a concrete set of practices that will develop the executive functioning and planning skills of adult learners in the mathematics classroom, with attention to the socioemotional benefits of strategies that allow them to rely on themselves to get through tough situations.

Collaborating, Exploring Virtual Manipulatives, and Deepening Conceptual Understanding on Factors in a Distance Learning Classroom

Rebecca Strom and Lindsey Pust

Online learning has changed how we teach, but not what we teach. This session will give participants the opportunity to explore using Jamboard and Google Slides to collaborate as they dig into the conceptual understanding of "what is a factor"? We will start with what is multiplication/division and connect to factors, prime numbers, and square roots all using the exploration of virtual manipulatives. The focus will be on both building conceptual understanding and coherence.

Online learning has changed how we teach, but not what we teach. In a world of distance learning, where many of us are no longer in the classrooms, we have lost access to a lot of our educational "tools/resources" and have been forced to change our routines. This new online environment doesn't have to mean that we sacrifice the important parts of the classroom/learning environment. In this session we will focus on ways students can continue to collaborate with each other, explore virtual manipulatives, and develop conceptual understanding. During this session we will explore "factors of numbers". We will use a Jamboard as our platform so that students can collaborate and work together. We will start by having participants explore what it means to multiply and divide, by arranging squares on the Jamboard slide. We will continue and connect the idea to finding factors of numbers. Focusing on building coherence, participants will use the same virtual manipulatives and platform to determine if a number is prime. We will end with looking at numbers and determining if they are perfect squares and if not, estimating their value. We will also demonstrate how the same activity can be done with Google Slides.

I teach math on the ABE campus and co-teach two developmental math classes on the local community college's campus. After teaching on the college campus for 5 semesters, it has become very evident that students don't understand the word "factor". Being able to factor is a huge part of composing and decomposing numbers, simplifying fractions, solving algebraic equations, solving/graphing quadratics, and more. Outside of the classroom, this can also help make numbers easier to compute using mental math. Often in math classes students memorize words, but don't deeply understand them. This session will help build conceptual understanding for not only factors, but what a prime number is, and what it means to be a square root. Building this coherence will deepen their understanding and as well as give them a tool where they can duplicate the task again with other numbers.

Navigating Aloud: Making your Instruction Count During Times of Uncertainty

Graciano Peterson and Kamila Golden

Teaching during COVID-19 does not make for an ideal learning environment for any adult learner. During these times, it seems that we can only be assured of inconsistency. To counteract this challenge, be a source of constancy for your learners. By focusing on precision, using images and visual cues, and addressing your students' executive functioning, you can lead your students to achievements in the mathematics classroom despite the uniqueness of our current situation.

This session will encourage participants to hone in on practices that allow them to remain intentional and consistent, despite uncertainty in many other areas of our world, institutions, and classrooms. Recommended practices fall roughly into three areas: Precision (of language, of materials, of organization, of classroom routines and structures); Sense-making (of visual cues, icons, and patterns in the structure of website design); and Reasoning (executive functioning skills and routines that can be demonstrated regularly and that enable students to strengthen those skills themselves). Each area of recommended practice will be grounded in education research, demonstrated through examples, and supported with take-home materials that will set participants up for success in adapting and applying these solutions to their own instructional spaces.

Attendees will be able to describe multiple practices that can be implemented to strengthen learners' executive functioning skills as well as their mathematical orienteering skills. Each area of recommended practice will be grounded in educational theory, demonstrated through examples, and supported with take-home materials. Attendees will leave this session ready to successfully adapt and apply the recommended practices in their own instructional spaces.

Using EdReady to Assess and Support Student Progress

Dani Pedrotti, Cash Clifton, Matthew Edele

EdReady is an open-access resource developed by NROC, a membership organization. Adult education leaders in multiple states have aligned math assessments with NRS levels, College and Career Readiness Standards, and TABE. This session will cover how to use this resource to measure and support student progress.

How do I know when my students have achieved a level gain and when do I know when it's time to post-test? Using an assessment tool such as EdReady, you can predict how students will perform on TABE or CASAS to achieve a gain in an EFL. EdReady math assessments also determine a study path and provide material for students to improve the skills necessary to achieve level gains.

Instructors will be able to measure progress and determine when to use NRS approved assessments more accurately as well as determine when students are prepared to enter post-secondary education.

Strategies for Taking Anxiety Out of Math for Fearful Students

Wendy Kittler, Jana Jenkins

This session will provide several strategies to use with math anxious or math frustrated students in Adult Ed. Specific reasoning and brainstorming activities will be demonstrated, and apps for virtual instruction will be discussed. Many adult learners come to us because of deeply seated issues with learning that may be rooted from childhood or high school, and this is especially true in math. This presentation will help give the teacher strategies to bridge the gap.

