Evaluating the Impact on Student Achievement of a Facilitated Learning Community Approach to Professional Development

Yaron Doppelt, Eli M. Silk, Matthew M. Mehalik,
Christian D. Schunn, Birdy Reynolds & Erin Ward

University of Pittsburgh

NARST 2006 Annual Meeting (San Francisco, CA)
Thursday, April 6, 2006

Immersion Units

- SCALE - NSF-funded MSP
- Goal 2 is to bring science immersion units to all students K-12 in our partner districts
  - Authentic, extended (4-6 wks)
    - Scientific inquiry investigations or
    - Engineering design projects
  - Focused on core standards-based content
- Districts have been enthusiastic partners
  - Officially adopted curricula & promoted their use
  - Adequately funded instructional materials

Is Current District Policy Enough?

- Well-designed tasks and materials are NOT sufficient for all teachers (Schneider et. al., 2005)
- Current policy of districts is to provide PD opportunities, but make them optional
  - Union contracts that limit what can be required
  - Culture of teacher independence (Briars & Resnick, 2000)
- Research shows mixed results on the impact of PD (Cohen & Hill, 2000)
  - Focus of PD is key for impacting student achievement (Kennedy, 1999)
    - General instructional strategies PD (effect sizes < 0.20)
    - Content-focused PD (effect sizes >= 0.40)

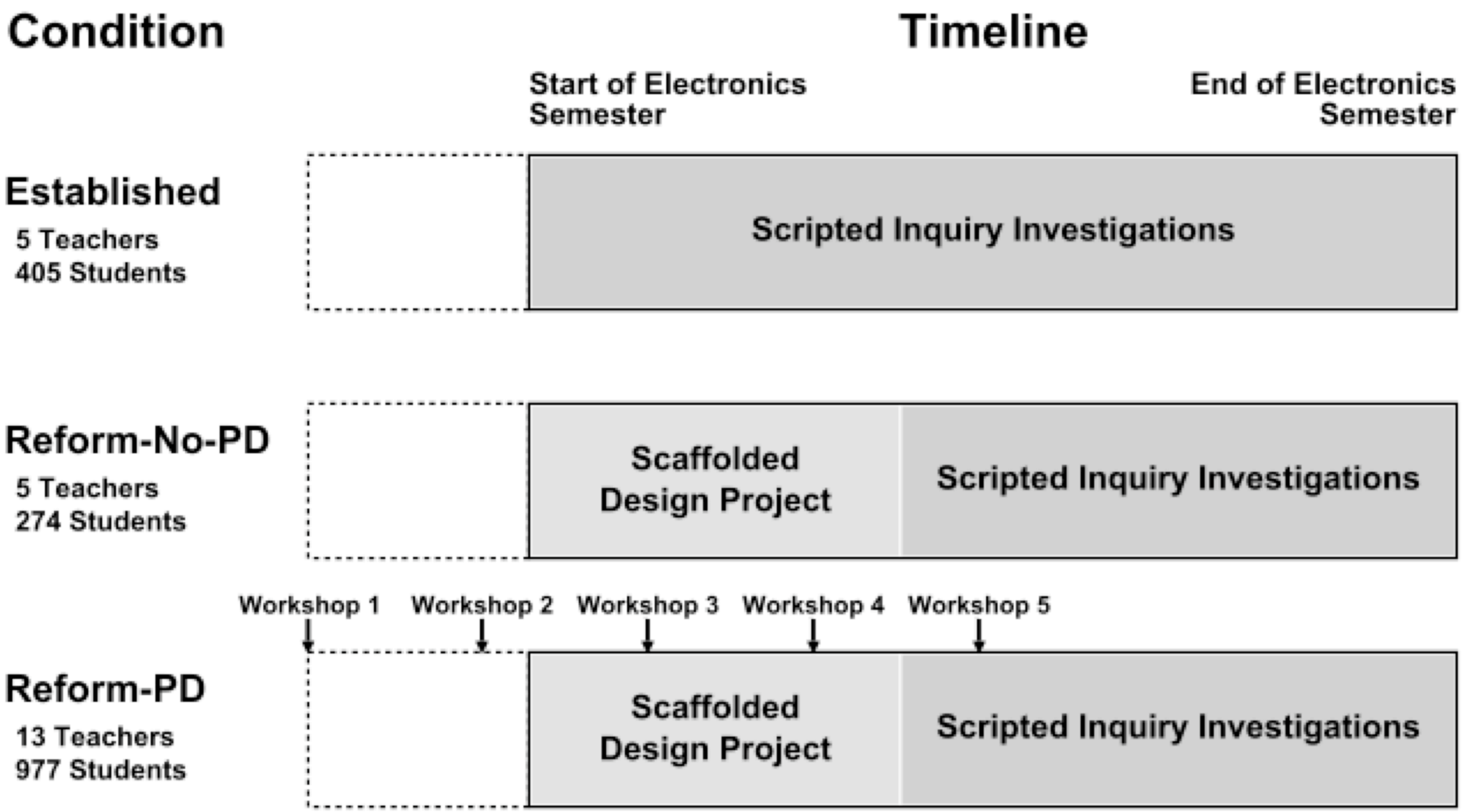
Research Questions

- Is PD important for high-quality enactment of a reform science curriculum?
  - If so, is the impact large enough to be observed at the level of student achievement?
  - If so, what are the features of the PD that may be responsible for facilitating/supporting that high quality enactment?

