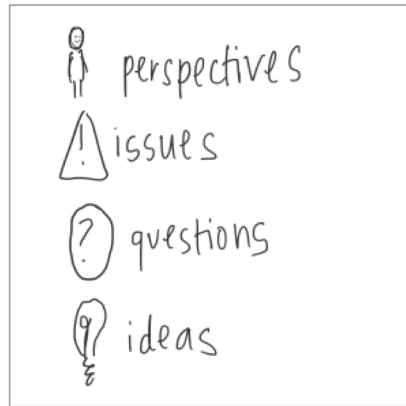


A SKETCHBOOK ON

ESSENTIALS of EFFECTIVE COMMUNICATION



SEEK TO UNDERSTAND



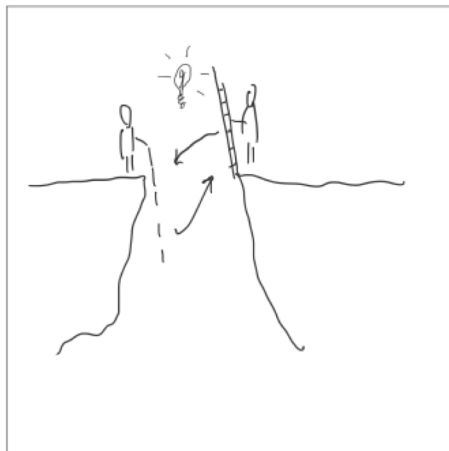
FOCUS



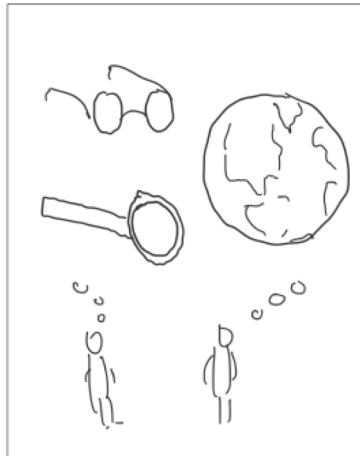
SHOW UP



SHARE RESOURCES



CO-CREATE VISIONS



PERSPECTIVE TAKING

Sketchnotes: A Communication Tool to Strengthen Research and Practice Links

Nicole L. Fonger

Syracuse University

nfonger@syr.edu

@nmlfonger #progressinpress
#sketchnotes #MTBoS

1

[ACTIVE PROCESS
[COLLECTIVE
RESPONSIBILITY



What does it
look like?

MAKE PRACTICES
EXPLICIT

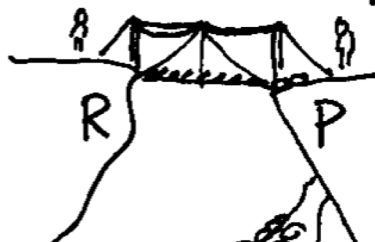
FOCUS

TRANSLATION

R → P

CURRENCY

BRIDGE BUILDING



2

CONMLFONGER

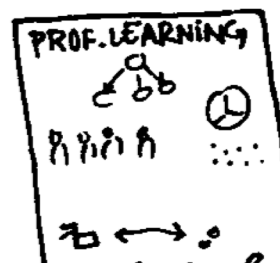
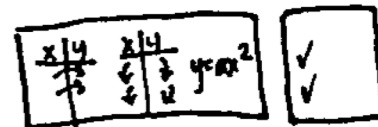
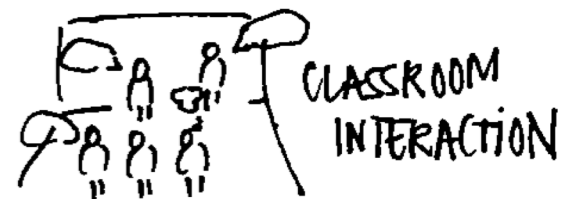
EQUITY
CURRENT
STRUCTURES
ARE NOT LIKE
fit ALL

NEW COMMUNICATION
MECHANISMS NEEDED

3

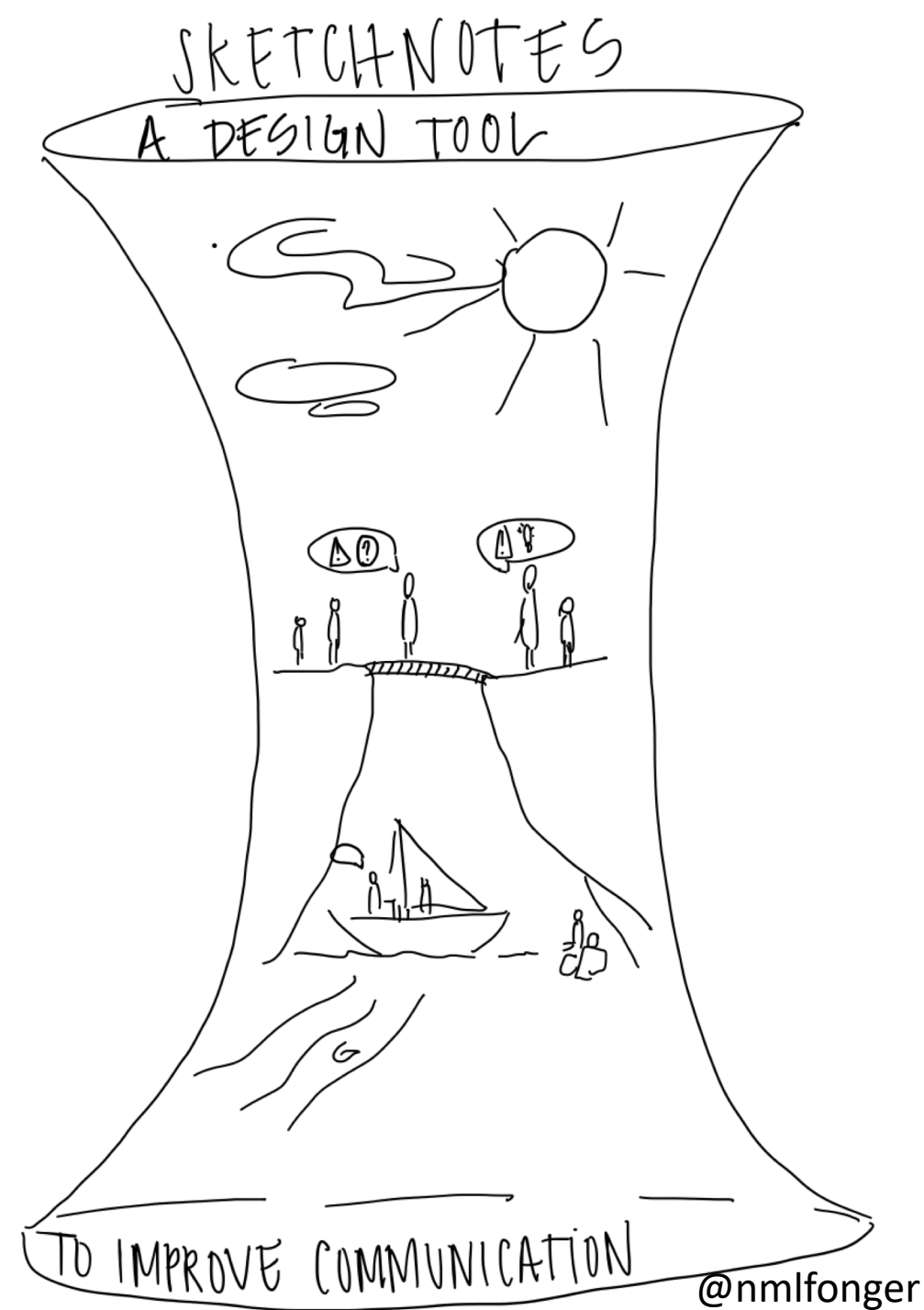
(*) SKETCH NOTES!
ARE A VIABLE TOOL

why? DUAL CODING
&
REPRESENTATIONS

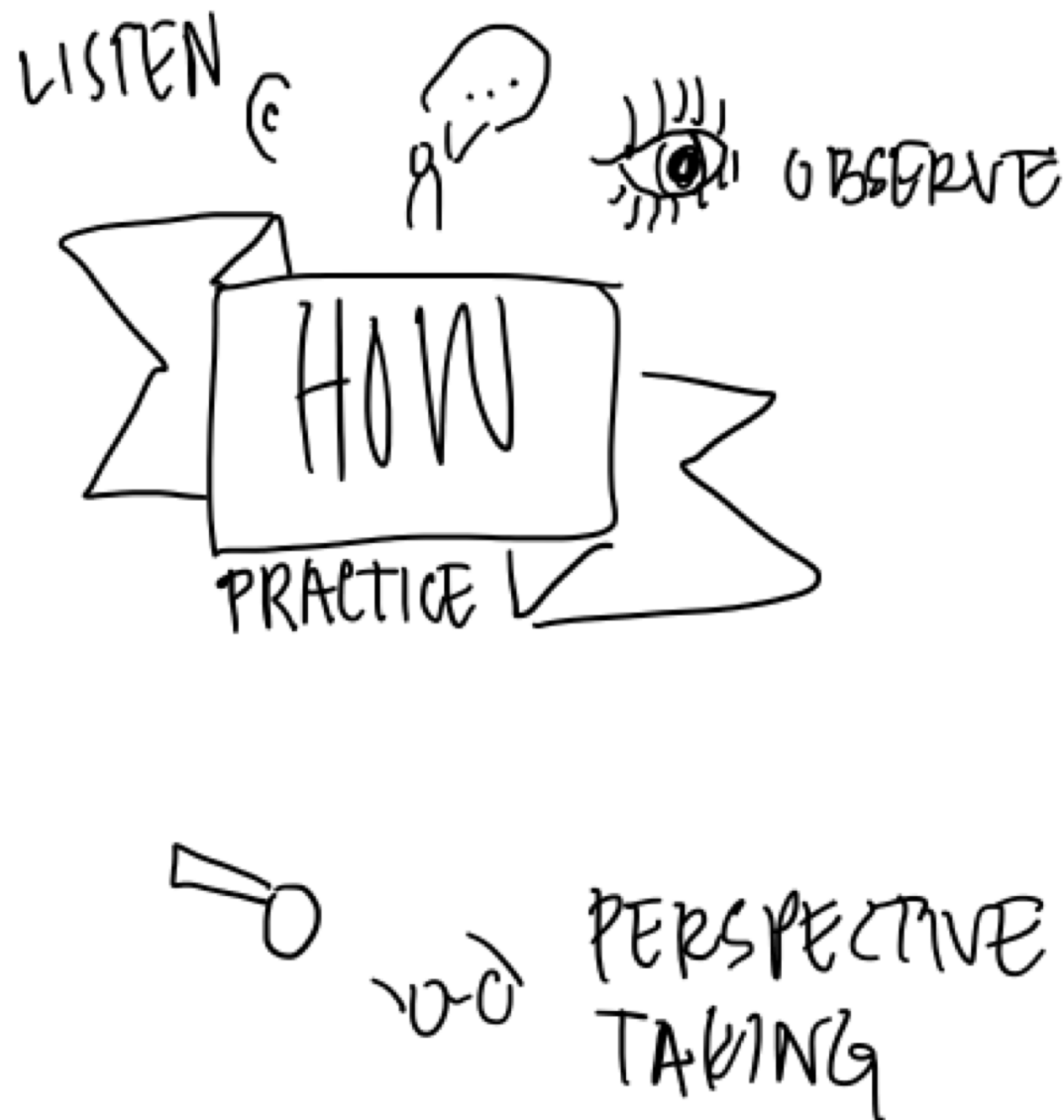
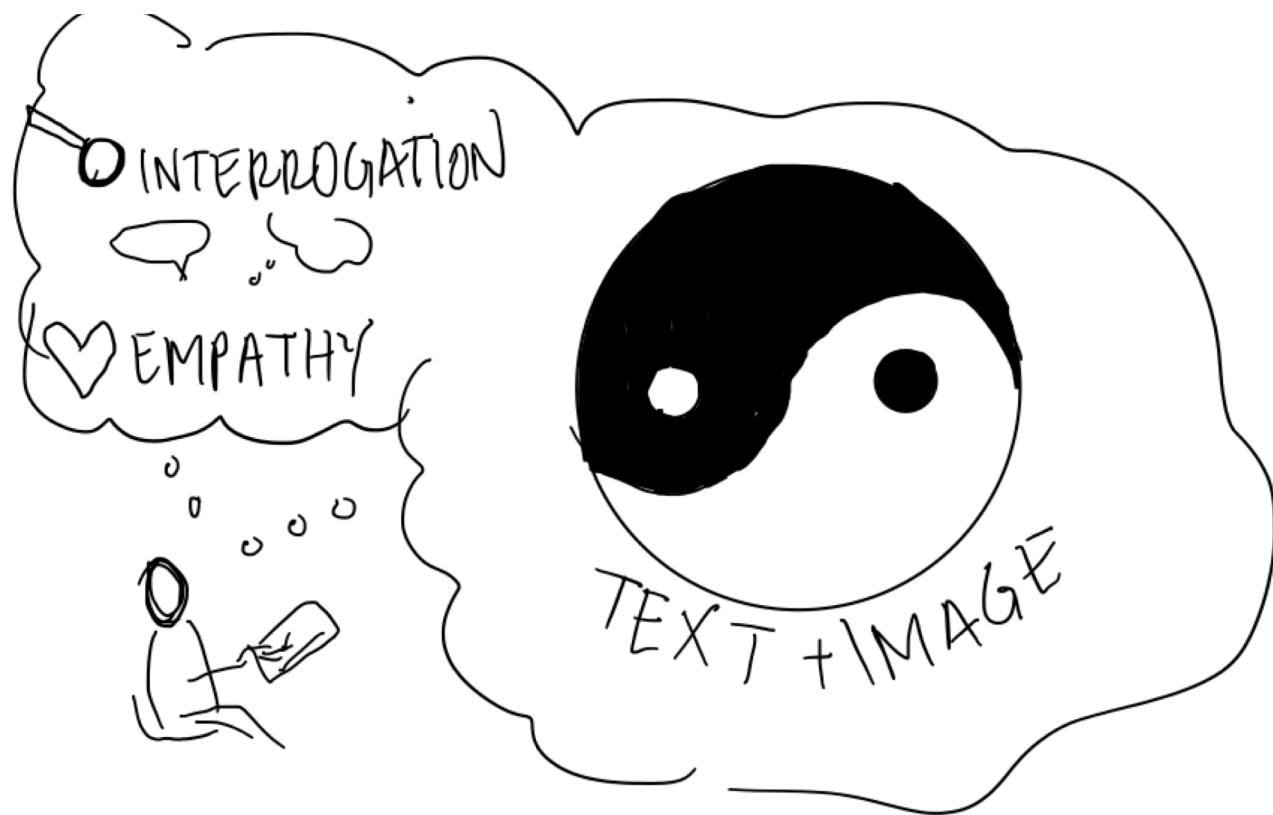


