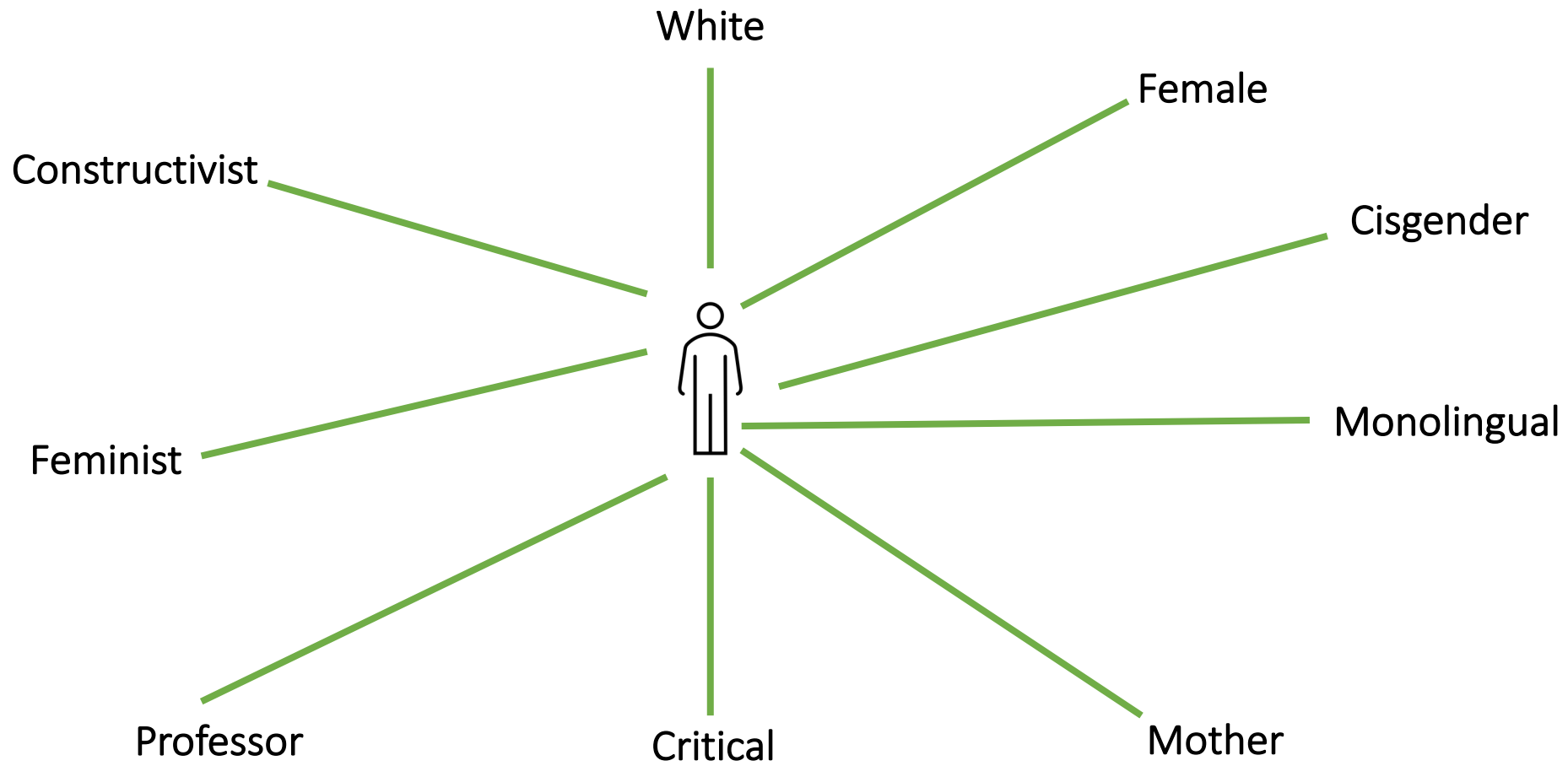


Culturally Responsive Mathematics Teaching

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Overview of Today's Presentation

- My journey and brief overview of my research agenda
- Discussion of CRMT cornerstones
- Some examples from the classroom that inform the framework
- A fieldwork experience (current project) that helps to foster these dispositions in teacher candidates



My Research Agenda

I strive for a collaborative, transdisciplinary approach that has developed over time. I make a strong effort to connect research and practice.

