Leading a Group Discussion:

Identity, Engagement, and Authority in Mathematics

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Today's talk

- What do we know about productive group discussions in mathematics classrooms?
- What (big) problems remain?
- How might we address these problems?

What do we know about productive group discussions?

Examples of Mathematics Instructional Tasks

Lower-Level Demands	Higher-Level Demands
Memorization What is the rule for multiplying fractions? *Expected Student Response:* *You multiply the numerator times the numerator and the denominator times the denominator* OR *You multiply the two top numbers and then the two bottom numbers.*	**Procedures with Connections** Find $\frac{1}{6}$ of $\frac{1}{2}$. Use pattern blocks. Draw your answer and explain your solution. *Expected Student Response:*  *First you take half of the whole which would be one hexagon. Then you take $\frac{1}{6}$ of the half. So I divided the hexagon into 6 pieces which would be 6 triangles. I only needed $\frac{1}{6}$ so that would be one triangle. Then I needed to figure out what part of the 2 hexagons one triangle was and it was 1 out of 12. So $\frac{1}{6}$ of $\frac{1}{2}$ is $\frac{1}{12}$.* Stein, M.K., Smith, M.S., Henningsen, M.A., & Silver, E.A. (2000). *Implementing standards-based mathematics instruction: A casebook for professional development* (pp. 65-80). New York, NY: Teachers College Press.
Procedures without Connections Multiply: $\frac{2}{3} \times \frac{3}{4}$ $\frac{5}{6} \times \frac{7}{8}$ $\frac{4}{9} \times \frac{3}{5}$	**Doing Mathematics** Create a real-world situation for the following problem: $\frac{2}{3} \times \frac{3}{4}$ Solve the problem you have created without using the rule and explain your solution. *One Possible Student Response:* *For lunch, Mom gave me $\frac{3}{4}$ of the pizza that we ordered. I could only finish $\frac{2}{3}$ of*

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Problems remain…

"On one hand, it might be reasonable to applaud NCTM's persistent message on issues of equity and Mathematics for All. On the other hand, the inequitable outcomes that are the focus of NCTM's 26-year lament have also happened on their institutional watch and in the context of all previous recommendations. "