Study Context and Measures

- District-wide adoption of a reform curriculum
  - Authentic engineering design project
    - Maintain goal of learning science concepts
  - Mid-size urban school district (~2000 8th graders)
    - 70.2% Free/reduced lunch; 66.2% Minority
  - Collected data over two year implementation effort
- Multiple-choice achievement assessment
  - 6 electricity content items covering core concepts in electricity (series vs parallel, ohm's law, etc.)
- Adjusted for covariates (SES, Ethnicity)

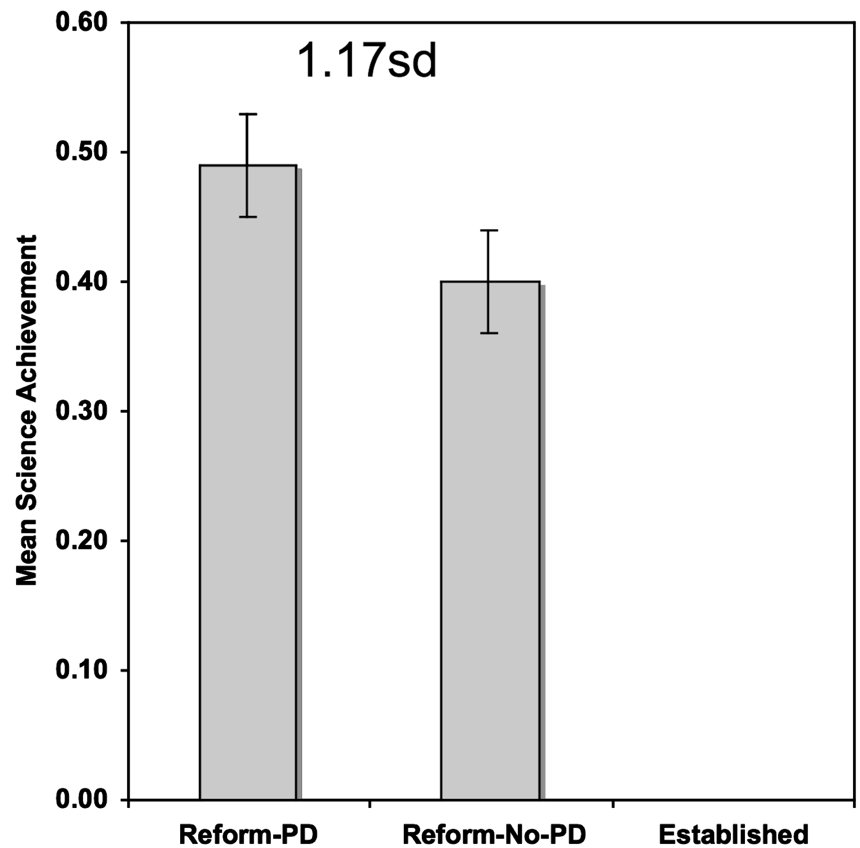
Study Conditions and Timeline



Science Achievement

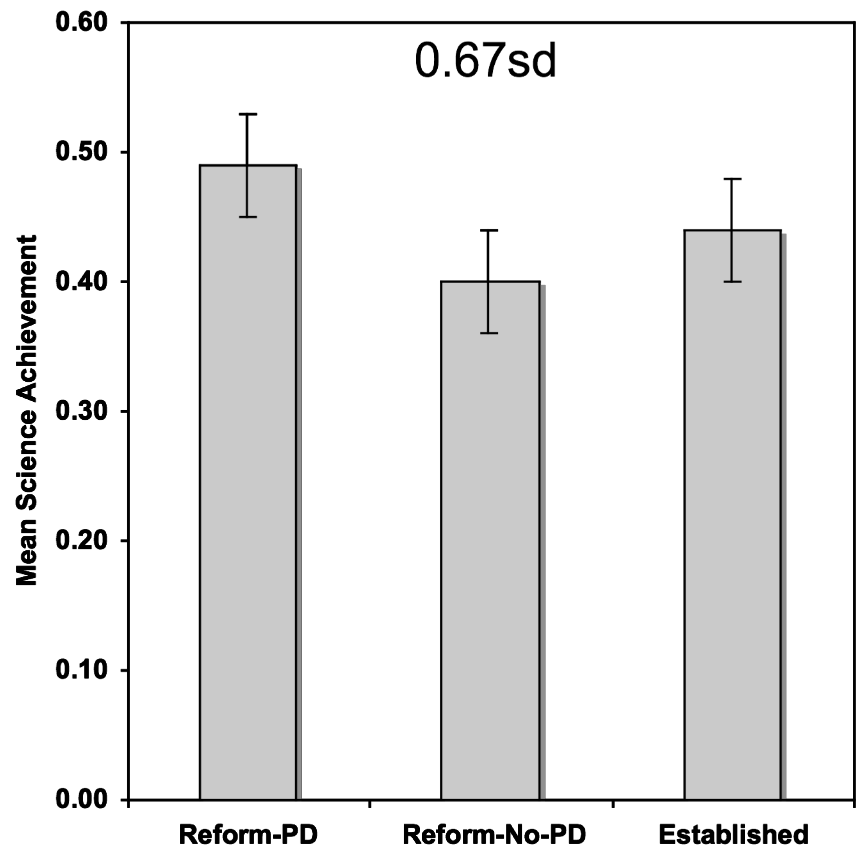
(Adjusted for SES & Ethnicity)