Culturally Responsive Mathematics Teaching

- Grounded theory/community nominations/studying what works
- Informs work with PTs

Professional Development of K-college Teachers

- Focus on fostering equity stance
- Teacher inquiry and book/lesson study

Community-Based Efforts

- Parent tutoring programs
- Funds of Knowledge Approach



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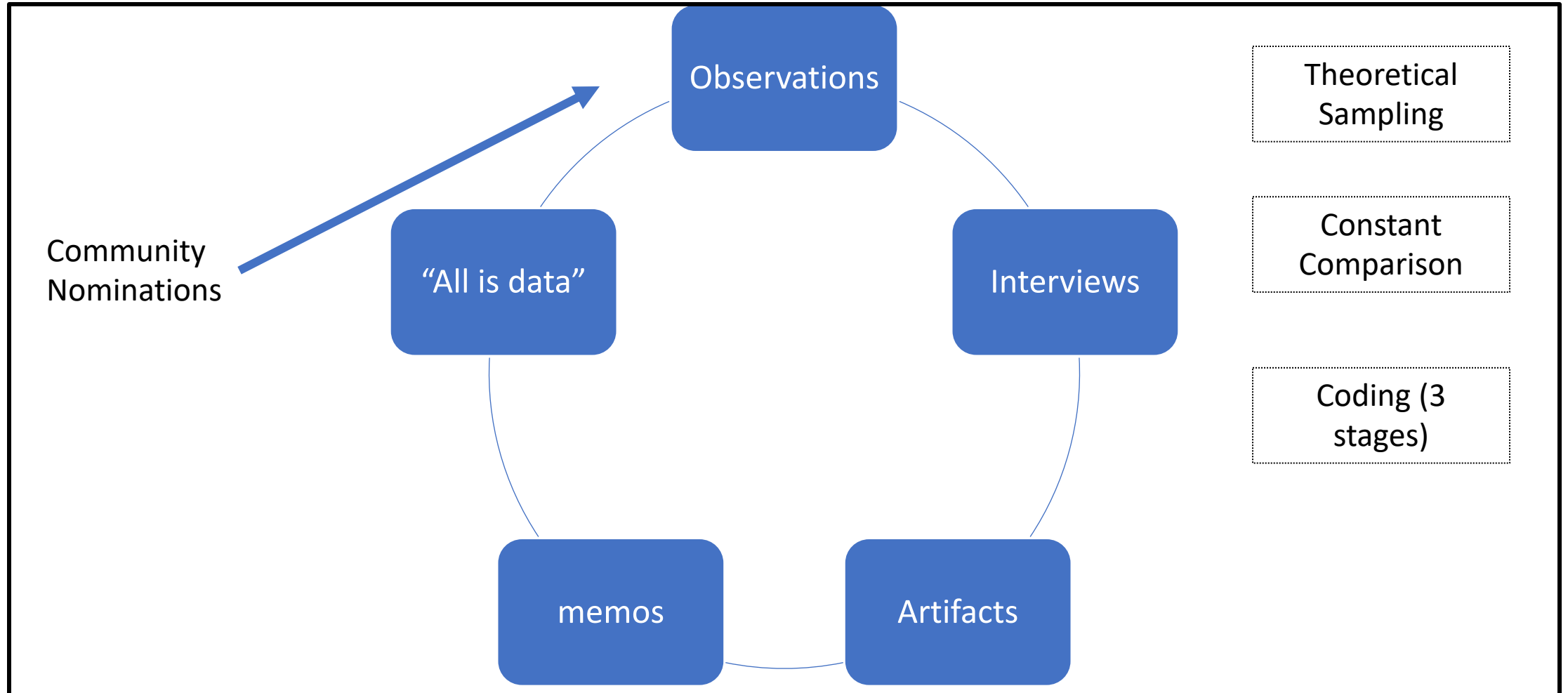