-Danny Martin, NCTM (2015) plenary address


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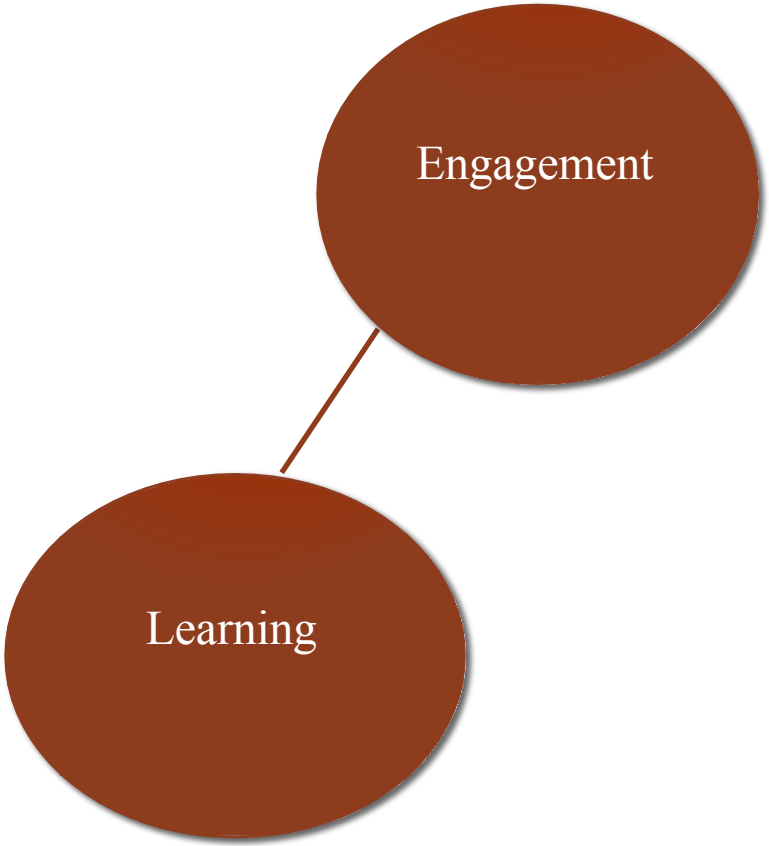
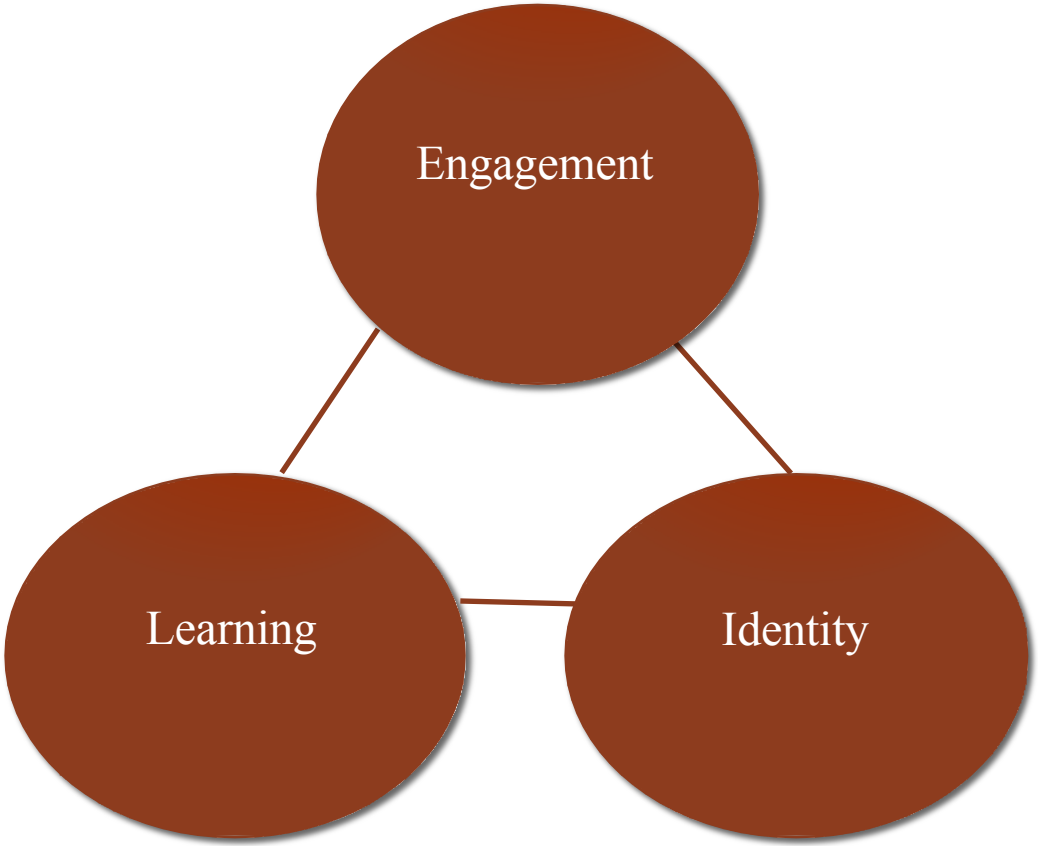
MATEMATİK
FEN ve TEKNOLOJİ
SOSYAL BİLGİLER
GRAFİKLERİMİZ
AĞIRLIK
BOY


