High Impact Strategies for Sustaining Girls’ Academic Interest, College and Career Pursuits in Mathematics
(An Asset-Based, Whole Child Approach)

Lorraine Howard, President, Women and Mathematics Education (WME)
July 16, 2020
WME’s MISSION: To advocate for equity and high-quality teaching and learning of mathematics for all students, especially related to girls, women and URMS.

Girls + Math = POWER!

Partner Affiliate of:
Identity, Agency, and Positioning
Why they matter in mathematics

Part I
Women and Mathematics Education
sponsored
100 Days of PD webinars
June 16, 2020

Claudia Bertolone-Smith, Ph.D.
California State University, Chico

Lynda Wiest, Ph.D.
University of Nevada, Reno

Heather Crawford-Ferre, Ph.D.
Nevada Dept. of Education
# How are you feeling?

<table>
<thead>
<tr>
<th>Livid</th>
<th>Panicked</th>
<th>Frustrated</th>
<th>Shocked</th>
<th>Stunned</th>
<th>Energised</th>
<th>Thrilled</th>
<th>Ecstatic</th>
<th>Euphoric</th>
<th>Exhilarated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enraged</td>
<td>Terrified</td>
<td>Peeved</td>
<td>Worried</td>
<td>Annoyed</td>
<td>Positive</td>
<td>Connected</td>
<td>Joyful</td>
<td>Enthusiastic</td>
<td>Elated</td>
</tr>
<tr>
<td>Irate</td>
<td>Frightened</td>
<td>Angry</td>
<td>Nervous</td>
<td>Concerned</td>
<td>Glad</td>
<td>Inspired</td>
<td>Happy</td>
<td>Motivated</td>
<td>Excited</td>
</tr>
<tr>
<td>Furious</td>
<td>Anxious</td>
<td>Agitated</td>
<td>Unsure</td>
<td>Excluded</td>
<td>Amused</td>
<td>Focused</td>
<td>Cheerful</td>
<td>Proud</td>
<td>Surprised</td>
</tr>
<tr>
<td>Disgusted</td>
<td>Scared</td>
<td>Troubled</td>
<td>Restless</td>
<td>Uneasy</td>
<td>Satisfied</td>
<td>Pleased</td>
<td>Hopeful</td>
<td>Optimistic</td>
<td>Lively</td>
</tr>
<tr>
<td>Apprehensive</td>
<td>Ashamed</td>
<td>Guilty</td>
<td>Deflated</td>
<td>Complacent</td>
<td>Easy-going</td>
<td>Safe</td>
<td>Chilled</td>
<td>Respected</td>
<td>Blessed</td>
</tr>
<tr>
<td>Sullen</td>
<td>Glum</td>
<td>Disheartened</td>
<td>Discouraged</td>
<td>Bored</td>
<td>Relaxed</td>
<td>Secure</td>
<td>Content</td>
<td>Thankful</td>
<td>Fulfilled</td>
</tr>
<tr>
<td>Exhausted</td>
<td>Fatigued</td>
<td>Sad</td>
<td>Miserable</td>
<td>Pessimistic</td>
<td>Thoughtful</td>
<td>Composed</td>
<td>Calm</td>
<td>Grateful</td>
<td>Tranquil</td>
</tr>
<tr>
<td>Alienated</td>
<td>Depressed</td>
<td>Disappointed</td>
<td>Tired</td>
<td>Confused</td>
<td>Mellow</td>
<td>Peaceful</td>
<td>Balanced</td>
<td>At Ease</td>
<td>Collected</td>
</tr>
<tr>
<td>Despair</td>
<td>Inconsolable</td>
<td>Anguished</td>
<td>Hopeless</td>
<td>Lonely</td>
<td>Listless</td>
<td>Sleepy</td>
<td>Restful</td>
<td>Comfy</td>
<td>Serene</td>
</tr>
</tbody>
</table>
Where are we headed?
Our goal--

- Address the need for accelerating the science of human development into the teaching and learning of mathematics, especially as related to girls;
- Identify the Whole Child Approach and associated SEL competencies, their effective teaching and learning strategies and best practices for engaging and transforming girls’ sustaining approach in learning mathematics; and
- Enhance your personal/professional ONE THING Action Plan!!!!
In the chat share:
What picture(s) come to mind when you think of:

A STUDENT THRIVING ACADEMICALLY?
In the chat share:

What picture(s) come to mind when you think of:

A STUDENT THRIVING PHYSICALLY?
In the chat share:

What picture(s) come to mind when you think of:

A STUDENT THRIVING in their MENTAL HEALTH and WELLNESS?
Depression
Stress
Concentration
Anger
Loneliness
Sadness
Studying
Anxiety
Identity
Motivation
Drugs
Alcohol
Assault
Worry
Abuse
Family
Rejection
Sexuality
Relationships
Overload
In a Pew Research Center Survey of U.S. Teens ages 13 to 17, 96% named depression and anxiety as a problem among their peers. 70% of them name it as a major problem.
Systemic Social and Emotional Learning

SEL can be more than just a 30-minute lesson. A systemic approach to SEL intentionally cultivates a caring, participatory, and equitable learning environment and evidence-based practices that actively involve all students in their social, emotional, and academic growth. **This approach infuses social and emotional learning into every part of students’ daily lives**—across all of their classrooms, during all times of the school day, and when they are in their homes and communities.
Which of these skills need to be taught?
Five top skills to have a successful future:

<table>
<thead>
<tr>
<th>Parents</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mental health</td>
<td>Reading</td>
</tr>
<tr>
<td>2. Reading</td>
<td>Perseverance</td>
</tr>
<tr>
<td>3. Listening Skills Mindset</td>
<td>Growth</td>
</tr>
<tr>
<td>4. Strong relationships</td>
<td>Strong</td>
</tr>
<tr>
<td>Relationships</td>
<td>Mental Health</td>
</tr>
</tbody>
</table>

The majority of parents (67%) and teachers (75%) believe that teachers are responsible for imparting more than academic knowledge, like how to build healthy relationships.
Wait a minute!!!
You’re telling me I have to teach SEL and Whole Child concepts too?

You’re kidding, right?
SEL: What Does the Research Say?

• Students with SEL training scored **13 points higher** academically than their peers 3.5 years later.

• Had **6 percent better** high school graduation rates; and

• Could even reap lifelong **monetary benefits** for their healthy adult lifestyle.
SEL: What Does the Research Say?

• Improved Behavior
Studies show decreased dropout rates, school and classroom behavior issues, drug use, teen pregnancy, mental health problems, and criminal behavior.
## Leadership Challenges of Restorative Practices

<table>
<thead>
<tr>
<th>Traditional Discipline</th>
<th>Restorative Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>School and rules violated</td>
<td>People and relationships violated</td>
</tr>
<tr>
<td>Justice focuses on establishing guilt</td>
<td>Justice identifies needs and obligations</td>
</tr>
<tr>
<td>Accountability = punishment</td>
<td>Accountability = understanding impact, repairing harm</td>
</tr>
<tr>
<td>Justice directed at offender, while victim is ignored</td>
<td>Offender, victim and school all have direct roles in justice process</td>
</tr>
<tr>
<td>Rules and intent outweigh whether outcome is positive/negative</td>
<td>Offender is responsible for harmful behavior, repairing harm and working toward positive outcome</td>
</tr>
<tr>
<td>No opportunity for remorse or amends</td>
<td>Opportunity given for amends and expression of remorse</td>
</tr>
</tbody>
</table>
PREVENTION vs. INTERVENTION
Creating Environments for Learning

SEL is a deeply ingrained part of the way students and adults interact both in the classroom and out of it, and helps provide children with equitable, supportive, and welcoming learning environments.
STRATEGIES
Only 52% of students believe their teachers know their name.

National Student Voice Data Results, 2016
Our Classroom Promises

1. We will make choices that help us do our best learning!
2. We will be kind and take care of each other!
3. We will do our best and keep trying, even when things get tough!
Help students identify and label emotions.

Pultchik’s Wheel of Emotions
Conduct emotional check-ins to build students’ ability to accurately predict and label emotions.

1. How do you feel at the start of the school day?
2. What emotions do you feel throughout the day while learning?
3. Do you feel differently when walking in the hallway, sitting in the lunchroom, or at recess or passing period?
4. How do you feel at the end of the school day?

Brackett and Frank (2017)
Overcoming Mathematics Anxiety

- **Do math every day.** Schedule quality study time throughout the week and stick to your schedule.

- **Study smart.** Read the information on study skills, time management, note-taking and textbook-reading on this website or in one of the math study skills books.

- **Attend class.** You will see examples that are not in the textbook. You are responsible for all information and concepts presented in class, whether you are present or not.

- **Get organized!** You need to keep good class notes. You need to keep a good math notebook with lists of vocabulary, properties, formulas, theorems and procedures. Must anxiety is caused by disorganization.