My Journey with CRMT

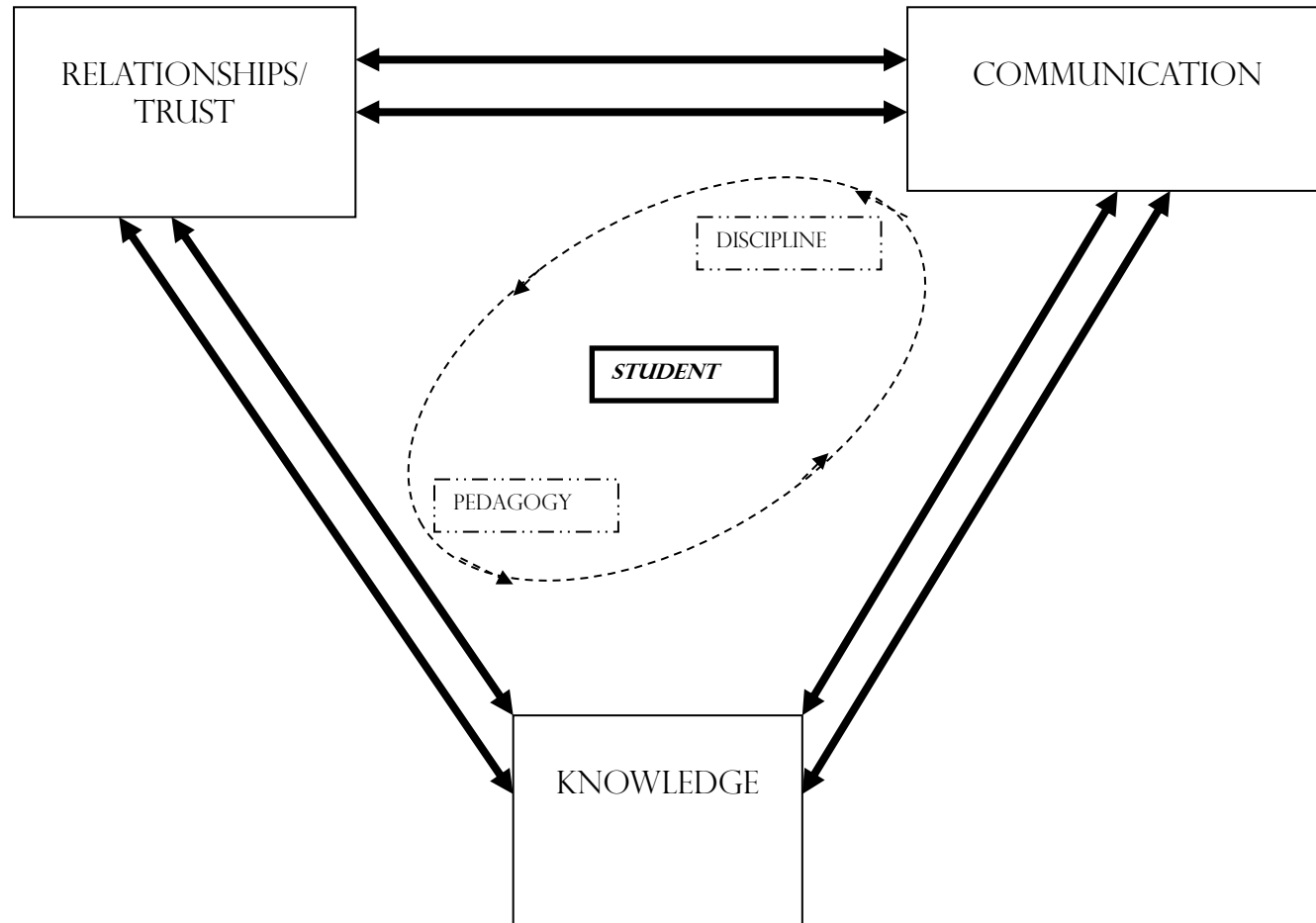
- Teacher prep - SLAC
- HS Teacher in Houston, TX
- Graduate school in Florida
 - Complete re-evaluation of everything I had learned
 - Gloria Ladson-Billings
 - Additional Participants

Research Approach – Grounded Theory



2 years pass...

Culturally Responsive Mathematics Teaching (CRMT)



2 years pass...