Engagement
Learning


Engagement
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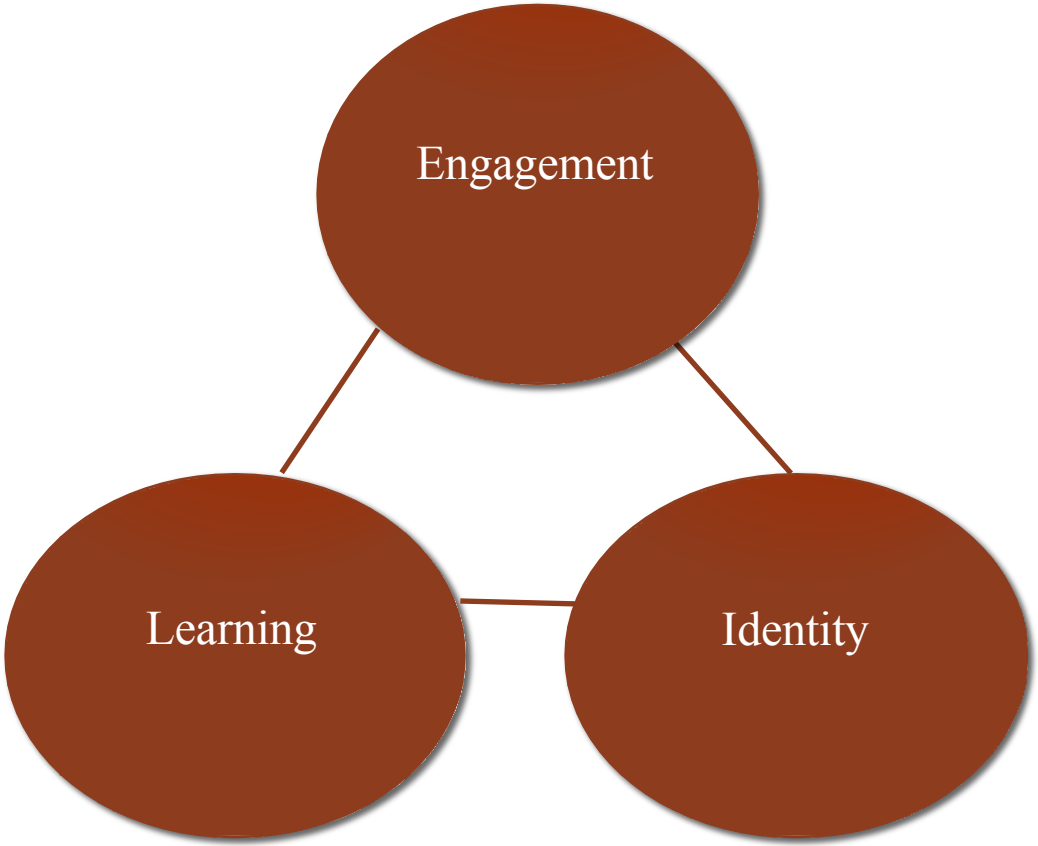
Engagement
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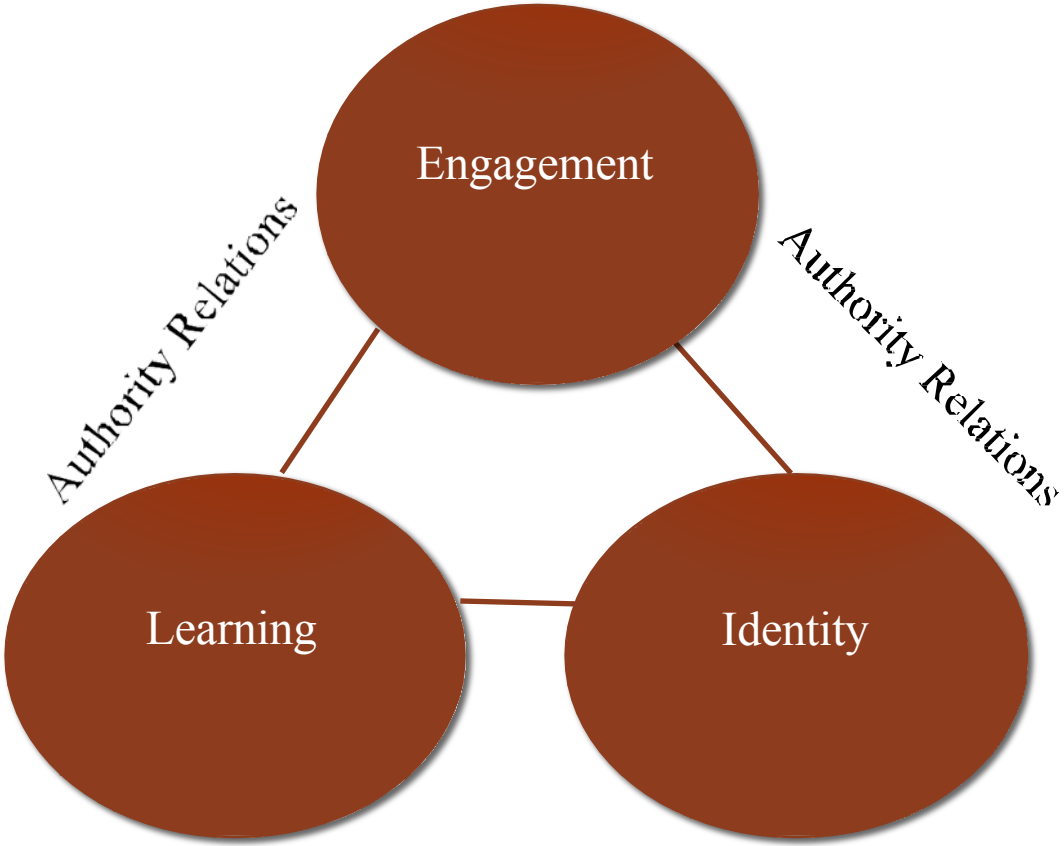
Engagement
Authority Relations
Authority Relations
Learning
Identity