Introducing Sketchnotes

- “sketchnotes are visual maps built from meaningful thoughts and ideas” (Rhode, 2013, p. 10).
- Meaningful \leftrightarrow creating, interpreting, connecting representations (Lesh, Post, Behr, 1987; Dreyfus, 1991; Duval, 1999)

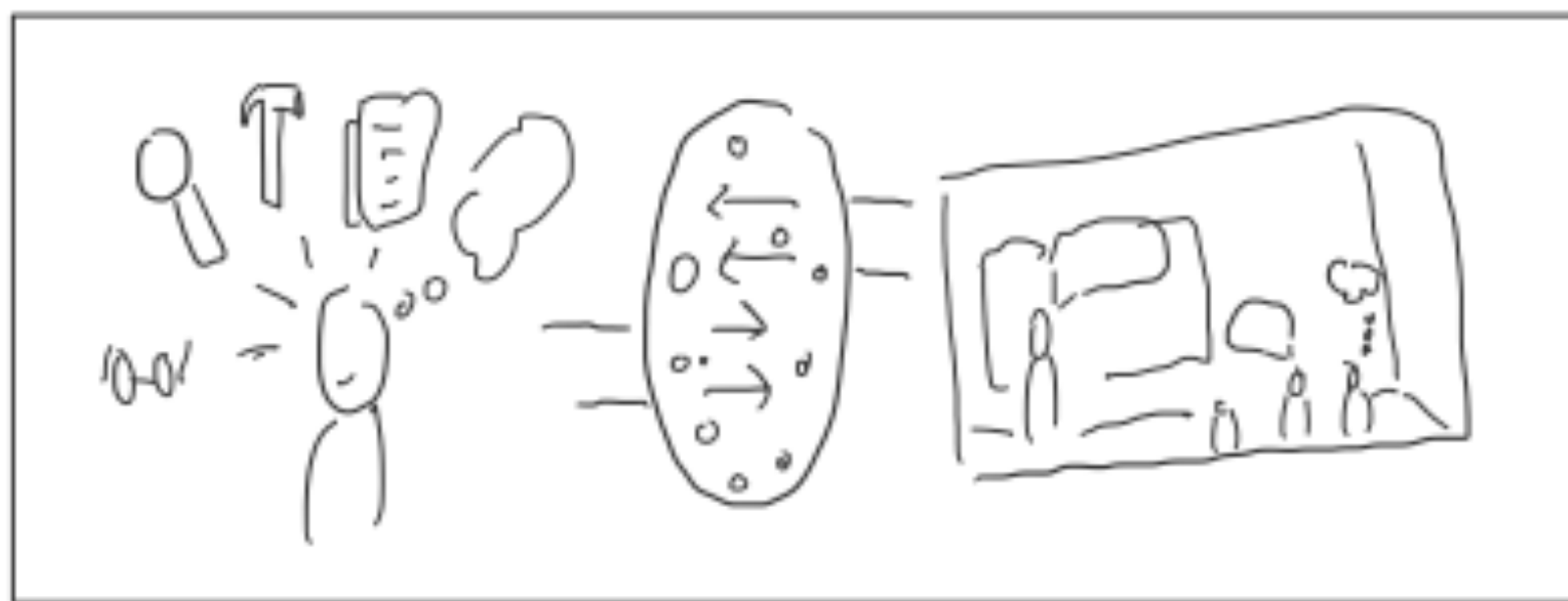


Engage: Practice Sketching!



@nmlfonger

Audio recording of reading the following blog on Translating theories
<https://bold.expert/how-can-educational-research-translate-to-the-classroom/>



FILTER

RESEARCH & PRACTICE

KNOWLEDGE, TOOLS, EXPERIENCES

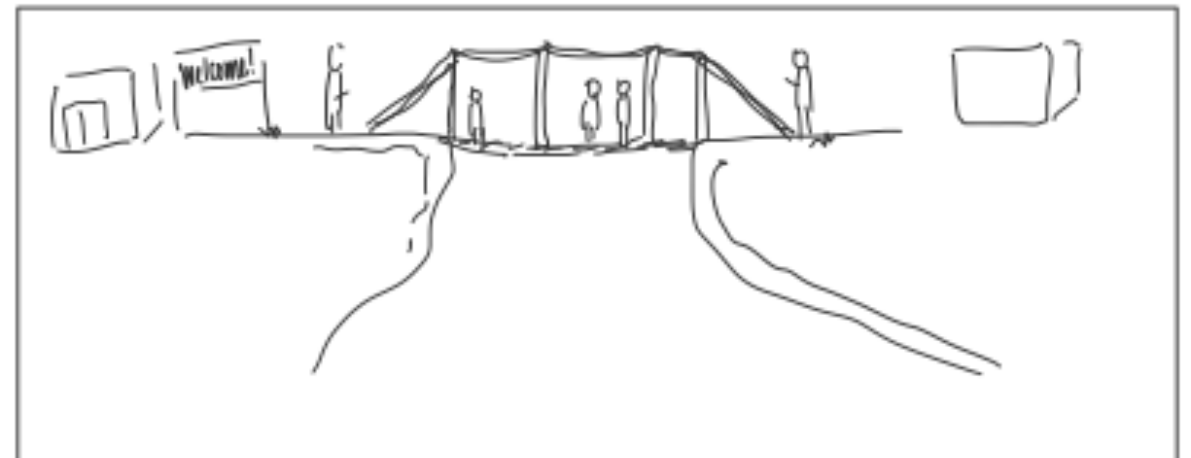
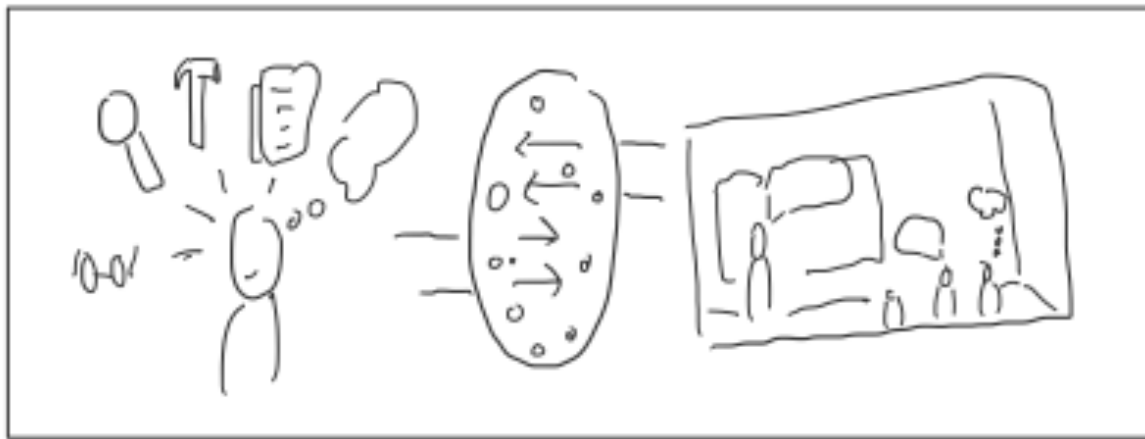
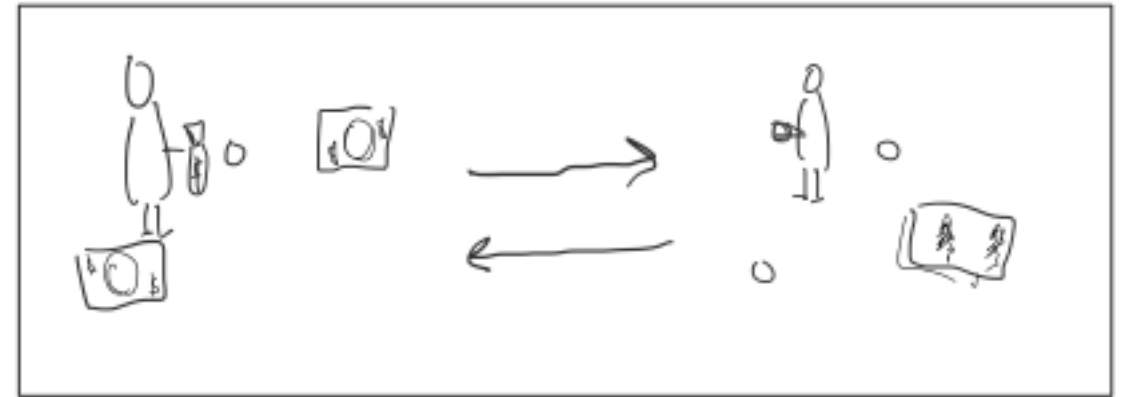
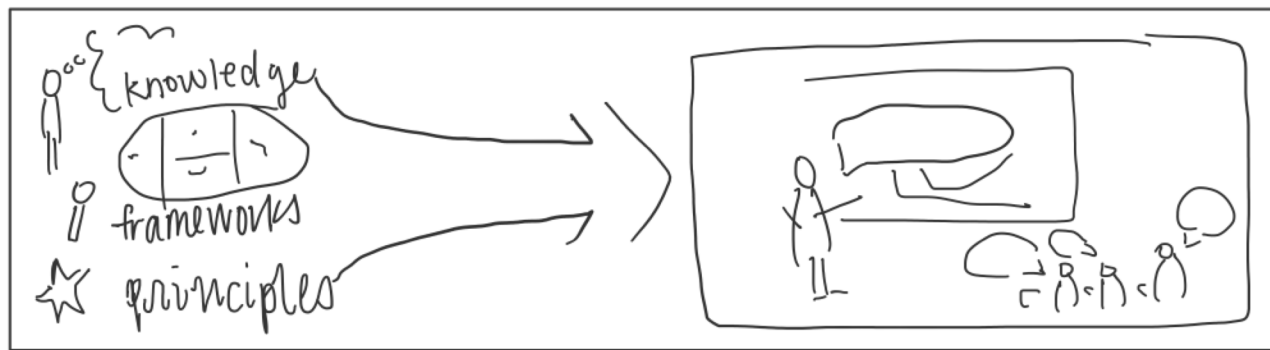
1. Linking research and practice is an active process; a collective professional responsibility; an imperative for the advancement of the field.

