

NOTICIAS de TODOS

TODOS Newsletter: Mathematics for ALL

Fall 2019, Volume 14 Number 2

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Teaching Mathematics to Students with Disabilities

By Eugenia Vomvoridi-Ivanovic and Laura McLeman

Approximately 13% of public school students in the U.S. receive special education services (McFarland et al., 2017) and 8% of the student population has been identified with a learning disability (LD) in mathematics (Geary, Hoard, Nugent, & Bailey, 2012). Students with disabilities (SwD) have persistently achieved low levels of mathematics mastery. Mathematics achievement scores from the 2015 National Assessment of Educational Progress (NAEP) reveal that 68% of 8th grade SwD are at the below-basic level as compared to 23% of students without disabilities—a gap of 45 percentage points (Kena et al., 2016). This low mathematics achievement for SwD has persisted despite federal mandates (Every Student Succeeds Act (ESSA), 2015; Individuals with Disabilities Education Improvement Act (IDEIA), 2004) and policy statements in support of equity for all students (National Council of Teachers of Mathematics [NCTM], 2000). Equity for SwD is also briefly addressed in the Common Core State Standards (Council of Chief State School Officers [CCSSO], 2010), emphasizing the necessity for SwD to be challenged to excel within the general curriculum and to have access to rigorous academic content standards. Unfortunately, this research on teaching practices that demonstrate efficacy in promoting mastery of the standards for students with SwD has been slow in coming, and student outcome data indicate that current mathematics teaching practices have been inadequate. In fact, it has been documented that teachers often lack both an understanding of and an ability to implement specific pedagogical strategies for students with specific LDs (DeSimone & Parmar, 2006).

It is not uncommon for educators to hold deficit views for SwD, and many SwD are sheltered and protected from ever having to take risks and are never given the chance to engage in grade-level tasks in mathematics (Rodriguez, 2016a). In her news “From the President,” Diana Ceja poses several questions to guide the TODOS 2020 conference theme.

Vomvoridi-Ivanovic and McLeman, continued on page 4

From the President

By Diana Ceja



The TODOS 2020 conference is fast approaching. If you have not been able to attend the past conferences, I encourage you to make the time and a budget to attend. The conference is held in Scottsdale, Arizona, June 25-27 making it the “hottest” conference of the year. We keep the size of the conference small so there is a sense of family, a brave space where those who attend may connect around deeply-felt and high-stake issues around mathematics education.

The #TODOS2020 conference theme is ‘Activating Agency for Student Access, Engagement, and Advancement in Mathematics’ and the conference will give us an opportunity to delve into beliefs and structures, curriculum and instruction, families and communities, and systems and accountabilities. The conference program committee created several questions to guide presenters toward addressing the theme.

Here are a few of the questions to get you thinking: What approaches help you and others interrogate and challenge deficit views about mathematics learning and students’ agency and identity? *Ceja, continued on page 4*

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TODOS Mission Statement

The mission of *TODOS: Mathematics for ALL* is to advocate for equity and high quality mathematics education for all students—in particular, Latina/o students.

The Cibola Greenhouse: A Rigorous Problem-Solving Laboratory

By Anthony Rodriguez
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An old, unused greenhouse in the middle of the campus inspired me to think of all the ways that this building could become a laboratory for inventing, building, and using mathematical models to teach core algebra concepts and skills. My students, a majority of whom are Latino/a, all of whom have disabilities, engaged in project-based learning and transferred habits of hard work and perseverance to the math classroom. My purpose was to motivate and support my students in their work as problem solvers. These students were freshmen at a large, urban, southwestern high school. Many had a history of low attendance, gave up on problems quickly, refused to work, and were suspended often, resulting in failing grades in middle school. Many of them talked about dropping out yet were not ready for a job, nor were they able to pass the GED. As a result, I developed the Cibola Greenhouse and Composting Company as a place to build community, bring out the best work habits of the students and transfer these to the mathematics classroom.

Many people with disabilities struggle with problem solving, lowering their overall mathematics achievement (Krawec et al., 2013). Often, as the level of service within the IEP increases, authentic problem-solving decreases and “canned,” programmatic, and remedial basic skills work increases. This decrease in access to authentic problems removes rigor and relevance from the mathematics often engaging in deficit-oriented teaching of skills. Many teachers wonder why their students in these programs hate mathematics, refuse work, and stop attending classes when in fact this refusal is often the only power they are granted in these classrooms (Daniels & Arapostathis, 2005).