Participants will learn signs of math anxiety, including sample surveys, and how to recognize the difference between math anxiety and dyscalculia, which is an actual learning disability. Specific strategies, brain teasers, and logic puzzles will be demonstrated and the audience may actively participate in. Videos of adult learner experiences will be shown.

If Adult Education Teachers recognize that math anxiety hinders some of our students' progress, they can implement some of the strategies to reduce the anxiety or frustration that our Adult Learners have when dealing with math content. Students can overcome their math fears and implement self-calming techniques, and become more open minded and build a toolbox of problem solving techniques to pull from.

Numeracy Routines that Develop Language

Connie Rivera

What math can you do with a class of students from varying math backgrounds who have a wide range of test scores? Help your students develop reasoning and thinking habits, practice and build language skills, and build community by regularly using short numeracy activities in your instruction.

We will work through a routine each from WODB.ca and Estimation180.com as well as look at related PIAAC research, but as an example of how we can approach opportunities for capitalizing on the curiosity that comes up during our classes. Participants will leave with ideas for integrating numeracy into their class routines.

Teachers who incorporate numeracy routines will help their students develop language and habits of mind (math practices) that make numerate adults. At the same time, students' attendance can increase because of the sense of community these routines can build.

Using teacher power wisely: Showing (math) learners how their ideas can be valuable gateways

Christin Smith and Joey Lehrman

Even in our digitized world, teachers are still seen as the authority within classrooms. What we publicly value as teachers affects what students believe is valuable. But! This means we have an opportunity to teach people the value of their own thinking. This is especially important in math class where many people have learned to ignore intuition. Leave this session with concrete ways to use teacher power for good in both distance and in-person settings.

Many students have had formative school experiences in which their own intuition took a backseat. When some student thinking counts more than others, classrooms are rendered inequitable. This session will begin with growth mindset messages, refuting common views that one might not be a "math person". Participants will then be given opportunities to think about math, and presenters will demonstrate how to broadcast what kinds of thinking are truly valuable in math learning. There are many really important ways of being smart including asking good questions, making really smart connections between ideas, developing a great representation of an idea, or being slow and systematic. Being quick and accurate is typically the only strength valued in school math, but if you look at the history of mathematics those are not even in the top five strengths that led us to important mathematical discoveries. Finally, we will discuss the need to change the kinds of math students see in class. School math still looks very different from the math done by mathematicians or within careers. We give students the opportunity to show their strengths in math by expanding what we think math is. Many resources to assist this transition will be shared.

The goal is to expose students to the limitations of existing frames of learning, encouraging them to consider more appropriate approaches that draw from their own cultures. Students are the focus of this presentation; Our purpose, ultimately, is to assign value to types of thinking often overlooked within traditional learning structures. In doing so, we hope to help adult learners reduce their anxiety and become more confident math learners and problem solvers. #equity

Remote, Hybrid & In-person Either Way We Gotta Teach Math

Cynthia Bell

Teaching math effectively and in an engaging way may have already been challenging. Now we have to navigate the remote and hybrid learning environments. If only there was a good model that you can use in each of these learning environments! Attend this session to find out the free and accessible tool that helps build student conceptual understanding, mathematical thinking and skills no matter where they're learning. Be sure to bring your own device.

The presentation will be presented in workshop format, and will engage participants in hands on activity, model using the Desmos tool for in person, remote and hybrid instruction. No specific expertise level is required.

Participants will be able to take what they have learned and use it in their virtual or hybrid classrooms to create deeper engagement for learners and strengthen their conceptual understanding and mathematical modeling skills.

Getting at the Heart of Conceptual Understanding and Mathematical Proficiency with Heart Rate Data

Heidi Schuler-Jones

Participants in this session will use data collected by taking their pulse to evaluate a pattern that can be measured and represented by in-out tables, rules in words, equations, and graphed lines on a coordinate plane. We'll debrief the activity by identifying the benefits of teaching math conceptually and with real-world applications, hallmark designs of the EMPower Math series. We'll also discuss where the 8 Mathematical Practices were experienced and modeled in our work.

Participants will be guided through a series of connected activities from EMPower Math's Seeking Patterns, Building Rules book. During the partnered and small-group activities, participants will experience how the lessons might be presented in their own classrooms, as they will be asked to be the student first before evaluating the activity through the lens of a teacher. They will have a chance to compare and contrast how the topics introduced are traditionally taught in the classroom versus how they explored the topics with the activities. This will allow for deeper conversations about using rigor in our lesson planning with particular emphasis on teaching conceptually and with real-world applications at the center of these lessons. We'll take time to identify which of the 8 Mathematical Practices were modeled and the impact of these Practices on the overall learning experience.