32
2|64
3x4=12
4x4=16
4x5=20
4x6=24


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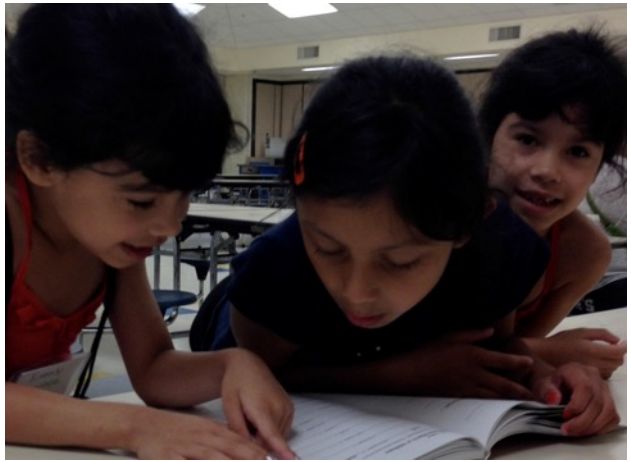

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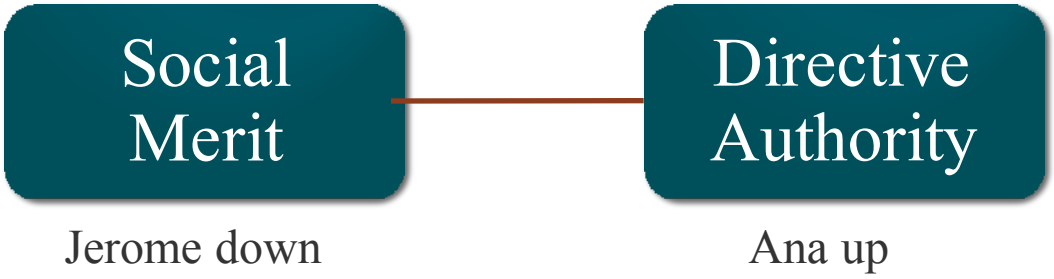
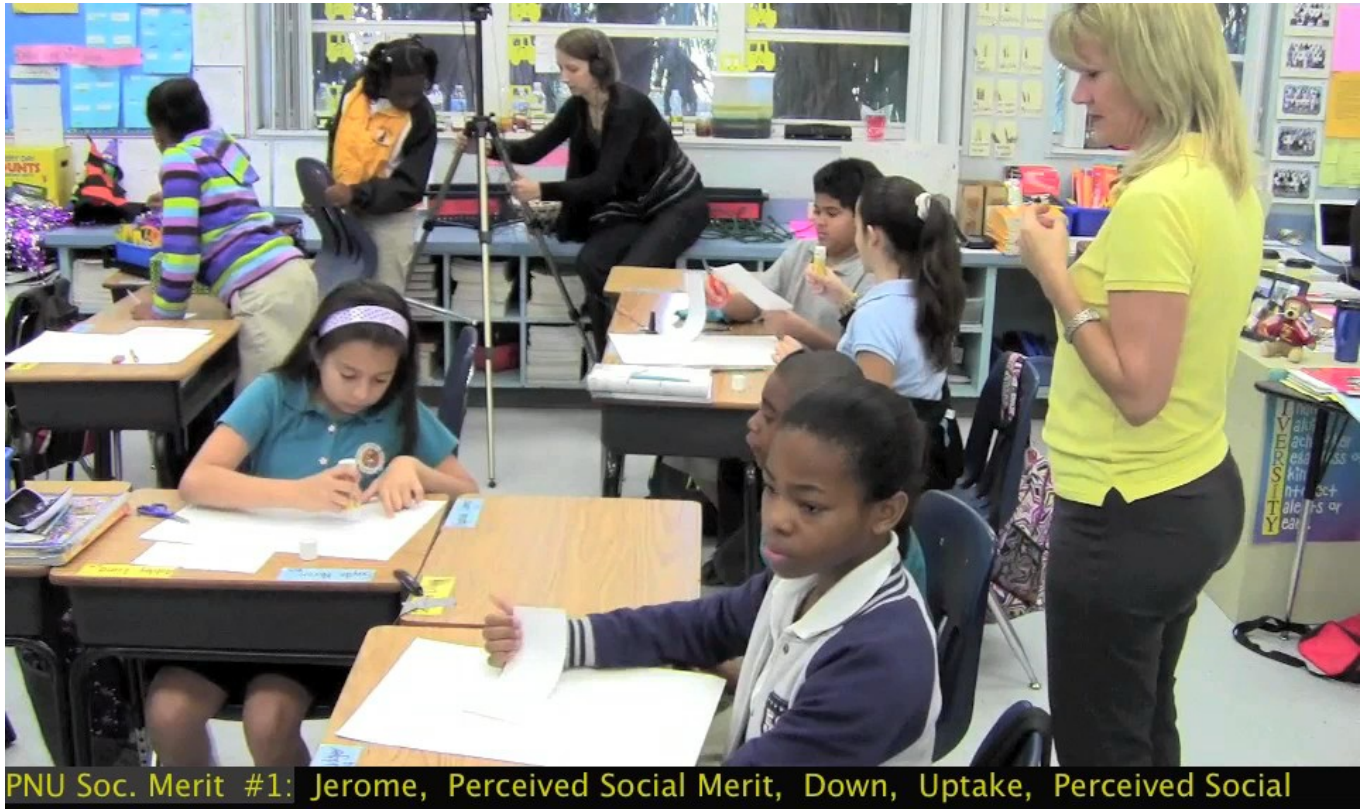
Interactions preceding uptake of each iterative idea were marked