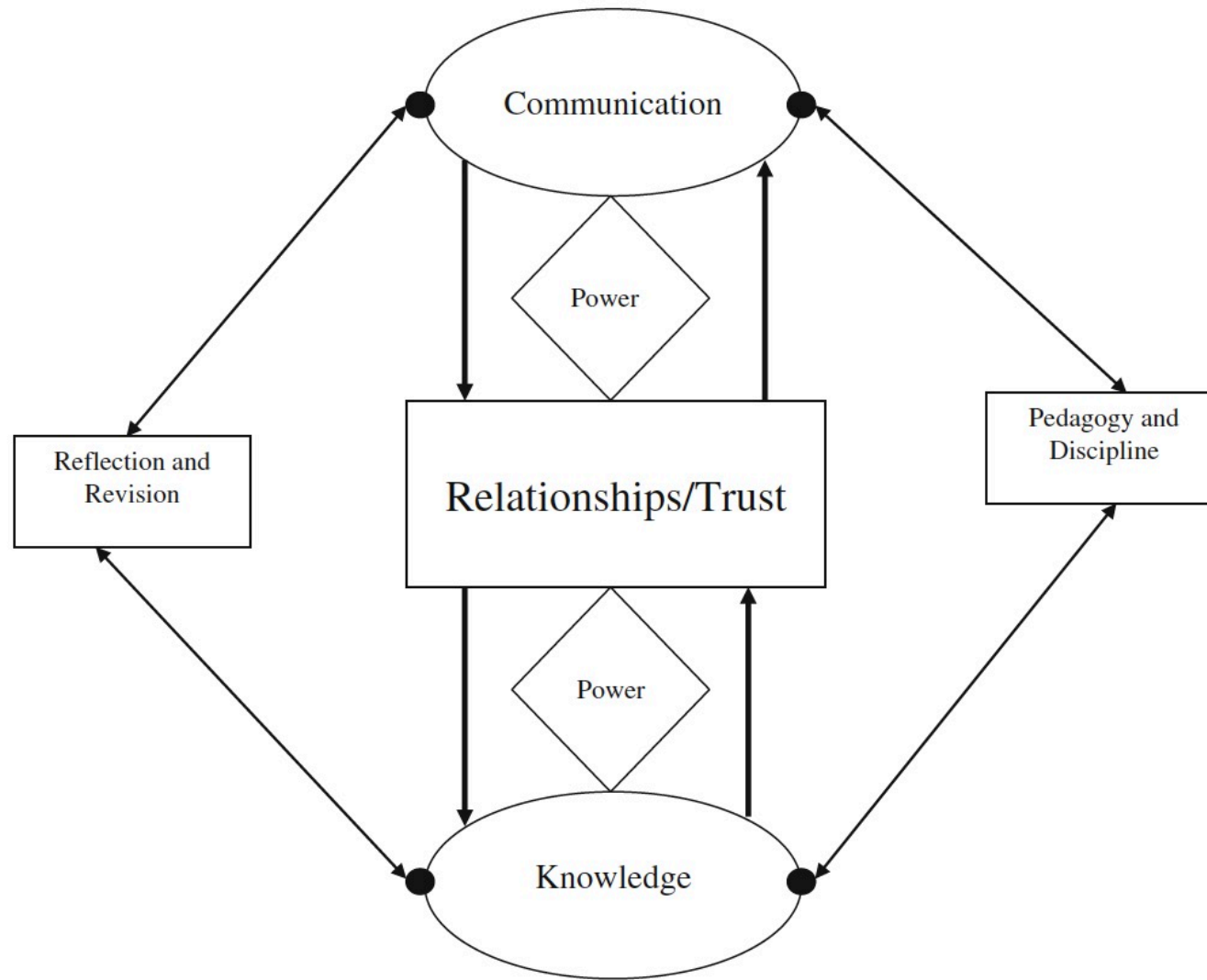
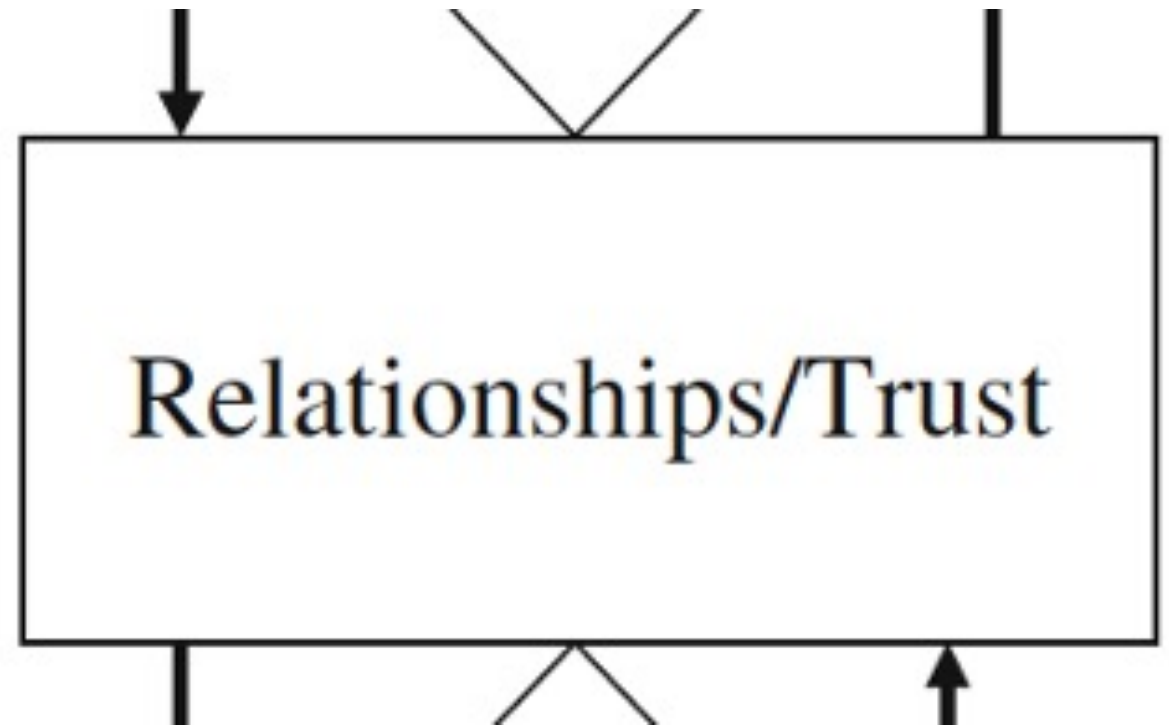
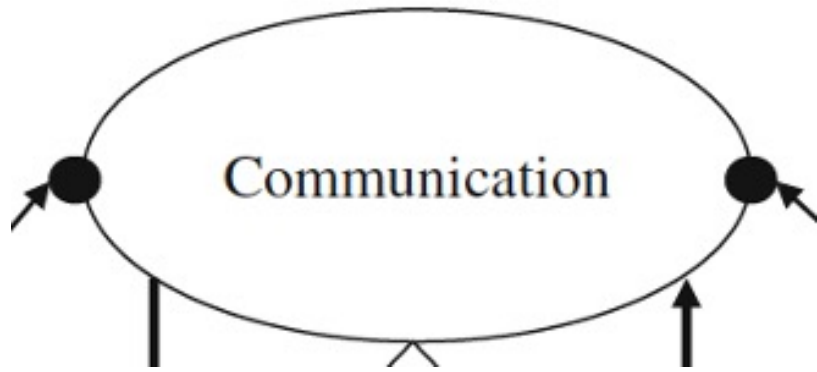