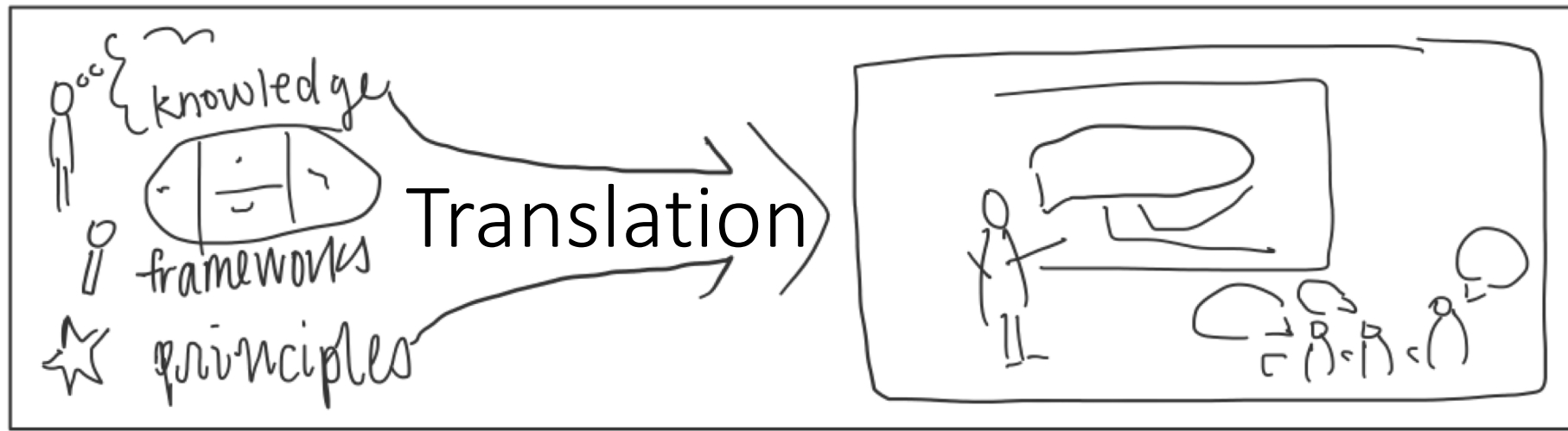
Arbaugh et al (2010); Boerst et al., (2010); Heid et al. (2006); Herbel-Eisenmann, et al. (2016).

Kieran et al.. (2012); Langrall (2014); Silver (2003); Silver & Lunsford (2017).

Cai et al. (2017a, 2017b, 2017c, 2017d, 2018a, 2018b, 2019)

Metaphors for Linking Research and Practice





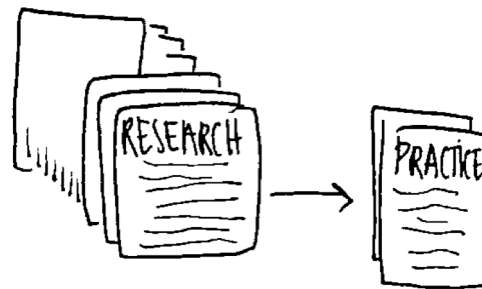
“change of language may be needed to enhance communication”


(Silver & Lunsford, 2017, p. 35)

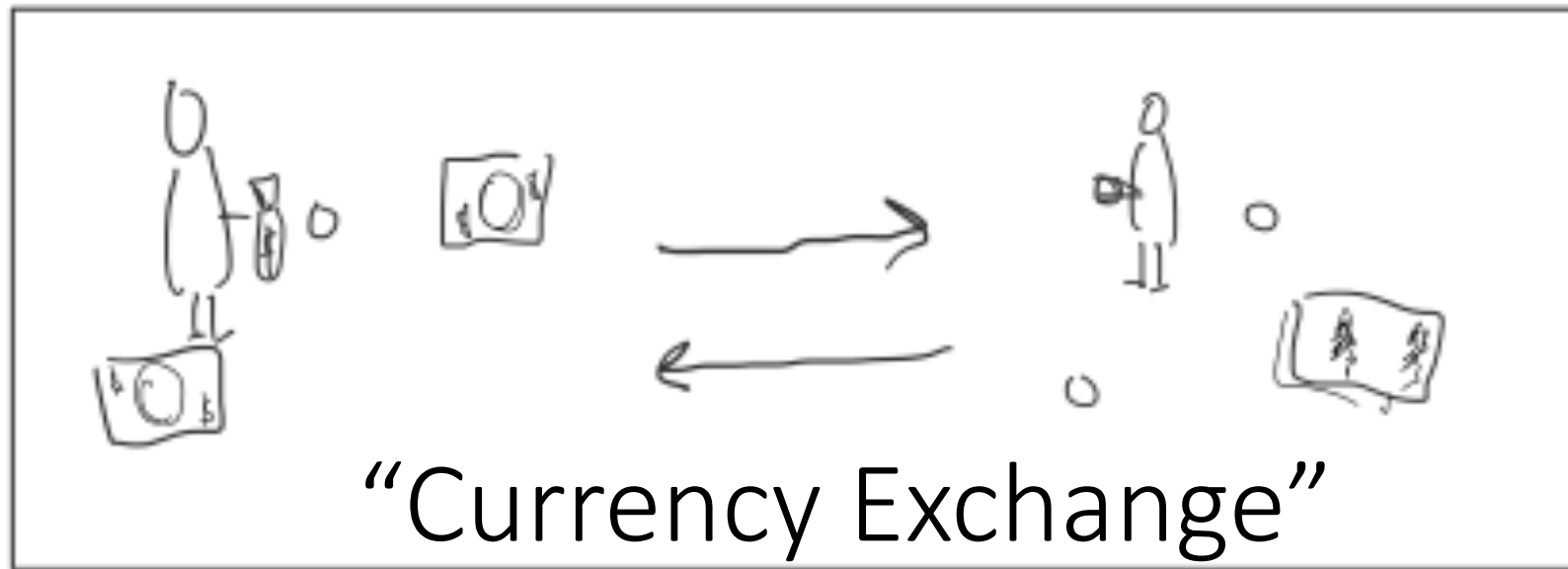
Clips/briefs not useful for classroom challenges (Burkhardt & Schoenfeld, 2003)



Dominant: Text only



Access:  MEMBERS ONLY



(Silver, 2003)

Researchers' Currencies:

- ✓ Theories
- ✓ Methods

Teachers' Currencies:

- ✓ Experience, Insight
- ✓ Problems of Practice, Passion

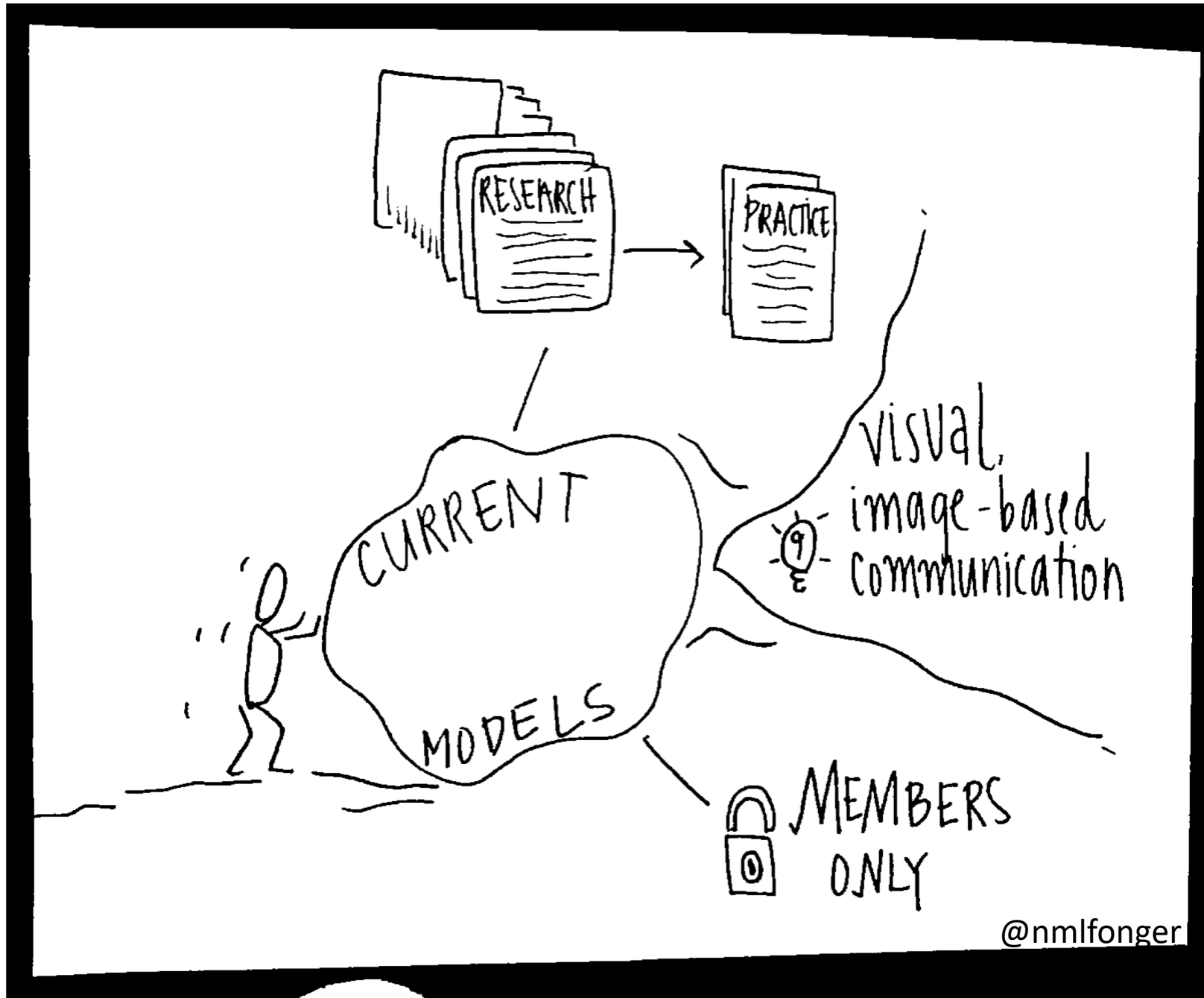


Invisible Communication Acts

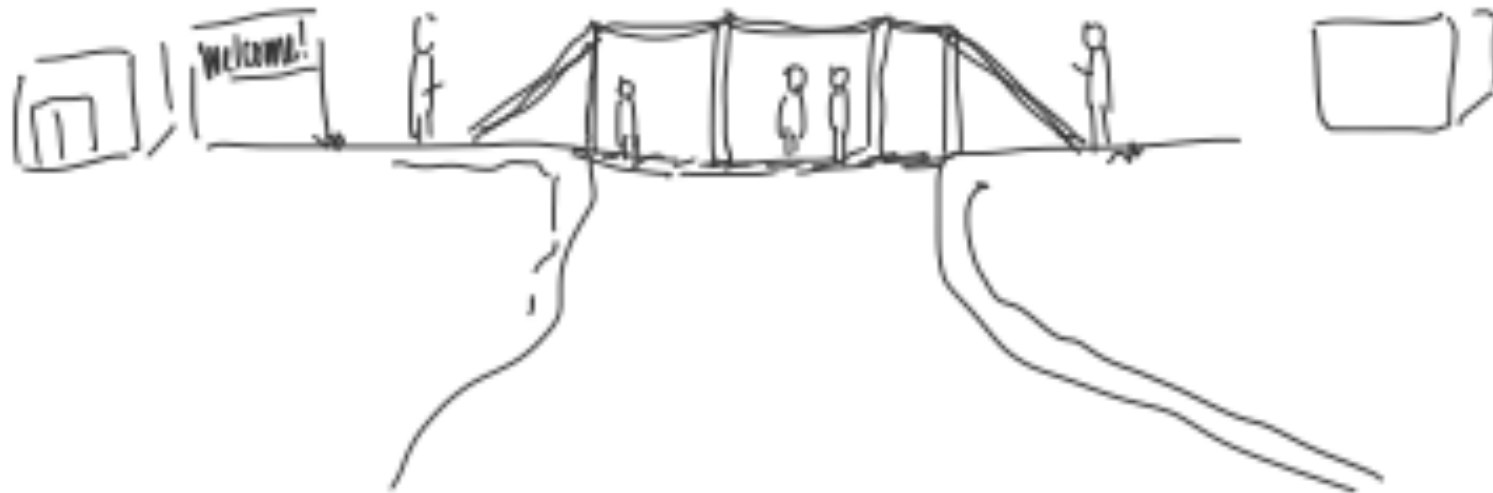


? Need for exchange


***challenge
current
structures
and
strategies for
pushing the
field forward***



2. New communication mechanisms are needed to bridge communities and improve access and visibility of ideas and practices.