by power plays rather than attempts at sense-making.

Power plays were dominated by Ana, who garnered much directive and intellectual authority.

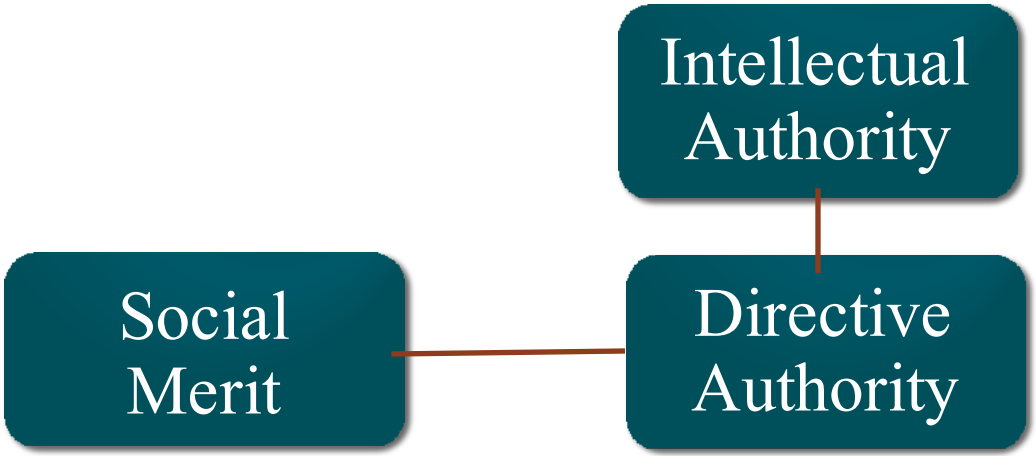
Jerome was positioned as disengaged and in relation to Ana. Jerome's social demotion was linked to Ana's ability to issue directives to Jerome.