- **Continually test yourself.** Be aware of what you know and of what you don’t know.

- **Replace negative self-talk with positive self-talk.** Be mindful of what you are saying to yourself. Develop positive affirmations such as “I will succeed in this course!” or “I love math!” to counteract any negative feelings you may have about your abilities or about math itself.

- **Utilize all your resources.** Internet, textbook, friends, study groups, your instructor, the internet....all are available to help you succeed.

Adapted from http://missioncollege.org/depts/math/resources/math_anxiety.html
Managing
My
Emotions
Wheel

I feel sad
I need To use positive self-talk
I can cool off by...

- Squeezing my hands
- Listening to music
- Putting my head down or taking a break
- Taking five deep breaths
- Thinking happy thoughts
- Walking away
- Getting a drink of water
- Talking to an adult
How was my behavior today?

Was I on task the whole time?

Did I respect my classmates?

Did I respect my teacher?

Did I try my best on my work?
Replacement ideas
How have you helped students identify and regulate emotions? What are you doing differently for distance learning?
Learning: an active process in which students construct new ideas or concepts based on their current knowledge.

Relationship
Build relationships with 2 x 10’s

2 minutes a day
10 days in a row
Talk about anything EXCEPT school or work

Every student deserves a great teacher not by chance, but by design.
Empathetic Feedback is
Growth-oriented
Real
Empathetic
Ask
Timely

GREAT!
Some Components of Empathetic Feedback

- Tell them one thing that they did well
- Use “micro-feedback” (start/stop/continue)
- Include “we” statements (we can work on ....)
- Thank the person
- Obtain feedback on the feedback
How can you integrate empathetic feedback in your work?
Mathematics Learning is Social Emotional Learning

Better Together
How math is taught matters

Messages, myths, and stereotypes compounded by the dry & abstract way math is traditionally taught

- Girls need to understand “why” in addition to “how”
- Girls have a greater desire for understanding than boys, and higher levels of anxiety when they do not achieve it
- Girls succeed with hands-on experience, such as
  - Project-Based, Active Learning,
  - Real-life, authentic applications, and
  - Opportunities for team, collaborative work
Percentage of Students Engaged in School, By Grade
(n = 928,888)

What is PBL? (Authentic Learning Experience)

Project Based Learning (PBL) is a teaching method in which students learn by actively engaging in real-world and personally meaningful projects.

- AUTHENTIC
- RELEVANT
- CONNECTED
We all know education is about learning, right? And “school” has been an official space for learning (i.e. government-funded) since the 1920s. But, what if “school” as we know it didn’t exist? 

What if you woke up each morning with the goal to “learn” by pursuing your interests, curiosities, and passions? What would your day look like? Ultimately, if you had primary ownership over the design of your education, what would learning look like for you?

Using your unbounded creativity, inventive imagination, and knowledge about yourself as a learner—and the genius that you are—this is your opportunity to share what the future of education could (and possibly should) be. Need a little inspiration to get started? Consider these questions:

- What are you curious to know more about?
- What interests and passions would you explore?
- Where would you explore them?
- Who would you interact and engage with?
- Who would you learn from?
- Who might you teach the knowledge and skills you’re learning about?
- When would learning occur?
- Through your explorations and learnings what impact/change do you want to see in your community, the world?
ACTIVITY

AN EXAMPLE OF AN AUTHENTIC PROJECT LEARNING EXPERIENCE

Upper Level Grades

**Vital Question:** How can we rebuild our country’s infrastructure to handle a future worldwide crisis?

Elementary grade

**Vital Question:** How can we make sure our family/school/community is prepared for a disaster?
Action Plan

- Who? YOU
- What? Effective Teaching Strategies
- When? Everyday, **ALL** the time
- How? Strategies shared here for starters
EXTENDED LEARNING ON EDMODO

WME- High Impact Mathematics Teaching & Learning Strategies

AND

PROJECT-BASED LEARNING PRIMER

www.edmodo.com

EDMODO CODE: 6shniy
CONTACT INFORMATION

LORRAINE HOWARD
President, Women and Mathematics Education (WME)
267-992-1612 (Direct)

lorraine.howard@womenandmath.org

www.womenandmath.org
Join Us in our Work!!!
WME’s MISSION: To advocate for equity and high-quality teaching and learning of mathematics for all students, especially related to girls, women and URMS.

Girls + Math = POWER!

Join Us in our WORK!!
Wishing you good teaching!