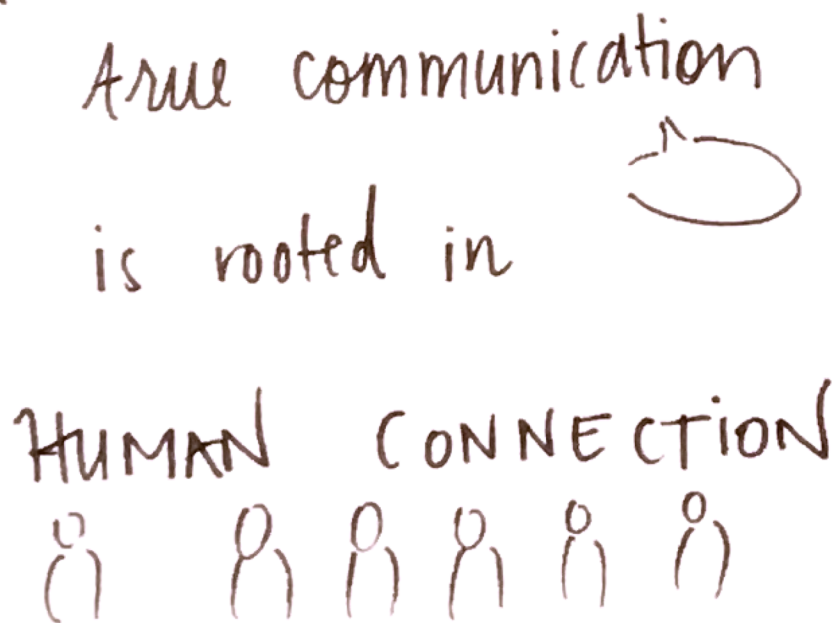
Herbel-Eisenmann et al. (2016); #sketchnotes @nmlfonger

 THE WORK
OF LINKING
RESEARCH &
PRACTICE

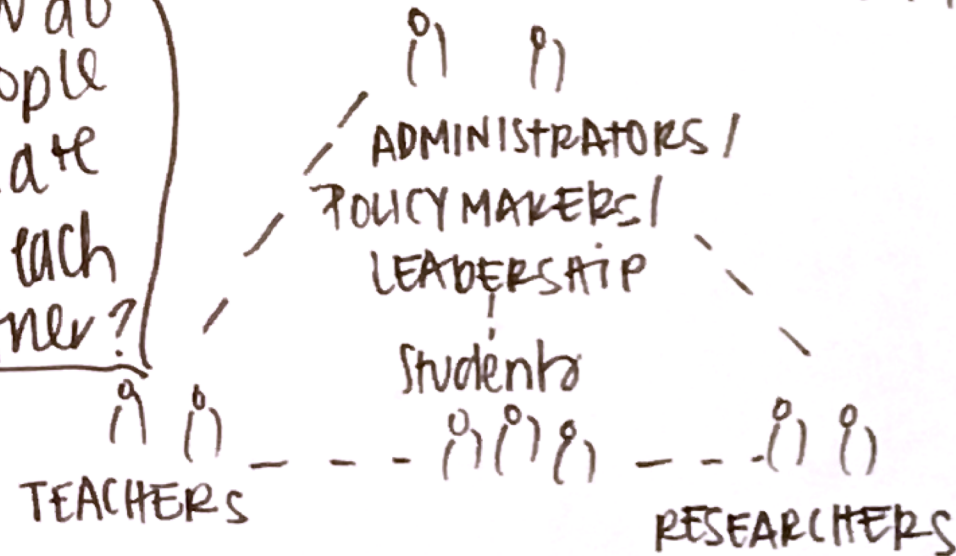
REQUIRES EFFECTIVE
COMMUNICATION

AMONG & ACROSS STAKEHOLDER
COMMUNITIES

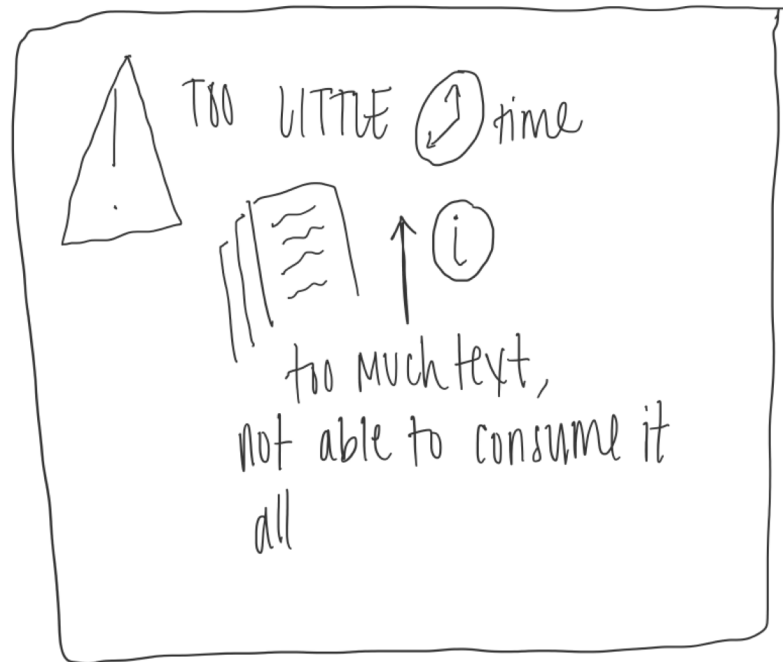
True communication
is rooted in
HUMAN CONNECTION



How do
people
relate
to each
other?

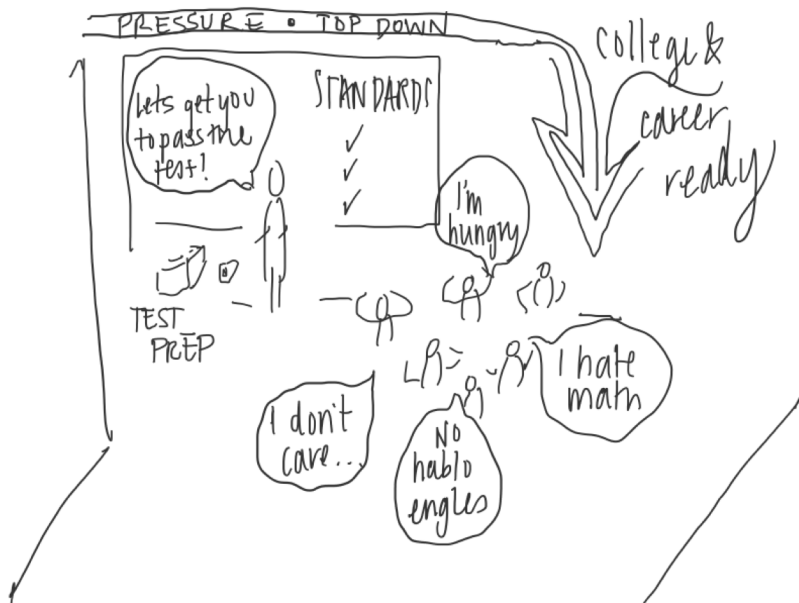


multiple mediums of communication are necessary for effective dissemination of information, especially across stakeholder groups (Hutchinson & Huberman, 1993).



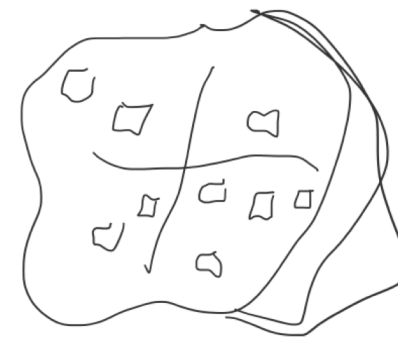
will
this work?

We don't
have the
capacity to
add a new
project



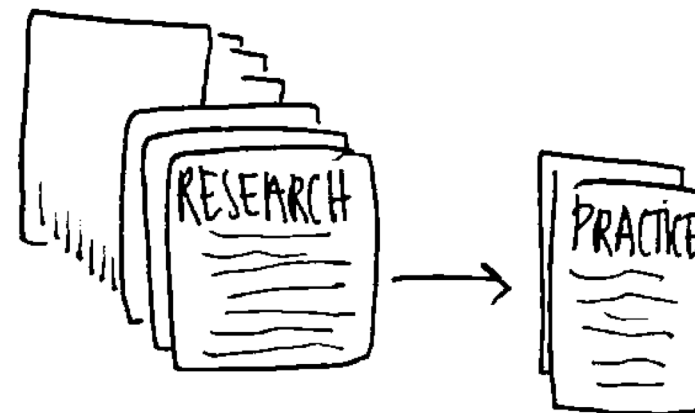
IS RESEARCH
REALLY RELEVANT
TO MY CONTEXT?