Jerome's social merit

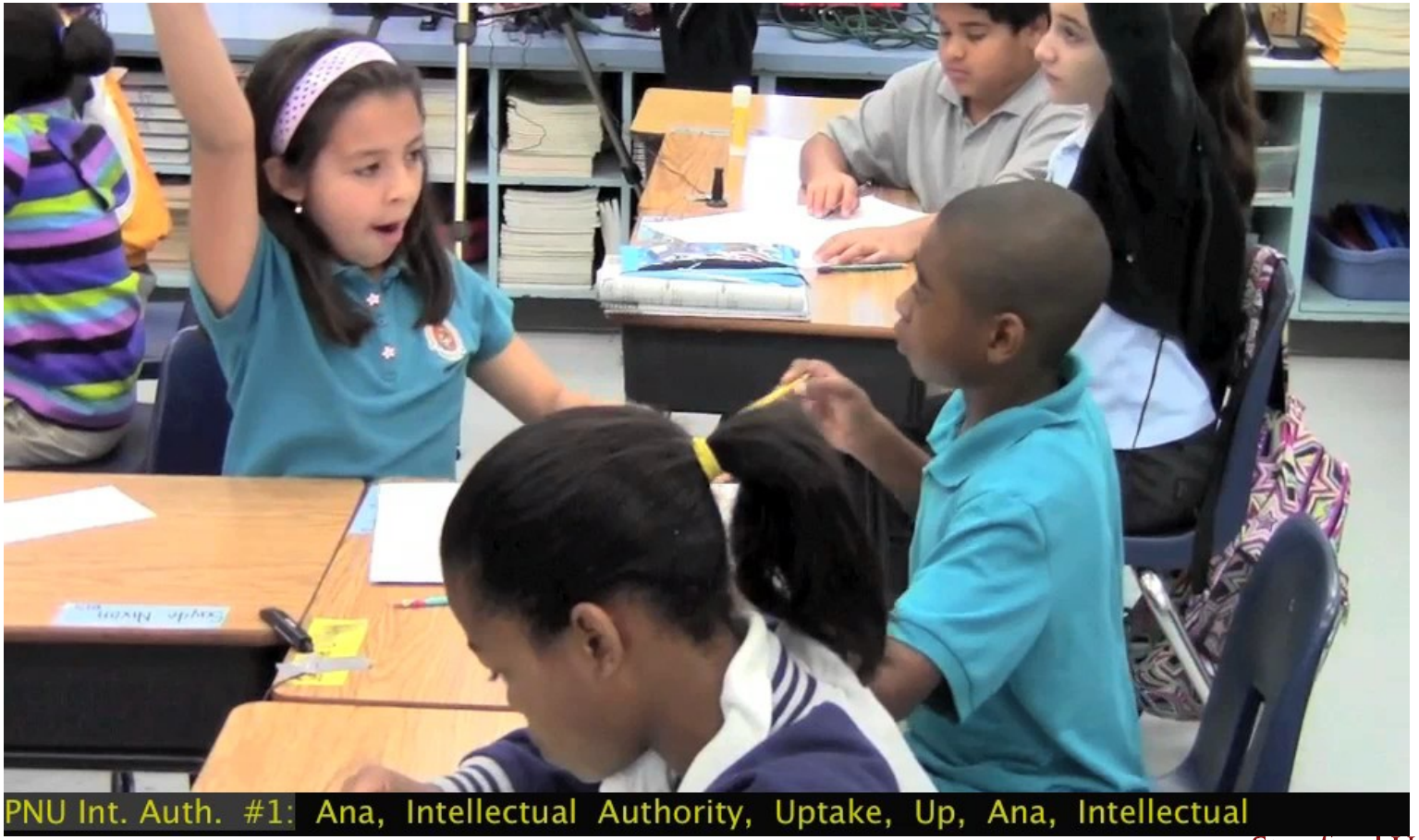


Ana's directive authority became linked to intellectual authority.

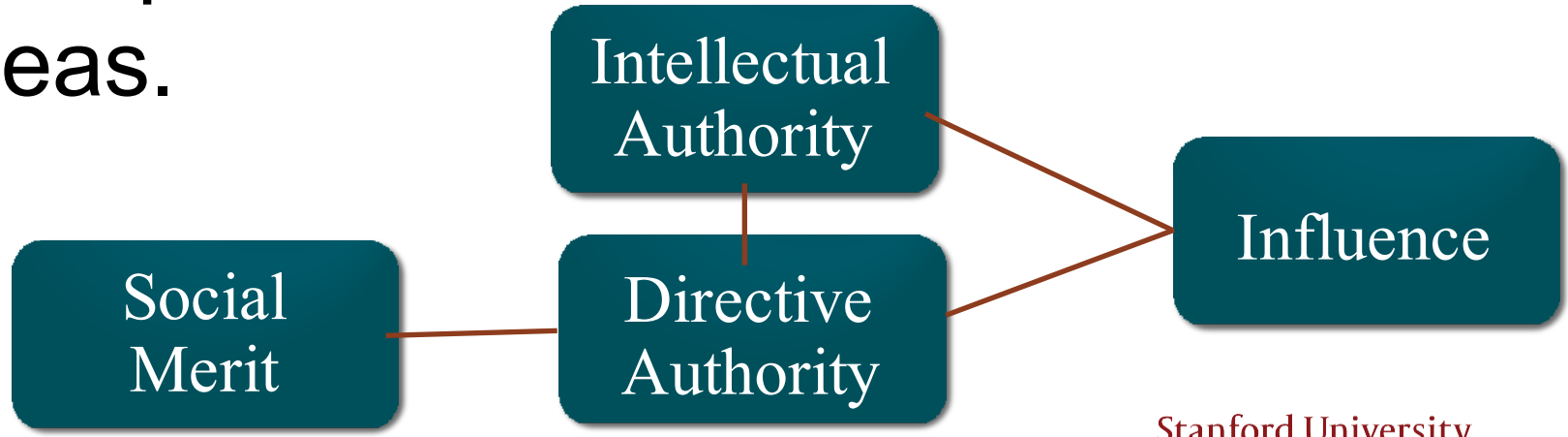


Ana's directive authority

Directive & Intellectual authority



Ana's stronger position of authority led to the uptake of her ideas.