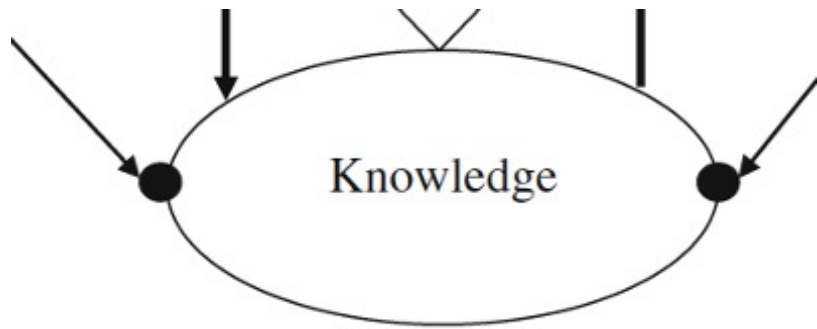
Fig. 1 Culturally responsive mathematics teaching

-
- Foundational
 - Built through other cornerstones
 - Trust comes through effective communication and knowing students
 - Without this, the theory is not sound

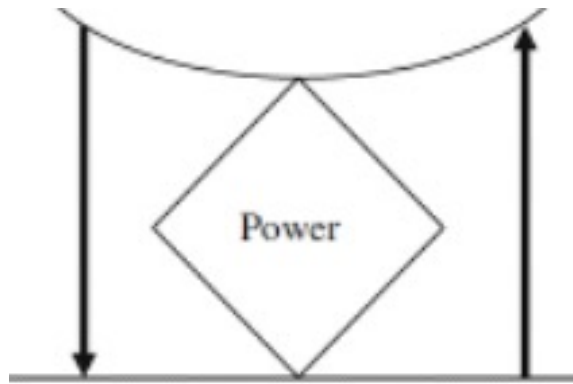




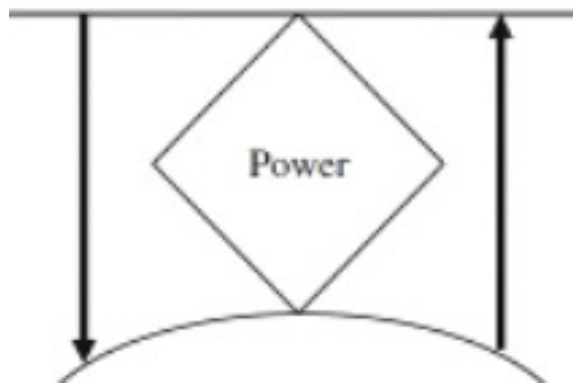
- Culturally situated
- Is vital to building relationships
- Is an “entry point” for building relationships and shifting power dynamics
- Is verbal and non-verbal
- Includes communities (not just students)
- High expectations



- Includes knowledge about students, community, mathematics, pedagogy, etc.
- Significant interplay with communication
- Is foundational to relationships and trust building
- Is an entry point
- Mediates power dynamic



Relationships/Trust



- Power dynamics are fluid and always changing
- Solid foundations allow for this
- Result is empowered students and educator
- This “holds up” the interplay between the cornerstones (with trust, students will share more, allowing us to learn more, and as a result trust is even stronger)

Reflection and
Revision

- More specific practices of the educator
- Don't look the same in each classroom
- Discipline refers to engagement and actions in the classroom
- All teachers were reflective
- Tough love was a constant
- Culturally situated

Pedagogy and
Discipline

What does this look like in practice?

Case 1

- Predominately Black community in Florida
- Chanting, rhythm, performative
- Teacher-led, highly participatory
- Storytelling, rigorous

Case 2

- Predominately Hispanic population in TX
- Motherly
- Group-oriented, problem-solving atmosphere
- Storytelling, FOK

Case 3

- Diverse, all girls middle school in TX
- Active, structured
- Combination of group and teacher-led, movement
- Focus on methods, discussion

How do we foster CRMT in mathematics teacher education (MTE)?

- Working from **cornerstones** (or foundational ideas) rather than specific practices
- Emphasizing **relationships** and **trust** with students
- Shifting **power** dynamics in MTE
- Considering **fieldwork** and potential non-examples students are seeing