OUR DISTRICT





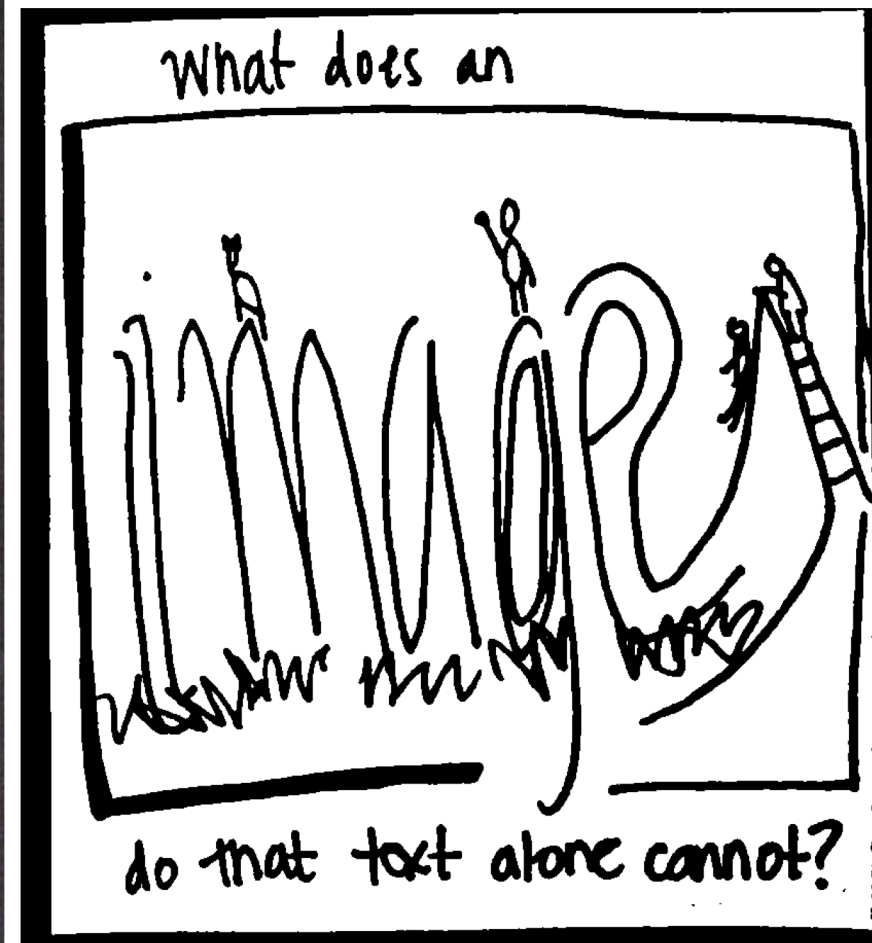
Not a 1-size fits all model



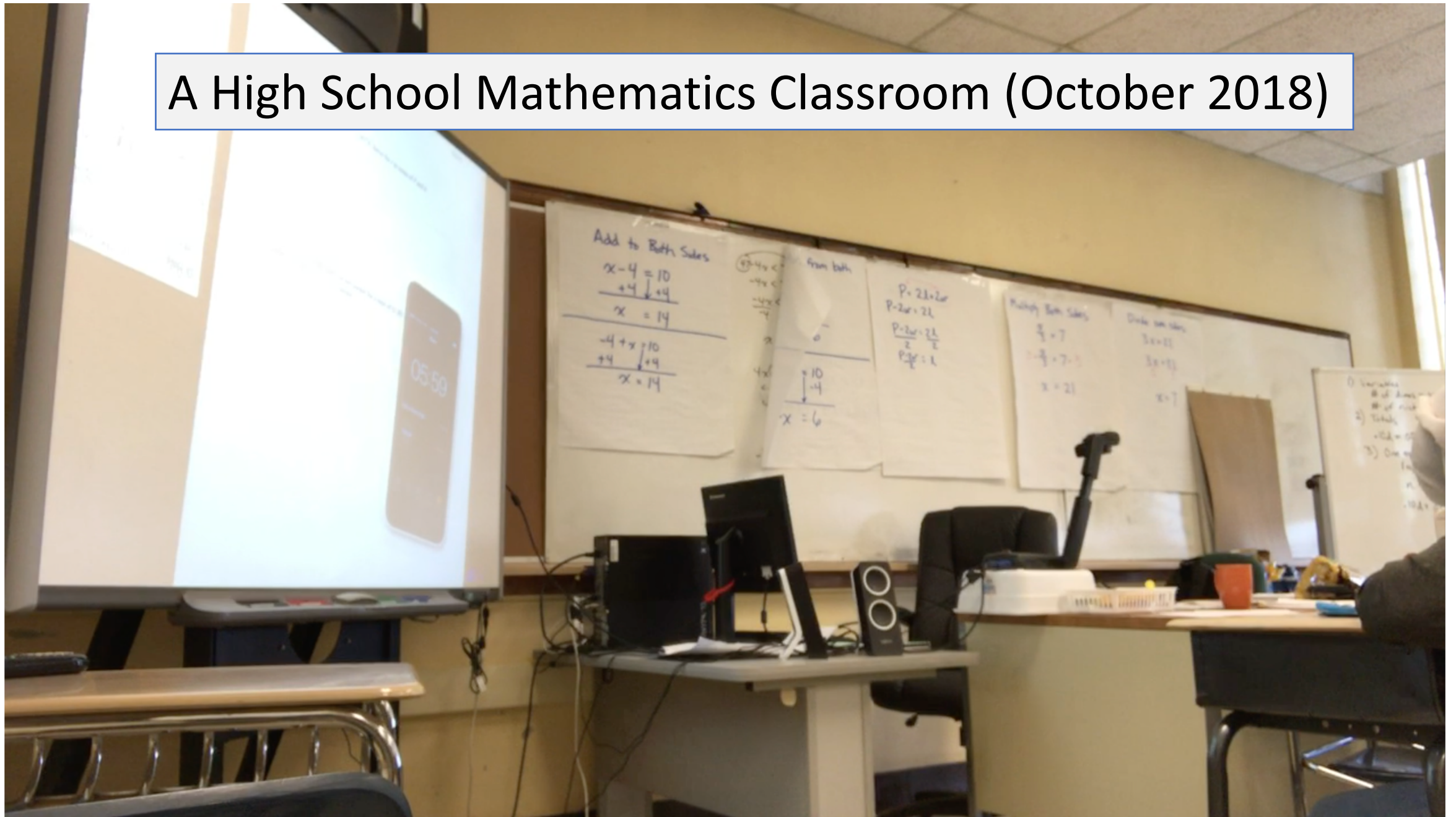
Equity is not about giving everyone the exact same thing, it's about hearing someone's voice about what they need, and providing them with that (Emdin, 2012).



We don't always need words...



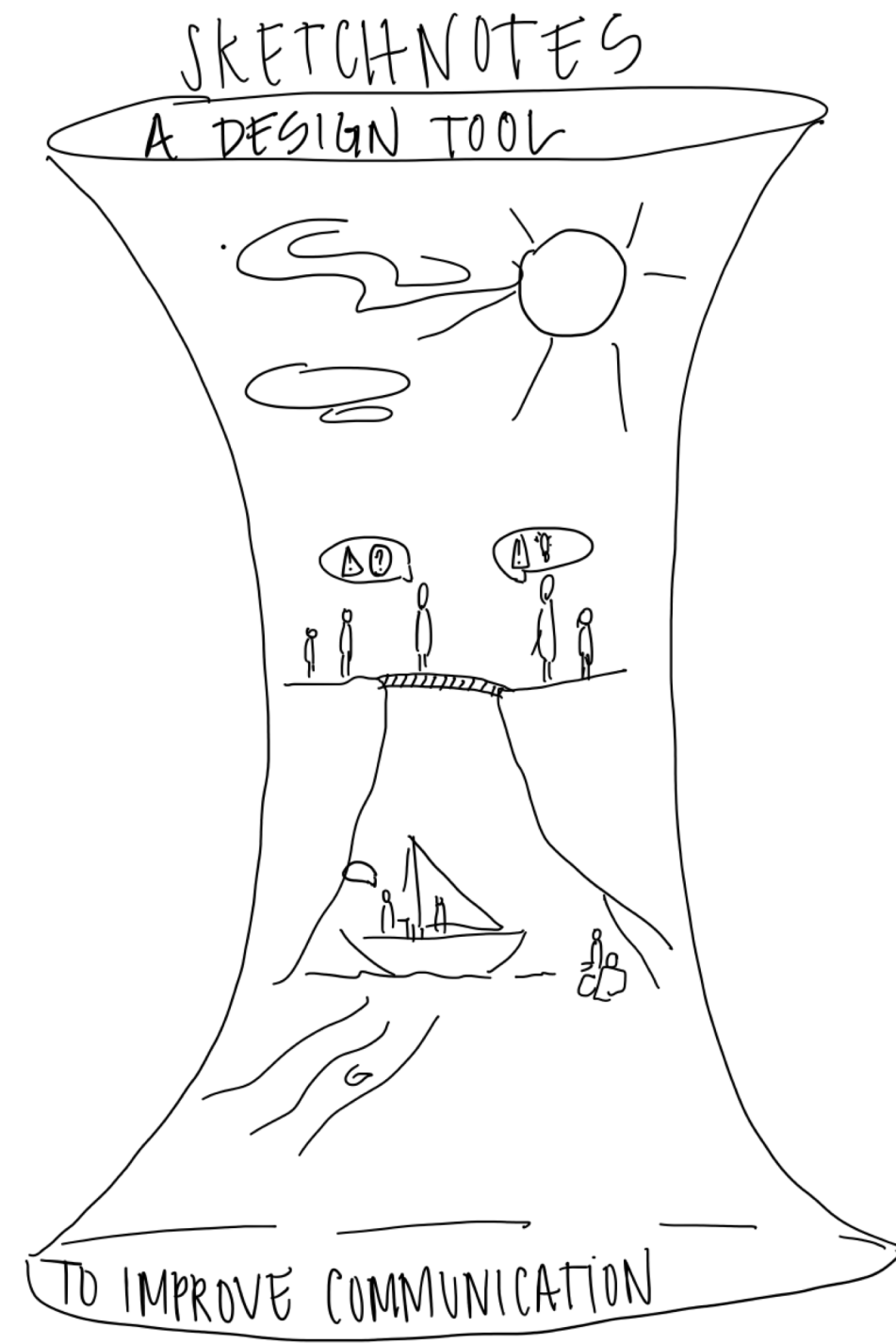
A High School Mathematics Classroom (October 2018)





The Same High School Mathematics Classroom (March 2018)

3. Sketchnotes have potential to improve engagement in meaningful communication acts among mathematics education stakeholders, effectively strengthening links between research and practice. @nmlfonger

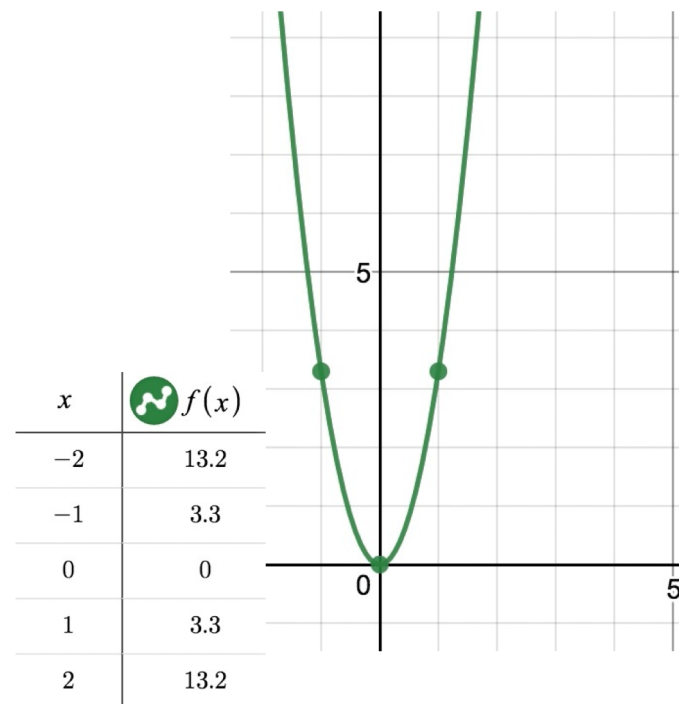
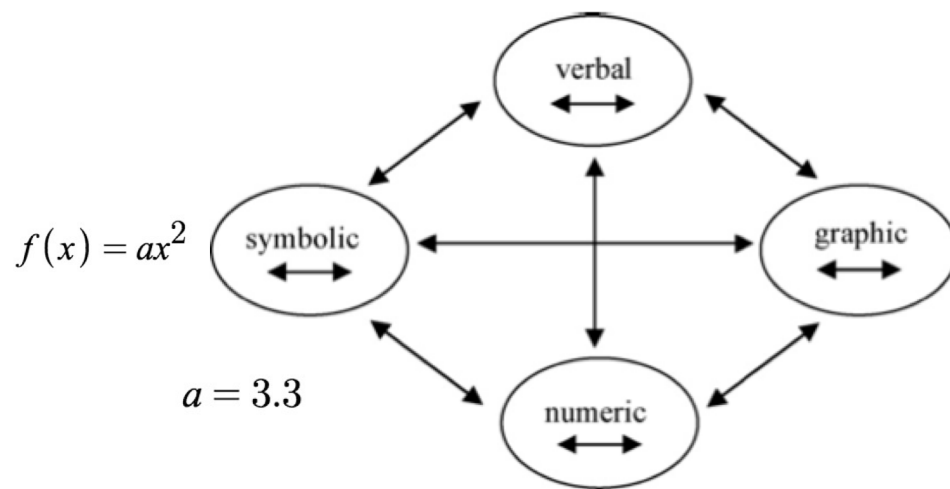


Conceptual Framework

Why Sketchnotes?