Adult ed instructors will come away from this session having experienced what it looks like to learn math outside of procedures alone. They will recognize the importance of working with hands-on tools and visual models and will have observed important teacher moves for asking deeper questions while holding back on giving away answers. Participants will see how the EMPower Math series provides structure and support for teachers unaccustomed to partnered and small-group activities. Likewise, they'll come away with important connections to a variety of math domains that typically are taught in isolation and will see how this design is maintained throughout the seven EMPower Math series titles. Each of these ideas, resources, and shifts in instruction will create more engaging classroom experiences for the instructor's students.

Leveraging Advanced Reading Skills for Success in Math

Graciano Petersen and Lateefah Montague

Students with disproportionately higher scores in Reading than Math don't often see the links between the two subjects. Utilizing your student's successes in reading can be essential to achieving success in math. This session will demonstrate that being able to make logical inferences, compare and contrast, recognize patterns, and identify key and signal words are reading skills that are fundamental to progress in the mathematics classroom.

This session will introduce attendees to strategies that will help them link advanced reading skills to math skills such as Compare and Contrasting to skills such as Proportional Reasoning, Patterns to completing Tables and classifying Functions, Identifying Tone and Scanning to being able to properly interpret and decipher word problems, and identifying signal words to properly using keywords in math. This session will help educators prepare their learners for math achievement test success and build skills that they will need for lifelong learning. An emphasis will also be placed on reinforcing Writing skills in the Math classroom. Attendees will gain advice on taking advantage of opportunities to have students elaborate via writing through the completion of sentence stems, explaining answers, and error analysis. By encouraging learners to write outside of the writing classroom, we are also building resiliency in writing while also encouraging learners to be clear about the accuracy of their responses.

Engage students in cross curricular learning Build cross curricular resiliency and fluency Allow students to explore writing skills outside of the writing classroom Explore reading and writing standards in math Explore math standards in reading Develop workplace competencies across disciplines

UDL + Math = Exponential Results for our Learners

Sarah Goldammer and Amber Fornaciari

Designing math lessons that infuse the principles of UDL, Universal Design for Learning, promotes self-confidence and improves problem solving and independence. Putting a spotlight on UDL principles already utilized in your classroom and intentionally adding new UDL ideas is more than an addition equation. It results in exponential growth for teachers and learners! Take home ideas to use in your next class, ideas of how to promote engagement and learning, and have fun.

This session will focus on integrating and intentionality with UDL (Universal Design for Learning) while planning and executing math lessons in the adult education classroom. UDL provides a wider lens for learners to use their acquired knowledge through multiple means of action and expression. Although math content is often black and white, the path taken to mathematical understanding, can be a winding road. Providing multiple means of representation can ensure each math learner finds his/her way. This session will explore ways to add UDL or be more intentional in its use to engage learners and promote deeper understanding and application of math concepts. Objectives of presentation Explain the three guiding principles of UDL Explore ways to incorporate UDL principles into the virtual or in-person math classroom Participate in one way to allow choice of expression (call to action)

By combining UDL, a research-based approach to teaching and learning with years of experience teaching math to adult learners, the presenters plan to model the importance of intentionally infusing UDL principles into math instruction. By so doing, our learners will be provided a richer base for understanding, application, and retention. We plan to provide not only modeling and ideas, but also specific resources and lesson plans so teachers can step back into class and immediately start using UDL in their math instruction.

Launching a Professional Development Program to Support Teachers of Adult Numeracy: An Opportunity for States

Kirk Walters, Rebecca Perry, Ann Edwards

The U.S. Department of Education has contracted with WestEd to update the Adult Numeracy Instruction Professional Development Program for teachers of basic mathematics education for adults. This presentation will provide an overview of the new professional development program, ANI 2.0, and share an exciting opportunity for teams of state-based facilitators to participate in the ANI 2.0 field test, receive training to deliver the ANI 2.0 program locally, and earn certification to become ANI 2.0 facilitators.

The proposed session focuses on the Adult Numeracy Instruction Professional Development Program 2.0 (ANI 2.0), funded by the U.S Department of Education's Office of Career, Technical, and Adult Education (OCTAE). The session will include a preview of ANI 2.0, an overview of the program's field test, and an opportunity for participants to ask questions. Attendees will leave the presentation with an understanding of the structure and contents of ANI 2.0, including how it is designed to support adult math learners; knowledge about the ANI 2.0 field test, including information on how to apply for field test participation, what it will entail, and how it will benefit instructors and their students; and answers to any questions that emerge during the session. ANI 2.0 is an intensive evidence-based online professional development program that focuses on effective standards-aligned mathematics instruction for adults. The program, which includes a mix of engaging synchronous and asynchronous activities, is designed to increase states' capabilities to train their own facilitators and build capacity locally.