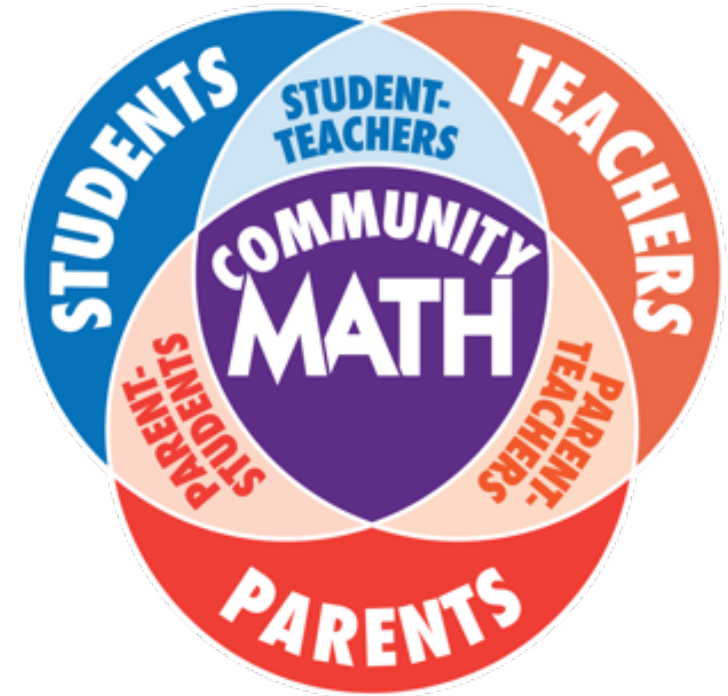


Impactful
Fieldwork -
Community
Mathematics
Program

Parent/guardian tutoring program

Overview

- One-on-one tutoring for parents with a prospective EC-6 teacher
- Eight-week program, flexible meeting times
- Focus on number sense, operations, fractions, and decimals
- Emphasize sense-making and using everyday items/manipulatives
- Design tasks around what is already happening in the home
- Incentives for participation when we can get donations
- Pláticas
- Data include pre/post tests, observations, interviews, focus groups, artifacts, and recordings of various sessions
- Prospective teachers go through a 4 week training program



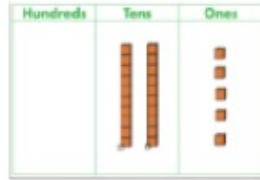
Radesh

Homework

There are 4 doctors working in a clinic. Each doctor has 2 nurses assisting them. There are two receptionists, Jay and Molly, working at the reception. How many people are working in the clinic?



Manipulatives



Directions:
Work this problem with your daughter, record it, and share through remind or email

The manipulatives website:
http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html

Fig. 4a

There are 4 doctors working in a clinic. Each doctor has 2 nurses assisting them. There are two receptionists, Jay and Molly, working at the reception. How many people are working in the clinic = 14

Doctor = 4
Nurse = $4 \times 2 = 8$
Reception = 2

12
14

Hundreds	Tens	Ones
	1 rod	4 units

14

14

1	2	3	4
1	1	1	1
2	2	2	2
3	4		

$12 + 2 = 14$

Fig. 4b

Fractions

Multiply or divide by a whole number to get an equivalent fraction.

1/2 = 2/4

1/3 = 2/6

1/4 = 2/8

1/5 = 2/10

1/6 = 2/12

1/7 = 2/14

1/8 = 2/16

1/9 = 2/18

1/10 = 2/20

1/11 = 2/22

1/12 = 2/24

1/13 = 2/26

1/14 = 2/28

1/15 = 2/30

1/16 = 2/32

1/17 = 2/34

1/18 = 2/36

1/19 = 2/38

1/20 = 2/40

Fig. 4c

Elsa

Decimales

VAMOS DE COMPRAS!

Cuantos juguetes para regalos puedes comprar con \$25.00?



**Puedes usar una revista de compras.

Restar - Si tenia \$25.00 pero compre un carrito de \$5.75 y una muñeca de \$3.25, cuanto dinero me queda?

Multiplicar- Compre 8 trenes de \$2.00, cuanto dinero gaste?

Dividir- Tengo \$25.00 y tengo que comprar regalos para 4 niños, si quiero gasta lo mismo en cada niño cuanto dinero tengo que gastar en cada uno?



Gabriela

Activity 3

Materials: Pizza slices, paper and pencil or white board and markers

Instructions:

1. Parent: Ask questions such as: "If I give you a slice, what fraction of the pizza do you have?" "What if I give you another slice?" "What if I take one away?"
2. Student: Have them add/subtract the pizza fractions
3. Keep track of answers on paper or white board



Fig. 9a At-home activity



Fig. 9b Cutting the pizza to reflect on fractions



Fig. 9c Subtracting fractions with pizza

Big Ideas to Consider...

Cornerstones (theory) should be there in each classroom, but the way the cornerstones are enacted varies widely

Culturally responsive teaching often develops over time (just like many other ideals that drive pedagogical decisions)

CRMT is a framework and not a prescribed set of practices

Cornerstones are meant to provide entry points to developing as a CR teacher

CR Mathematics Teachers:

Operate from a particular belief system

Know their students (consciousness or racial and cultural identity)

Do not ask students to abandon their home culture and give students tools to succeed while maintaining a strong racial identity

Constantly reflect and revise lessons and patterns of communication

“Work” beyond the classroom

Thanks!

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