Theories of Communication in Support of Sketchnotes

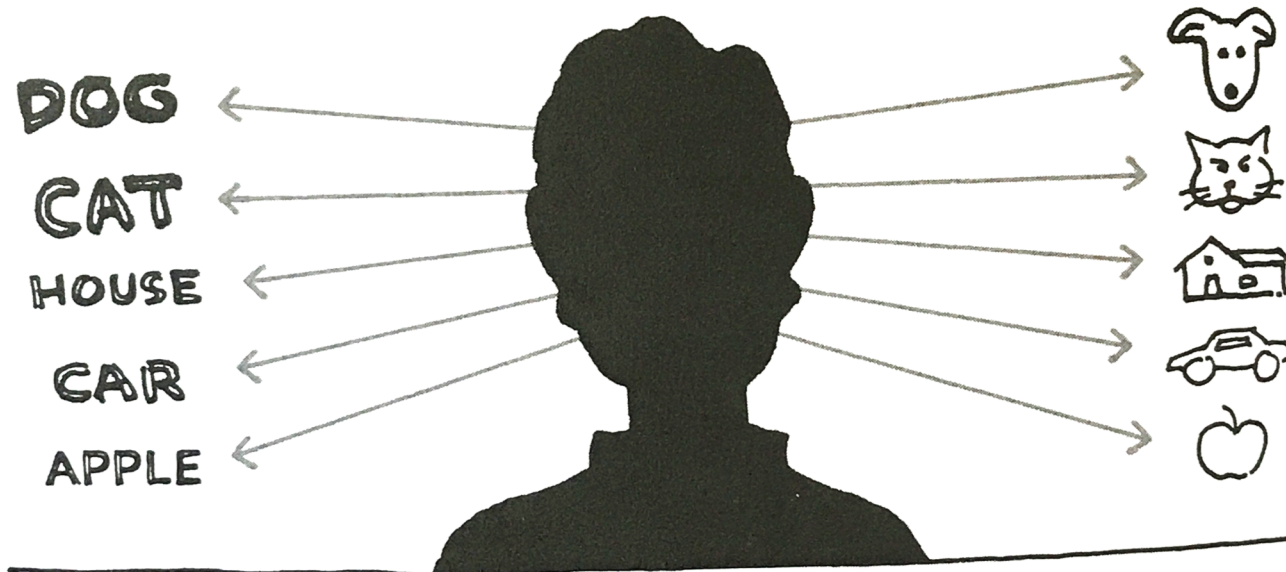
- All communication occurs through representations (Herbst, Bieda, Chazan, Gonzalez, n.d.)
- Multiple representations provide opportunities to extend meaning-making and understanding (Boaler, 2016; Duval, 1999; Dreyfus, 1991; Fonger, 2019; Huntley et al., 2007; Lesh, Post. & Behr, 1987; Lobato, 2012; NCTM, 2000, 2014; Selling, 2015)



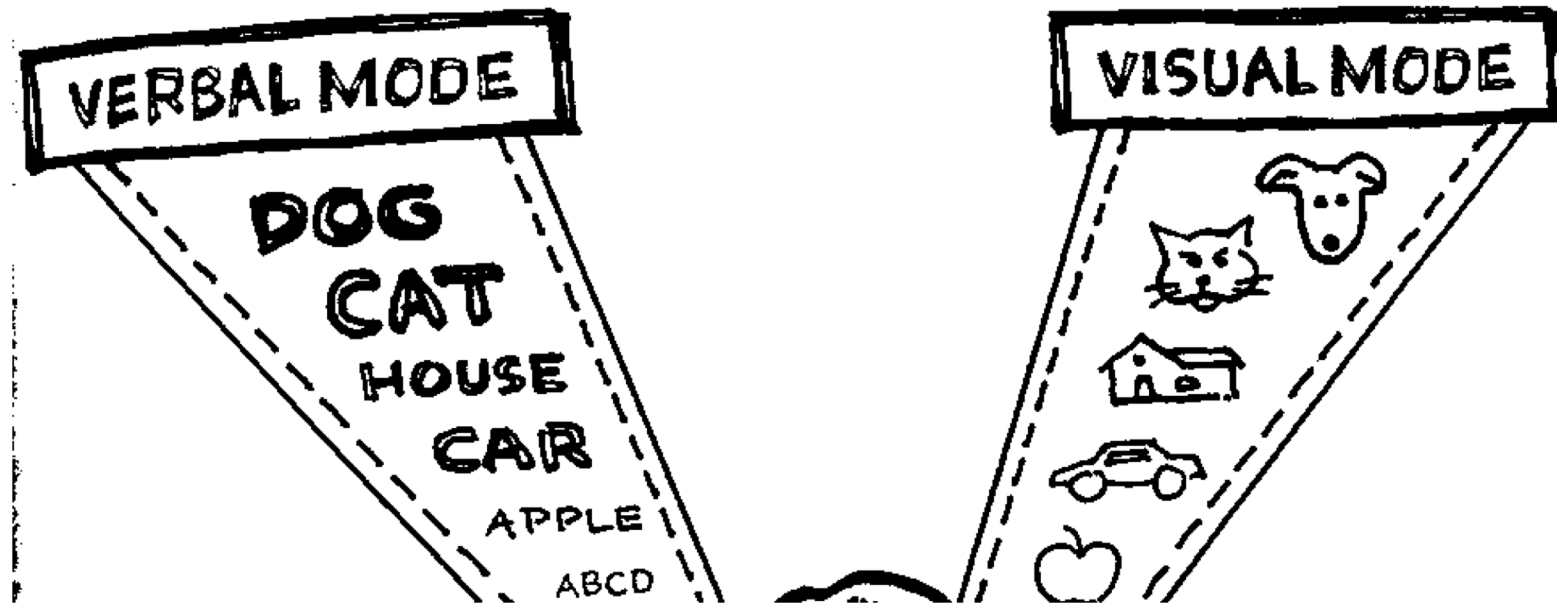
THE DUAL CODING THEORY,
proposed in the 1970s by Allan Paivio,
suggests that the brain processes information
using two primary channels: verbal and visual.

★ **VERBAL** ★
Concepts as words

★ **VISUAL** ★
Concepts as images



SKETCHNOTING Engages → YOUR WHOLE MIND ←



- Dual Coding Theory: verbal and visual processing (Clark & Paivio, 1986)
- Picture superiority effect: images > words alone (Hockley, 2008)
- Sketchnotes help create meaningful connections (Rohde, 2013)

The use of sketchnotes as a communication act is rooted in the assumption that learners need both text and visual to effectively communicate, learn, and recall information @nmlfonger



HEAR



SEE



THINK



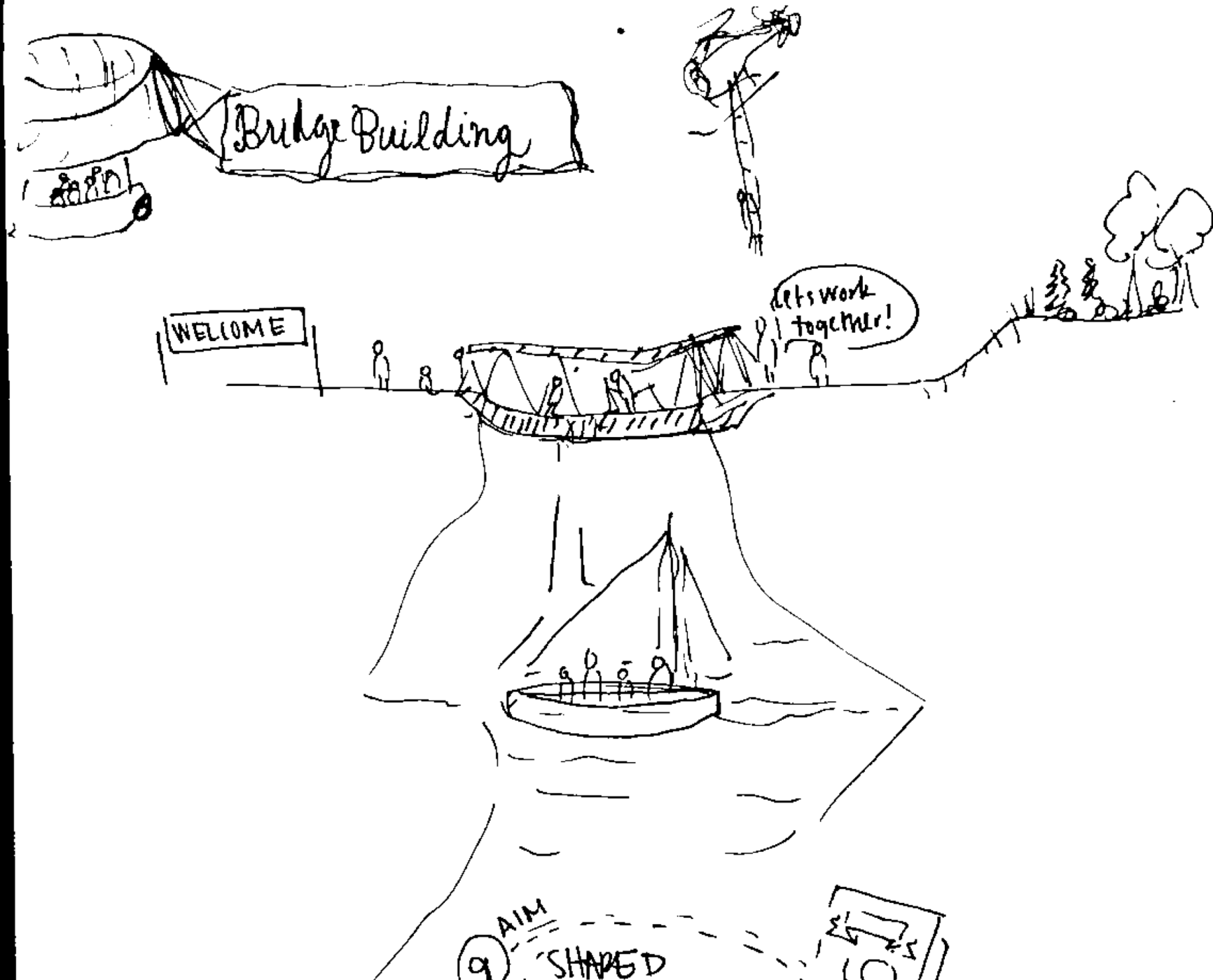
DRAW

Images from Rohde (2013, p. 28)

What Might This Look Like?

Examples of Sketchnotes Across Phases of Linking Research and Practice

Conceptualizing problem spaces, building
shared agendas, moving toward action



Activity Structures, Collaborative

teaching experiment (Fonger, in preparation)

Teacher led
Lesson

CLASSWORK: COPY T's work
Exit ticket:

complete
correct
Method/
procedure/
answer
that
will be
scored
high
on
regents
+
uses teacher's
method

WHAT "COUNTS" AS MEANINGFUL LEARNING IN EACH MODEL?

REPRESENTATIONAL
FLUENCY

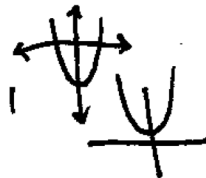
CLASSWORK:

Student
thinking
made public
as STARTING
POINT

paper
board
doc
cam

SUSTAINED attn
to elicit + build
on student led ideas

informal \rightarrow formal



the ADS is
 $x=0$

the "y-zeros"
are the same \rightarrow the vertex
is $(0, y)$
in each

TECHNOLOGY

CLASSWORK:

Predictions may be
INCORRECT
Thought goes into
what we EXPECT
of technology
Student catches own
Differences + fixes
prediction
Student describes the
change in words
(writing or orally)

Exit Ticket:

I predict zeros @ $x=1, x=2$

My calc. screen



they match / don't match

this makes / fixed

3 ACT

CLASSWORK:

Notice
wonder
asking
questions
sustained
curiosity

Testing out
own ideas

Student led
inquiry +
methods

Student led
solution

Exit Ticket:

Apply Model in
New context



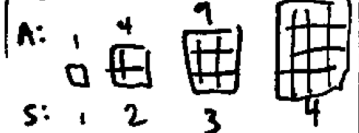
ACTIVE PROBLEM
CLASSWORK:
SOLVING

CLASSWORK:

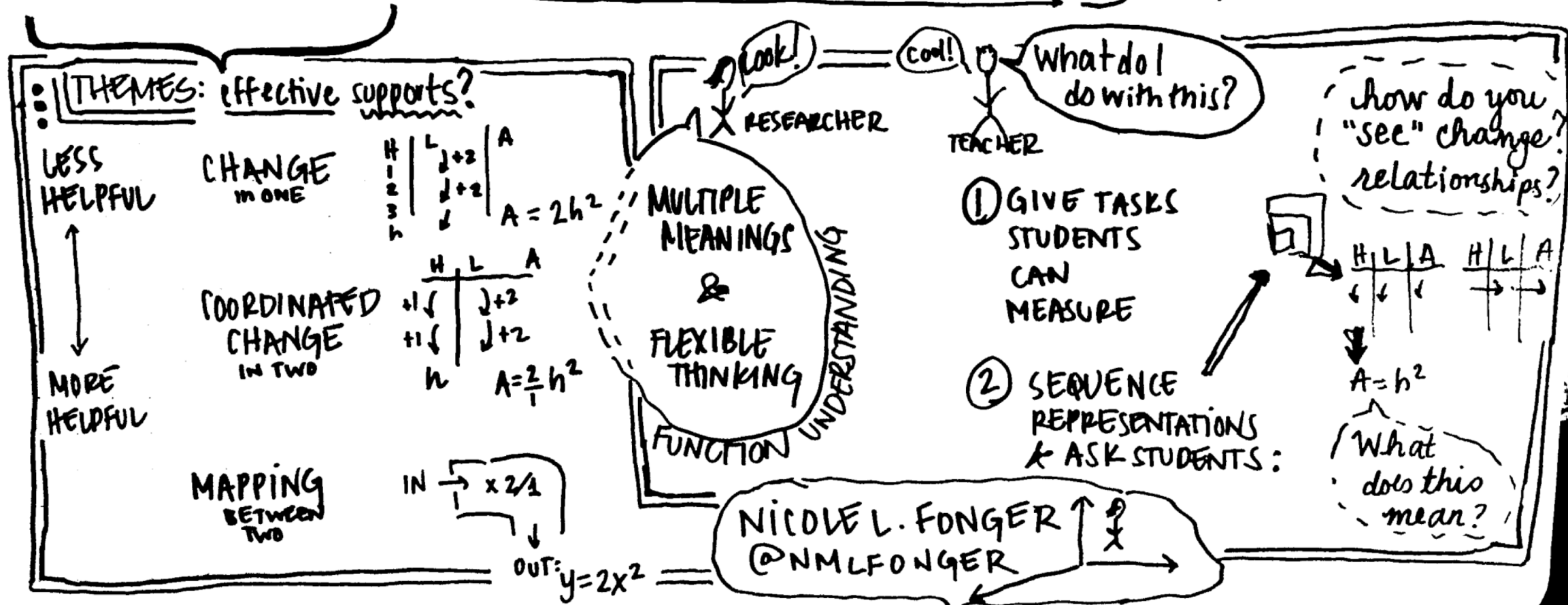
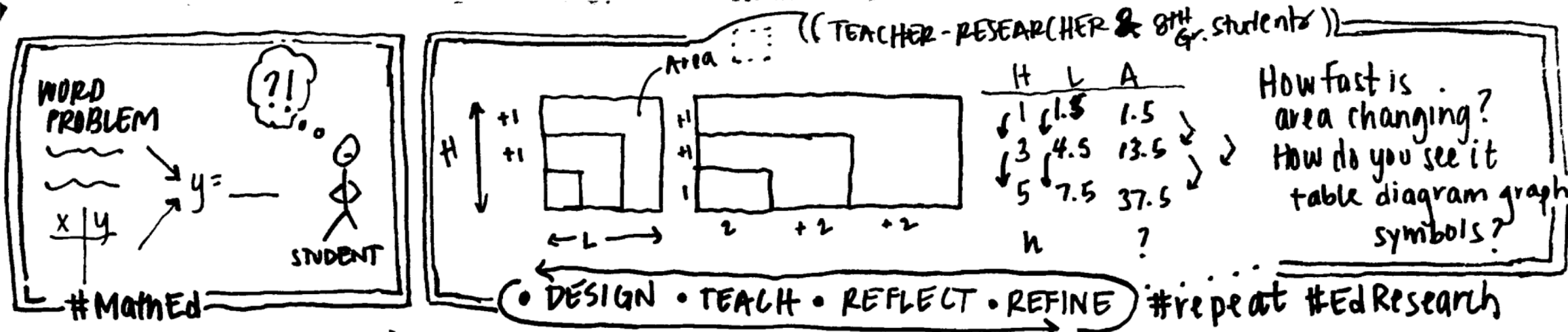
experiment +
play with
manipulatives
+ Models
(hands on)
generate
patterns
and
generalize

Explain thinking
Build on other
s' ideas

Exit Ticket:



this is quadratic

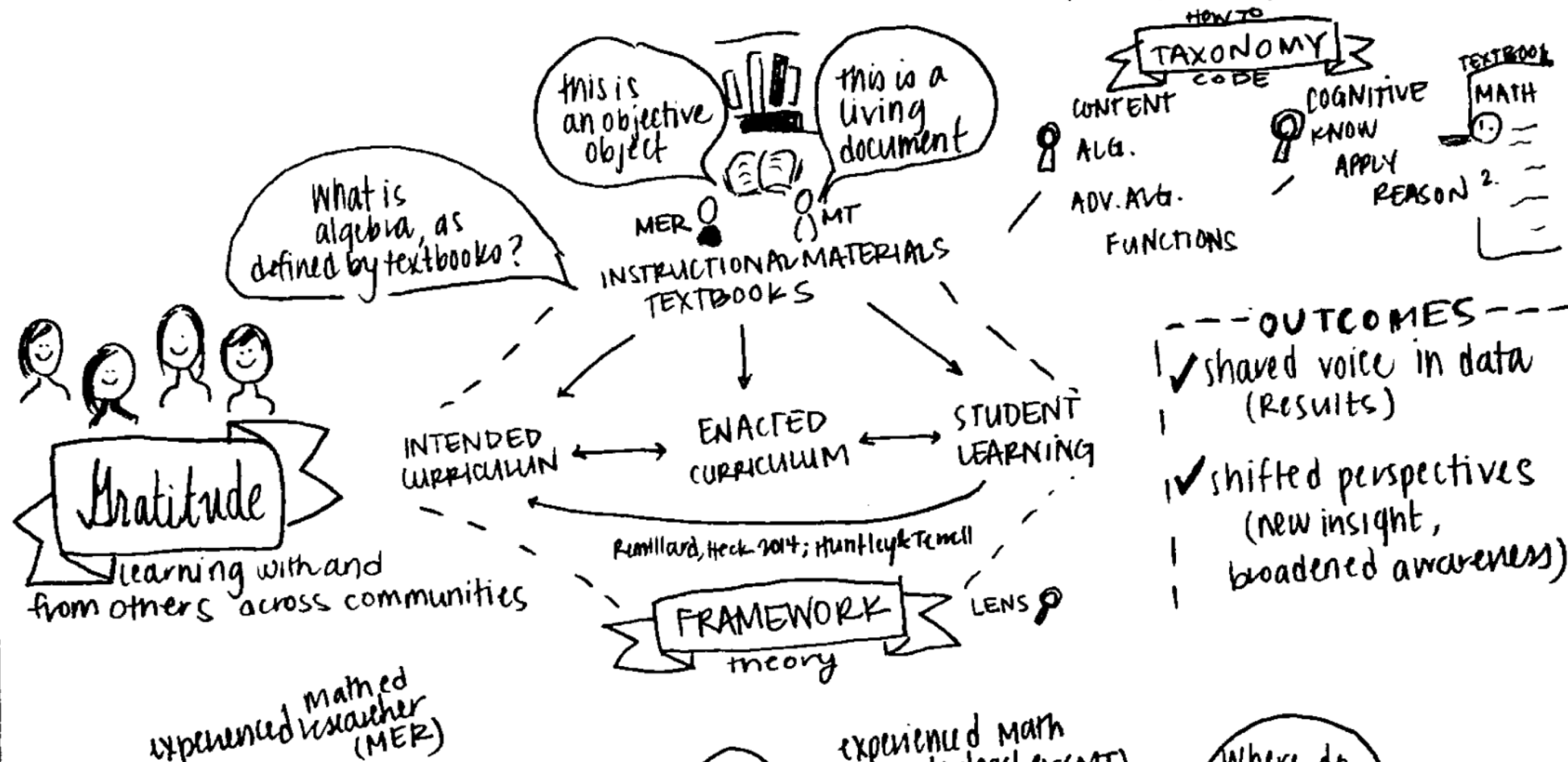


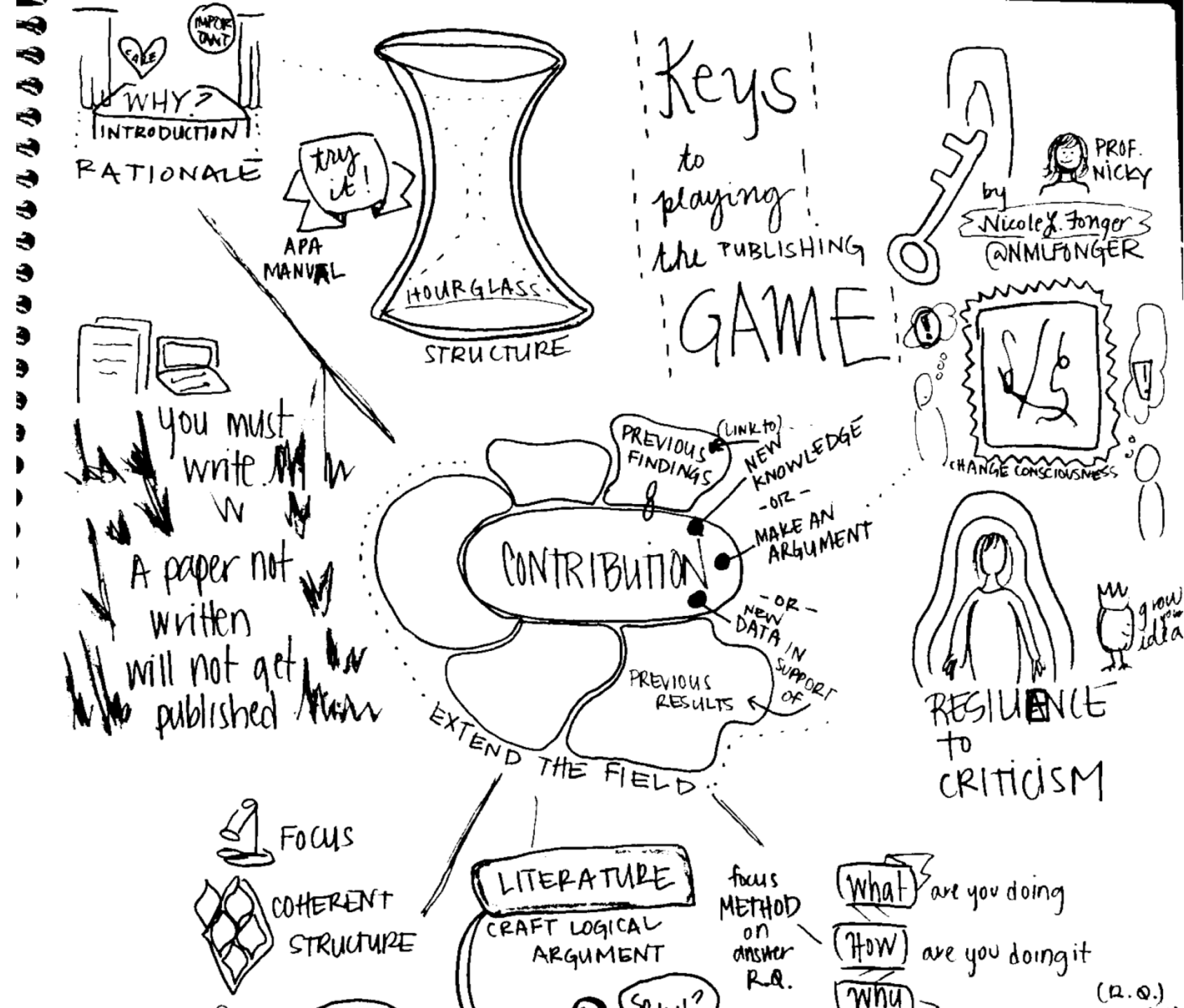
Mayer, J., Huntley, M. A., Terrell, M., & Fonger, N. L. (2019). Professional learning through a teacher-researcher collaboration: I never felt like "just a teacher". *Mathematics Teacher*.

Professional Learning through

.....TEACHER-RESEARCHER.....

C O L L A B O R A T I O N S





Concluding Remarks

WHY YOU ^{should} CARE

INTRODUCTION

Access to RESEARCH is AN ISSUE OF EQUITY

Come one, Come all!