- Participating in PD has a large impact (1.17sd)



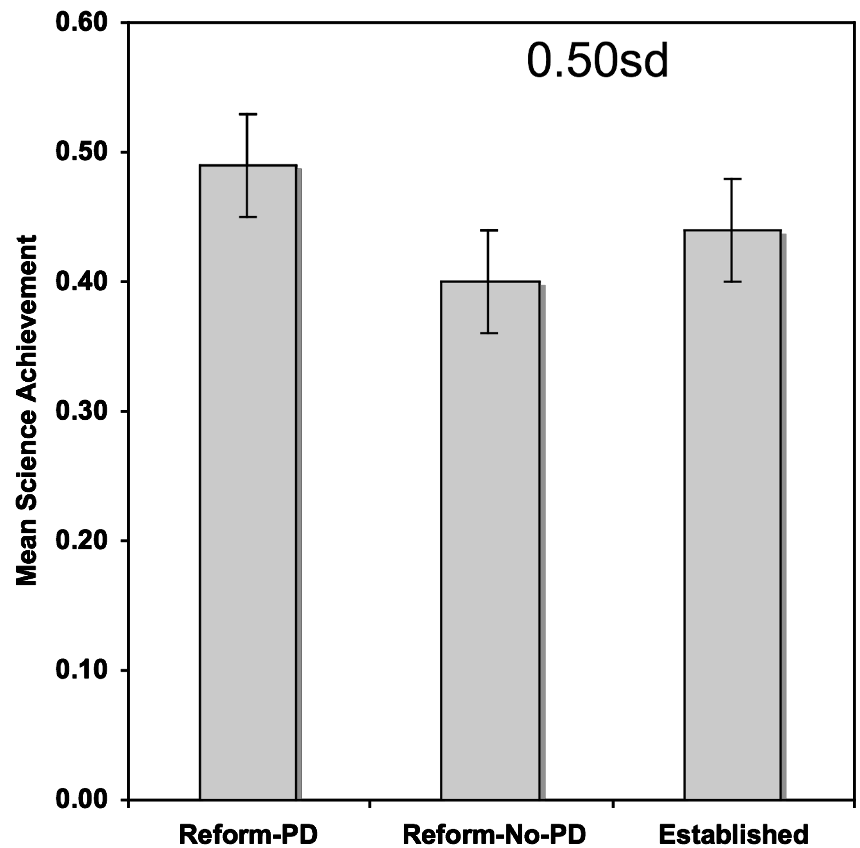
Science Achievement
(Adjusted for SES & Ethnicity)

- Participating in PD has a large impact (1.17sd)
- Reform with PD is higher than Established (0.67sd)



Science Achievement
(Adjusted for SES & Ethnicity)

- Participating in PD has a large impact (1.17sd)
- Reform with PD is higher than Established (0.67sd)
- Reform without PD is lower than Established (0.50sd)
  - Established for 5 yrs
  - Reform is demanding
  - Reform may detract when not enacted well



Design Features of the PD

- Adapted from research (Porter et. al., 2003)
  - Distributed workshops during implementation
    - Given Just-in-Time feedback on problems
    - Immediately put into practice experiences from PD
  - Engaged teachers in active learning
    - Situated in tasks & content of the unit
  - Collaborative community
    - Shared work with peers
    - Guided by knowledgeable facilitators

Content & Pedagogy Resources Acquired from PD

- No-PD Teachers
  - Disconnected and component-based knowledge
  - Value control of limited and predictable exploration space
  - Satisfied with “getting designs to work”
  - Either too open-ended or too proceduralized
- PD Teachers
  - Unified and more general knowledge
  - Value greater learning opportunities from increased exploration space
  - Press for connections of complex designs to underlying content
  - Appropriate use of scaffolds

Conclusions

- Participating in PD focused on the reform unit has a large impact on student achievement
  - Greater than 1sd, which is relatively large (Kennedy, 1999)
- Questioning the wisdom of prevailing district policies
  - Teachers are not required to participate in PD specifically around the reform units being adopted
  - Maybe that is not an effective use of resources?
- When PD is consistent with research on how to be effective (Porter et. al., 2003), it is an indispensable part of reform that should go hand in hand with adoption of new curriculum tasks & materials

Thank You

Eli M. Silk
esilk@pitt.edu

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