After taking class with me for three years, Daniel, a junior, summed up his experience, “I still remember in ninth grade I really didn’t like coming to school, but with the greenhouse, I am actually doing a lot better. I am passing all my classes with mostly As and Bs.” Celina, a senior, commented that the course “really show[s] me what I am working with, it makes sense to me, and gives me a good picture of the problem in my head. I really liked my projects. I could be very creative.”

Work Habits and Challenge

During an economic downturn in the area, many of the parents of my students took jobs that traditionally went to high school students. One objective of the greenhouse

project, therefore, was to replicate the experience of a paid job in which students learned good work habits. Sustained work in one activity transfers to all endeavors and develops a habit of agency and self-determination (Csikszentmihalyi, 1990; Deci & Ryan, 2000). Project-based learning in the greenhouse activity transferred into the ability to work through challenging mathematics problems.

Similarly, as Stephanie, a senior, bravely admitted, “I learned a lot I didn’t think I would have been able to learn... I took an extra math class in my senior year because, in my opinion, I know I would need it later on in life. So, I took the class to show I was a hard worker, because I wanted to prove that I’m strong and well educated and don’t give up on anything so easy, even though I didn’t need the credit.”

The Transformative Power of Manual Labor

Other programs that emphasize connection to the community and engagement in skilled manual labor have proved effective. The ideas that John Dewey (1938) developed for his Lab School almost a hundred years ago are relevant to today’s increased demands for more prescribed teaching and teaching to the test (Anderson, 2007). Dewey worried about mass-produced curricula, which he believed weakened teachers’ abilities and skills. By developing our own lessons and curriculum, we become stronger in the classroom. Everyone benefits.

Frank Lloyd Wright invited the best architectural minds to Taliesin, in Spring Green, Wisconsin, to master architectural design—and to do chores: milking cows, chopping wood, quarrying stone, sawing planks from trees, sifting sand for mortar, and tending to the vast gardens. Wright wanted to build old-fashioned work habits in his apprentices through manual labor. Only after many hours toiling at this repetitive, physically demanding work would they earn a seat at the drafting table to be taught by the master and to “learn by doing” (Taliesin Fellows, 2012).

When Malcolm Beck looked out at the vast, inexpensive land in San Antonio, Texas, and unlimited quantities of local recyclable farm waste, he saw an opportunity. He created Garden-Ville—a multimillion-dollar composting business supplying the soil amendments for a Texan’s passion for growing championship-caliber roses (Beck , 1997). Inspired by the work of these individuals, I saw that this empty one-seventh-acre, weed-infested space in the middle of campus had this same potential—to be transformed into my own versions of Taliesin, Lab School, and Garden-Ville to shape the habits and dispositions of my freshman algebra students.

Get to Work!

Fashion-conscious high school students might object to sifting compost, pruning, weeding, carrying water 100 yards to 1500 growing plants, and loading a yard of soil on the back of a truck. Alex and Matt, both juniors, captured the essence of many students' resistance to the work: "You get dirty and stink . . . at first I hated [the] greenhouse because of the manual labor, but you grow up and get over it."

Over time, the physical, tough, and often dirty work centered these students; it allowed them to burn fuel and work out tensions that previously would have ended up in office referrals, avoidance of work, and other unproductive habits. The greenhouse harnessed their abilities in ways that traditional mathematics programs do not. After working with their hands in the hot Southwest sunshine, these students knew that they could solve mathematics problems in the comfort of an air-conditioned portable classroom.

With High Expectations and Support Come Tangible Gains

Many students with disabilities are sheltered and protected from ever having to take risks (Perske, 1972), are unable to work outside their comfort zone, and are never given the chance to engage in grade-level tasks in mathematics (Rodriguez, 2016). Sadly, many Latino/a students are also given lowered expectations based on their multilingual skills and color. When educators reduce demands on either of these students, they are grossly underestimating students' capacity to recover from failure, reconstruct a new strategy to work with, and ultimately succeed in school.

These habits of determination and toughness generalized to sense making and perseverance in their mathematics work within my Algebra class. In addition, when it came time for the eleventh-grade standardized test (New Mexico Standards Based Assessment [NMSBA]), my students scored higher than expected. They had the highest improvements in our district, resulting in commendations of our special education students and an A rating of our school by the state, the only area high school with such a rating with our demographics. From the success that our students had on the NMSBA test, we also secured a \$30,000 Intel innovation grant for the rehabilitation of our greenhouse, which needed significant repairs. Many students, who three years earlier were ready to drop out of school, scored proficient on the test. In addition, these students took an elective pre-calculus class their senior year, ensuring their right to mathematics literacy (Moses & Cobb, 2001).