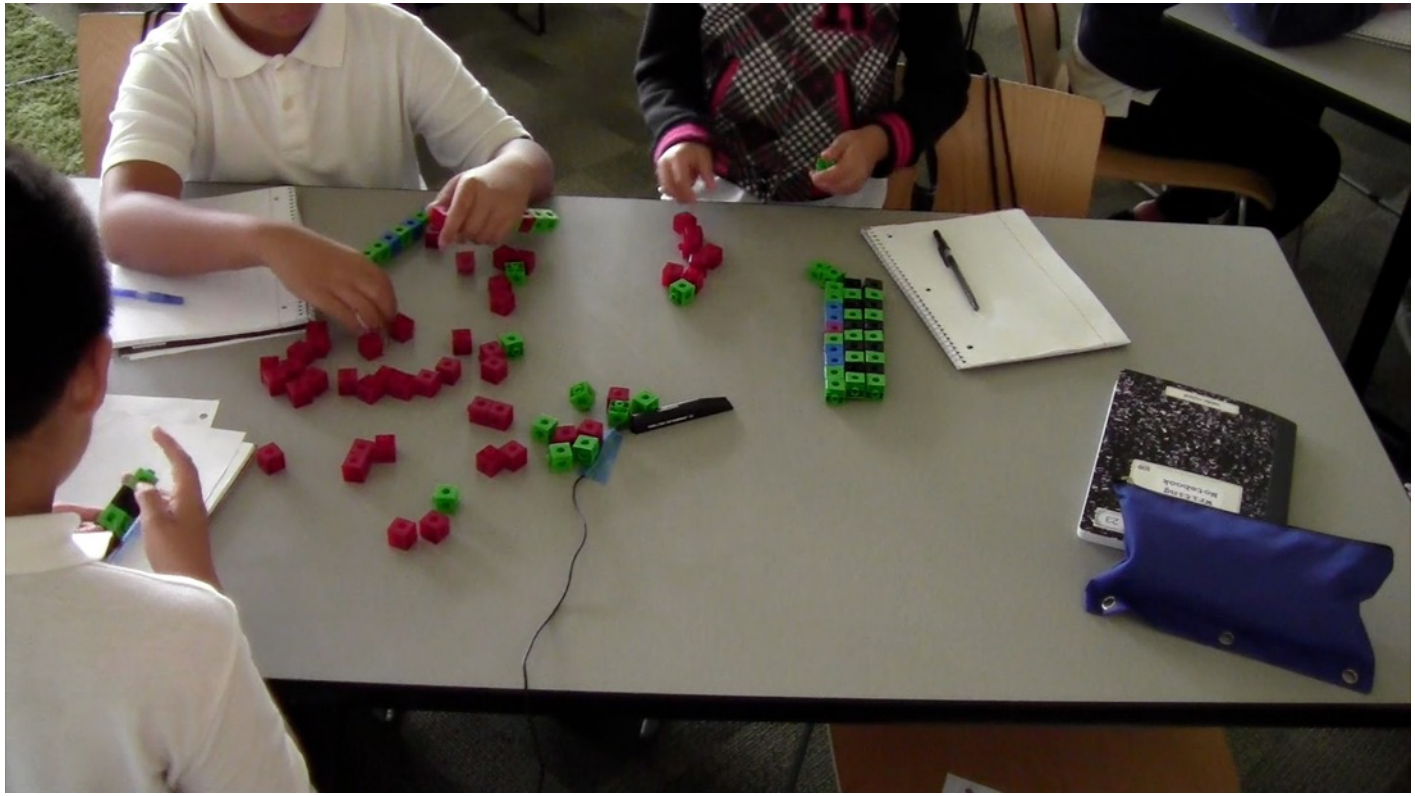


Supporting Teachers' Noticing of Student Authority Relations During Small Group Discussions

- Study Context
- Professional Development
- Year-long Data Collection and Support
- Quick Glance at Emerging Results

Noticing Collaborative Dynamics

Noticing Collaborative Dynamics



Pedagogical Choices from Teachers' Noticing: Student Revoicing in a 1st Grade Class

Pedagogical Choices from Teachers' Noticing: Student Revoicing in a 1st Grade Class

Pedagogical Choices from Teachers' Noticing: 4th Grade 'Productive Partnerships'

Bringing it all together: leading powerful group discussions

Making sense of mathematics

Eliciting

Probing

Revoicing

Connecting ideas

Making sense of joint reasoning

Noticing, naming, and explicitly teaching discursive moves to students (e.g., eliciting, revoicing, etc)

Reflecting on productive partnerships and supporting students in taking ownership over their joint work


THANK
YOU
GRACIAS
ARIGATO
SHUKURIA
DANKSCHEEN
JUSPAXAR
GOZAIMASHITA
EFCHARISTO
KOMAPSUMNIDA
MAAKE
GRAZIE
MEHRBANI
SUKSAMA
EKHMET
TASHAKKUR ATU
YAQHANYELAY
TINGKI
BİYAN
SHUKRIA
BOLZİN
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SPASIBO
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