「visibility of PRACTICES」

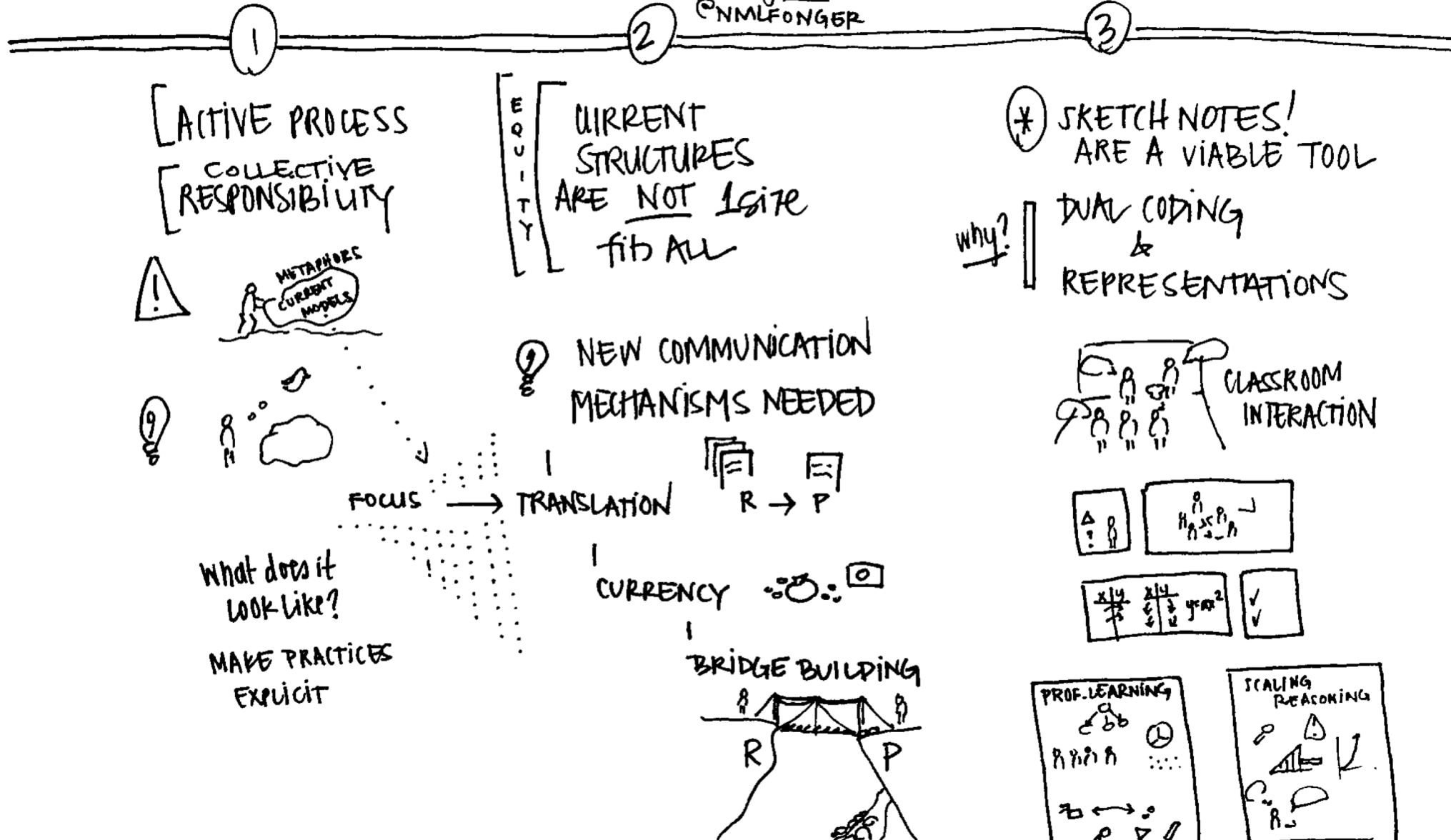
GRAND CHALLENGE

How can I help from over here? Working alone?

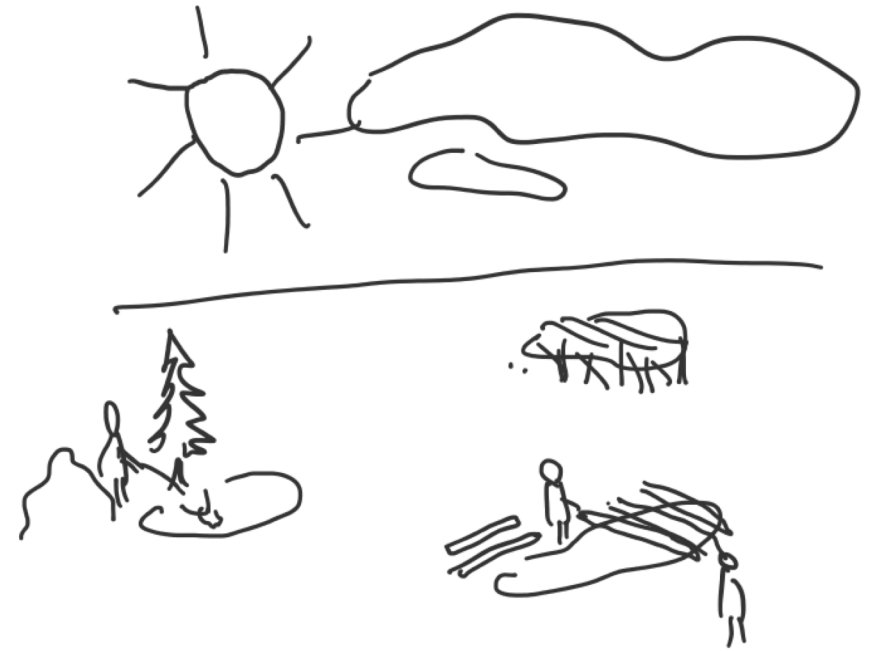
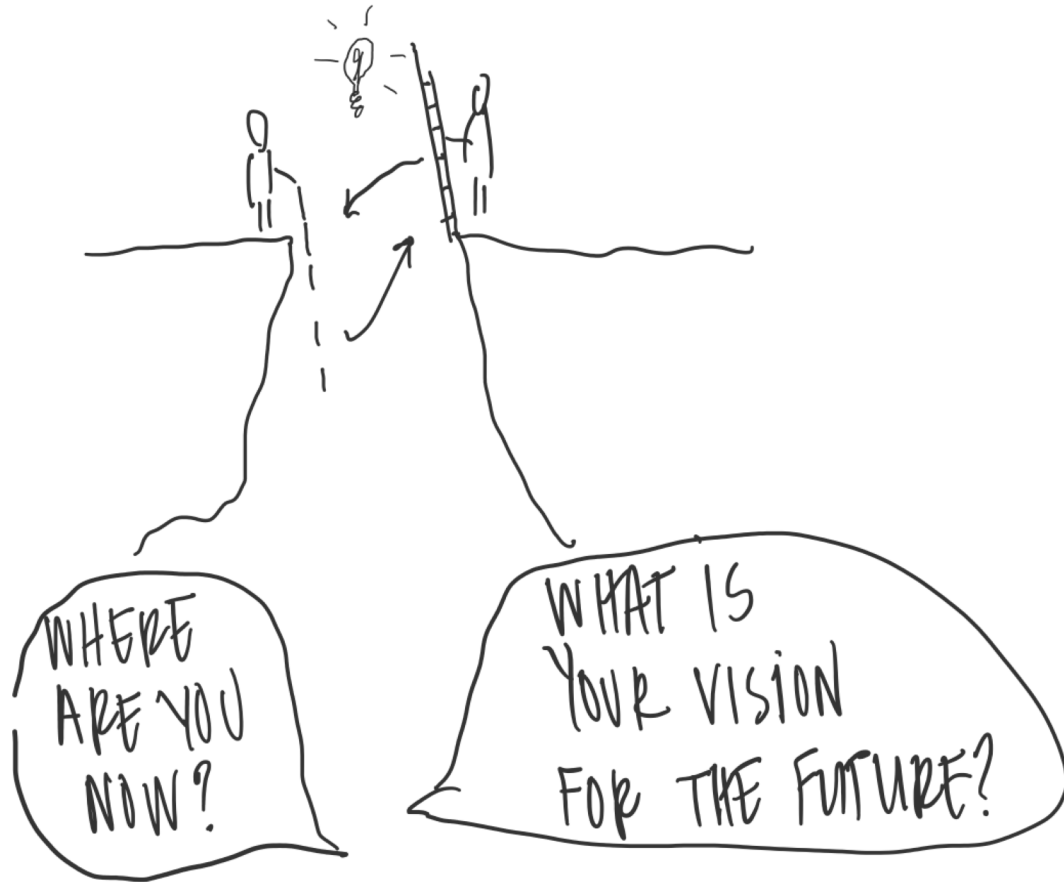


SKETCHNOTES AS A COMMUNICATION TOOL TO STRENGTHEN RESEARCH & PRACTICE LINKS

{Nicole L. Fonger}
©NMLFONGER



*How might sketchnotes
promote equitable access to
ideas, tools, and resources?*



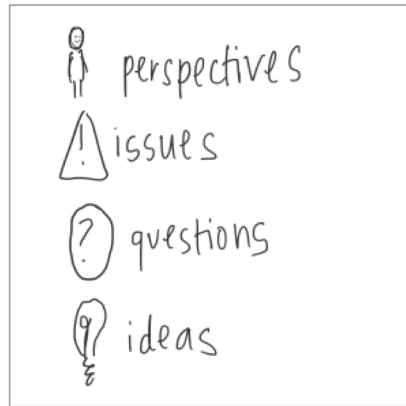
HOW CAN WE
SUPPORT EACH OTHER
WITH TOOLS, RESOURCES,
& SHARED WORK?

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ESSENTIALS of EFFECTIVE COMMUNICATION



SEEK TO UNDERSTAND



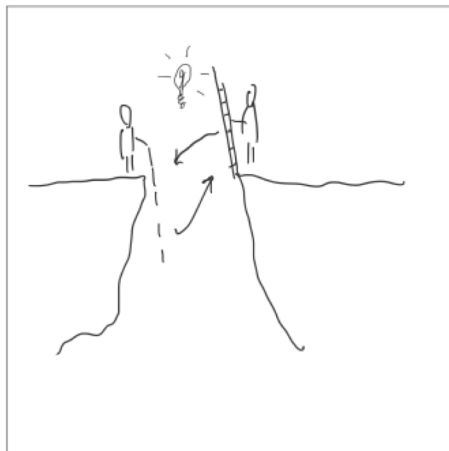
FOCUS



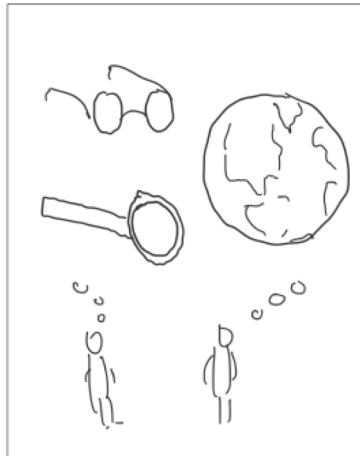
SHOW UP



SHARE RESOURCES



CO-CREATE VISIONS



PERSPECTIVE TAKING

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@nmlfonger #progressinpress
#sketchnotes #MTBoS

Select References

- Arbaugh, F., Herbel-Eisenmann, B., Ramierez, N., Knuth, E., Kranendonk, H., & Quander, J. R. (2010). *Linking research and practice: The NCTM research agenda conference report*.
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- Fonger, N. L., Ellis, A., & Dogan, M. F. (2016). Students' conceptions supporting their symbolizations and meanings of function rules. In M. B. Wood, E. E. Turner, M. Civil, & J. A. Eli (Eds.), *Proceedings of the 38th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Tucson, AZ: The University of Arizona.
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- Mayer, J., Huntley, M. A., Terrell, M., & Fonger, N. L. (in press). Professional learning through a teacher-researcher collaboration: I never felt like “just a teacher”. *Mathematics Teacher*.
- Thanheiser, E., Ellis, A., & Herbel-Eisenmann, B. (2012). From dissertation to publication in *JRME*. *Journal for Research in Mathematics Education*, 43(2), 144-158.