My students were just like all other high school students in their initial reluctance. However, their experiences proved malleable over time. I saw in these students what my first

employers must have seen in me—a work in progress, for sure; however, when placed in a position of responsibility, I grew into the job, and my students did too. I am very proud of them. Edward, a junior, captured this sense of achievement: "It was a wonderful experience, I met a lot of great people, and it felt great doing some good and productive things for the community."

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Save the Date! June 25-27, 2020

TODOS 2020 Conference: Activating Agency for Student Access, Engagement, and Advancement in Mathematics. See more on page 5.

The first question is about interrogating and challenging deficit views about students' mathematics learning, agency, and identity. As you reflect on this question, we urge you to consider how the question applies to SwD. A resource we think you will find useful is the article by Anthony Rodriguez included in this newsletter, "The Cibola Greenhouse: A Rigorous Problem-Solving Laboratory" (note: this article is a condensed version of another article [Rodriguez, 2016b] published in *The Mathematics Teacher*). In his article, Anthony Rodriguez challenges deficit views for students with learning disabilities (SwLD) by demonstrating how project-based mathematics learning and skilled manual labor may help SwLD develop dispositional habits and learn rigorous mathematics content.

As educators, we are advocates for all students. Within the realm of mathematics teaching and learning then, we must challenge our notions about who can do mathematics and how we might support each and every student to see themselves as doers of mathematics. With that in mind, we hope that you will find the contents of this issue to be meaningful. As always, if there is a message you would like to share with the TODOS community, and/or a specific topic or issue aligned with the TODOS mission that you would like to see addressed in a future newsletter, please do not hesitate to contact us. Thank you!

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Caja, continued from page 4

How can mathematics educators create equitable P-12 school structures in mathematics, confronting the impact of student and teacher tracking? What are authentic ways of building trust and relationships with students, families, and communities? How do educational decision makers create accountability mechanisms for classrooms, schools, and districts that uplift students to learn rigorous and relevant mathematics?

Hope to see you in Scottsdale.

Financial Support Available to Attend the TODOS 2020 Conference!

Due March 1st. See (1) [2020 Cathy Kinzer Memorial Professional Development Award](#) (must be a TODOS member as of September 1, 2019). (2) [TODOS 2020 Teacher Award](#) (must be a TODOS member as of January 1, 2020).

**2018 Iris M. Carl Equity and Leadership Awardee:
Dr. Kathryn Chval**



The TODOS Iris M. Carl Equity and Leadership Award recognizes an individual who has made significant contributions to the quality of mathematics education provided to underserved students, in particular to Latina/o students. We are honored to congratulate Dr. Kathryn Chval on being awarded the 2018 Iris M. Carl Equity and Leadership Award. Dr. Chval currently holds the Joanne H. Hook Dean's Chair Renewal in the University of Missouri College of Education where she is also a Professor of Mathematics Education whose research focuses on effective preparation models and support structures for teachers, effective elementary mathematics teaching for English language learners, and curriculum standards and policies. Furthermore Dr. Chval has directed or co-directed research teams that received over \$20 million in funding. As a researcher she has contributed to the field of mathematics education by authoring more than 60 research publications including 17 books and is the recipient of the prestigious NSF Early Career Award and the Association of Mathematics Teacher Educators Early Career Award.

TODOS 2020 Conference & Preconference

TODOS 2020 Preconference (June 25): Change Agents Taking Action on Equity in Mathematics Education

TODOS 2020 Conference (June 25-27): Activating Agency for Student Access, Engagement, and Advancement in Mathematics.

The conference will include a variety of session types, including both invited and peer reviewed, that range in length and format. The following four strands of 1) Beliefs & Structures, 2) Curriculum & Instruction, 3) Families & Communities, and 4) Systems & Accountability will guide the positive environment that will facilitate everyone's learning during the conference. Throughout the conference, there will be many opportunities to discuss ideas from the sessions, consider how we move beyond awareness, and enact changes in our settings that address equity, access, and achievement for all.

The conference asks for all participants to reflect on the following question:

"How well did the presentation help you reflect on specific actions you will take connected to our theme: Activating Agency for Student Access, Engagement, and Advancement in Mathematics?