WestEd will showcase how the ANI 2.0 program is designed to support high-quality math instruction for adults and illustrate for state leaders how participation in the ANI 2.0 field test could benefit students. The course is designed to support math instruction that will help adult math learners successfully navigate transitions to higher education and careers. As ANI 2.0 facilitators learn about key pedagogical concepts, as well as the fundamentals of adult math education, adult students will see the benefits in their academic and professional endeavors. One unique aspect of ANI 2.0 is its strong focus on fostering positive mindsets for adult mathematics learners. The program explicitly addresses issues related to the development of adult students' identity and agency as mathematics learners; the importance of growth mindset and how it can be shifted; and the relationship between a positive mathematics identity for adults and equitable teaching practices.

Addressing the WHY in Mathematics: Get Rid of the Gimmicks!

Lori Lundine, Donna Parrish

Adult students are busy and goal driven. In the name of quick test taking success, it is easy to fall back on mnemonics or math tricks while teaching them mathematics. But are we really doing our students any favors? Research shows that teaching the "Why" in math leads to greater and longer lasting comprehension which can be applied to more than a standardized test. Come learn some ways to teach meaning in Math!

Teaching math to adults is about mindset, need, and application. These drive motivation and success in an ABS math class. Gimmicks that don't make sense do not belong here, adults want to know why the math works and research proves this leads to GED and college transition success. Donna and Lori have years of experience bringing math best practices to life in the ABS classroom and want to share with others what their research, reading, practice and own styles have taught them about real success for students in a math class. Participants will expect to be shown examples of various teaching strategies that work: Number talks, pattern recognition, teaching through solving problems, real world problems. Mathematical Practices at work that develop mathematical reasoning will be employed, and compared to some often used math "tricks" to give instructors a new perspective on teaching math. These along with the awareness of mathematical mindsets and brain research that enlighten learners own insights about their abilities can transform a successful program to one that will push students to try new things, new number play, new goal attainment, new pathways for their careers.

When instructors provide students with transparent mindset and brain research about learning, coupled with content that is deep and applicable, amazing things can happen. Donna and I have had countless students proclaim to "Love" math after being vowed math phobics for the majority of their lives. If instructors embrace the Math Standards concepts of a mile deep instead of the previously used mile wide math content, they will see their students flourish and even learn to love math. If we can ignite some instructors in this philosophical change, their own adult students may change their minds and decide to go into a higher paying STEM career, because they will learn that they can do it.

PIAAC Numeracy Skills and Home Use among Adult English Learners

Margaret Patterson

Adult English learners typically focus on language-related skills, yet large-scale PIAAC data reveal many English learners 25 and older have low numeracy skills too. Come find out how these English learners use numeracy (print and electronic) at home and how use connects with numeracy skills. Session attendees will collaborate on approaches and take away implications for English learner numeracy instruction aligned with instructional guidance from the PIAAC Numeracy Framework.

Research on adult English learners (ELs) typically (and appropriately) focuses on language-related skills. However, ELs may also need instruction in numeracy as adults. Also, little is known about how ELs use numeracy skills in their home lives and the connection of this skill use with related electronic numeracy skills, specifically using spreadsheets and conducting online financial transactions. The purpose of this presentation is to share the numeracy skills and use at home of post-traditional adult ELs from PIAAC. Discrete groups of ELs at various skill levels employ numeracy and electronic numeracy skills in different ways. After a brief slide presentation, participants will discuss findings with peers. Participants will take away implications for instruction aligned with instructional guidance based on the PIAAC Numeracy Framework. Session attendees will also collaborate to put together approaches to numeracy for each discrete group. By session's end, participants will be able to: 1. Summarize findings on numeracy skills and use at home of adult ELs 2. Take away implications for ELA instruction aligned with framework's instructional guidance 3. Collaborate to put together approaches to numeracy for six discrete groups of ELs 4. Follow up with learners, whether through peer discussion or action research, on implementing approaches

In addition to frequently taught skills of speaking, listening, reading, and writing, ELs may need instruction in numeracy as adults, either because they did not have it initially in their home country or because many years have gone by since they first studied it. Because of the focus on language, ELs infrequently receive numeracy instruction. This presentation gives instructors the opportunity to access and think through approaches to teaching numeracy to ELs so that they can consider changing practice to provide numeracy instruction. One of the objectives is to encourage follow-up with learners, whether through peer discussion or action research, on implementing the approaches. To the extent that this objective is met, adult learners learning English will be able to gain numeracy skills and/or participate in action research to influence numeracy instruction in their respective programs.