Conference Overview

- Thursday June 25, 2020 5:00 – 8:00. Conference opening session, keynote, and reception.
- Friday, June 26, 2020. 8:00 – 5:00. Opening session followed by a variety of sessions and networking Friday: Breakfast and lunch included; dinner is on your own.
- Saturday, June 27, 2020. 8:00 – 4:30. Variety of sessions and interactions. Saturday: Breakfast and lunch are included.



CONDOLENCE MESSAGE

It is with our deepest sympathies that we inform you of the recent passing of Dr. Karen Denise King. Dr. King passed away on December 24, 2019 after her battle with liver cancer. Dr. King was a leader in our field and she will be sorely missed. We encourage you to read the heartfelt tribute to Dr. King's legacy posted on AMTE's Facebook page at <https://tinyurl.com/KarenDKing>.

TODOS: Podcast

<https://todosmath.podomatic.com/>

Make sure to take a listen or re-listen to the TODOS Equity & Social Justice in Mathematics for ALL Podcasts.

Episode 1: Committing to Social Justice an Interview with Julia Aguirre

Catch host Dr. Maria Zavala interview Dr. Julia Aguirre, to reflect on the history of the TODOS and the National Council of Supervisors of Mathematics (NCSM) joint statement on social justice in mathematics education and the continued need for educational leaders to commit to social justice in mathematics.

https://www.podomatic.com/podcasts/todosmath/episodes/2019-09-14T09_29_20-07_00

Episode 2: Ethnomathematics is Mathematical for ALL

Listen to authors of the TODOS blog entry

"Ethnomathematics: Mathematics de TODOS" Carlos LópezLeiva, Kyndall Brown, and Silvia Llamas-Flores describe what ethnomathematics is, and provide practical advice for teachers on how to get started with expanding the mathematics of their classroom

https://www.podomatic.com/podcasts/todosmath/episodes/2019-09-15T12_43_21-07_00

Episode 3: Flashback to 2014 TODOS Conference Closing

This episode flashes back to audio recorded in 2014 at the first ever TODOS Conference where mathematics education leaders Rochelle Gutiérrez and Kathryn Chval cohosted a closing session to reflect on key ideas and themes from the conference.

https://www.podomatic.com/podcasts/todosmath/episodes/2019-10-28T18_44_20-07_00

2020 NCTM Annual Meeting and Exposition

TODOS has been invited to contribute to the 2020 NCTM Annual Meeting and Exposition in St. Louis, MO, October 21-24, 2020 by accepting up to **four** 60-minute-sessions and **two** 75-minute gallery workshops. If you submitted a proposal to be considered for the TODOS Strand at the 2020 NCTM Annual Meeting and Exposition in St. Louis, MO, October 21-24, 2020 by the December 16 deadline, then the TODOS Conferences Committee will review the proposals for the TODOS Strand and will notify you regarding your status for the strand by Friday, December 27. The TODOS Conferences Committee may suggest edits to your proposal to help clarify or strengthen your title and description.

If you missed the TODOS strand deadline of December 16, 2019, you may still submit a proposal directly to NCTM for general consideration by the NCTM Program Committee until February 1, 2020.

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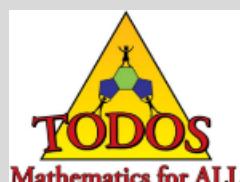
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José Martínez Hinestroza and Ricardo Martinez (co-editors).

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The publications of TODOS present a variety of viewpoints. The views expressed or implied in this publication, unless otherwise noted, should not be interpreted as official

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Student Awards

National Council of Teachers of Mathematics (NCTM) Conference San Diego, CA (April 2019)

Nicole C., 10th grade student at Castle Park High School, Sweetwater Union High School District

Nominating Teacher: Mr. Emmanuel Gutierrez

Melissa S., 10th grade student at Castle Park High School, Sweetwater Union High School District

Nominating Teacher: Mr. Emmanuel Gutierrez

Alanna B., 12th grade student at El Capitan High School, Grossmont Union High School District

Nominating Teacher: Ms. Sherry Trochta



Standing from left to right: Diana Ceja (TODOS President), Donald Tunstall (TI Representative)

Seated from left to right: Alanna B., Melissa S.
Not pictured: Nicole C.

Ohio Council of Teachers of Mathematics (OCTM) Conference Sandusky, Ohio (October 2019)

Spencer K., 8th Grade Student at Sandusky Middle School, Sandusky City Schools

Nominating Teacher: Mr. Tony Esposito



Standing from left to right: Spencer K., Mr. Tony Esposito