

# AMSP Research Conference

June 7, 2007

# The Effects of Peer Coaching on Teachers' Collaborative Interactions and Student Achievement

Sarah Murray  
Centre College

# Purpose of the Research Study

To examine an existing professional development model, the Mentored Implementation Program (MIP), and determine its effects on teachers' collaborative interactions and student achievement

# Research Questions

1. How does the MIP provide support for teachers' collaborative interactions?
  - 1.1. How do teachers perceive the peer partner conferencing experience?
  - 1.2. How do lead mentors perceive the peer partner observation/conferencing experience?
  - 1.3. What do MIP participants experience during MIP post-observation conferences?
    - 1.3.1. What do participants do?
    - 1.3.2. What do participants talk about?
    - 1.3.3. Do teachers reflect upon and analyze their own classroom instruction as they work with their peer partner during the post-observation conference?
2. Will student achievement improve during one year of implementation of the MIP as it is measured through a pre/post-test model?

## Total Participants within the Individual Study

District	School	Control/Experimental	Grade	Teachers	Students
A	1	Control	8	2	36
B	2	Experimental	8	3	70
	3	Control	9	1	23
C	4	Experimental	9	1	37
D	5	Control	7	1	30
	5	Experimental	8	1	51
	6	Control	8	1	16
	6	Experimental	7	1	44
<b>Total</b>				<b>11</b>	<b>307</b>

# School and District Involvement

- Four school districts
- 6 individual schools
  - 4 middle schools
  - 2 high schools
- 2 middle schools each had 1 teacher in the experimental group and 1 teacher in the control group

# Combination of Quantitative and Qualitative Research Methods

- **Quantitative:** Research on Student Achievement using a pre/post-test
- **Qualitative:** Research on Teachers' Perceptions of the MIP through questionnaires, audio-taped post-observation conferences, and lead mentor data



# **The Heart of the Study**

**Results**



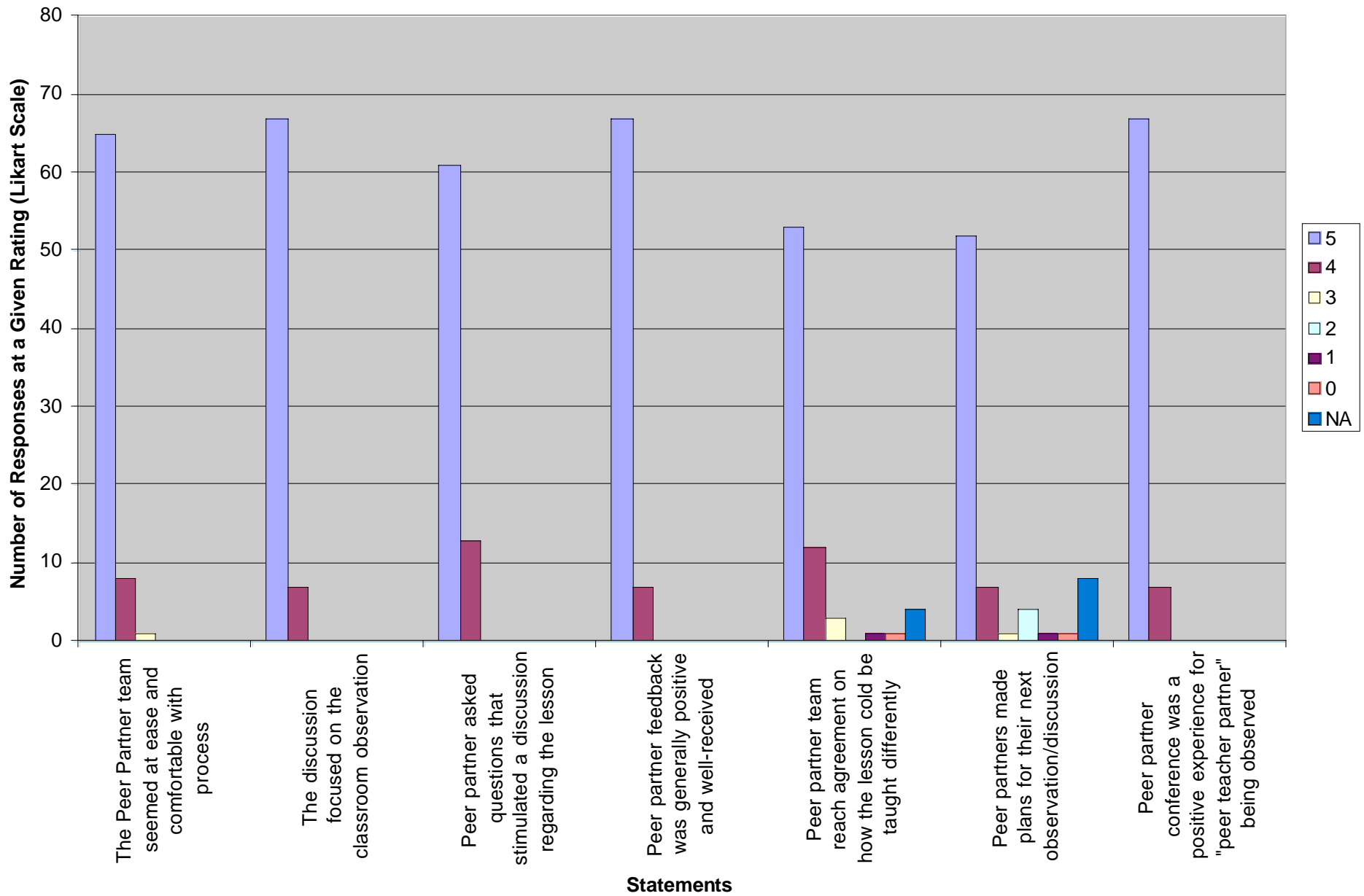
# Results from the Likert Portion of Peer Partner Assessment

Scale:

5 – Strongly Agree

1 – Strongly Disagree

## Peer Partner Assessment 2005 – 2006 (N = 74)



# Results from Open-ended Responses

Participants were asked to give examples of the following:

- Positive aspects of the peer partner conference
- Aspects of the peer partner conference which need improvement
- “Barriers” or “roadblocks” encountered by this peer partner team

# Positive Aspects of the Peer Partner Conference (N = 57)

Category	n (%)
Sharing of ideas, techniques, and/or strategies	27 (47.37)
Getting feedback and the perspective of another teacher	14 (24.56)
Observing another teacher	13 (22.81)
Discussion or communication with another teacher	11 (19.30)
Supporting one another	2 (3.51)
Total responses	57 (100.00)

# Aspects of the Peer Partner Conference Which Need Improvement (N = 30)

Category	n (%)
None or not applicable	13 (43.33)
Stated the conference was smooth, positive, or great	7 (23.33)
Time	3 (10.00)
Response related more to summer institute	3 (10.00)
Scheduling	2 (6.67)
Same school peers	1 (3.33)
More discussion	1 (3.33)
Total	30 (100.00)

# Barriers or Roadblocks Encountered (N = 36)

---

Category	n (%)
None or not applicable	14 (38.89)
Scheduling	14 (38.89)
Distance	5 (13.89)
Timing	3 (8.33)
Getting a substitute	1 (2.78)
Total	36 (100.00)

---

# Relationship Between Individual Questions

- A high correlation existed between the majority of individual statements on the peer partner assessment form. This suggests that the peer partners consistently rated the MIP peer coaching experience positively.



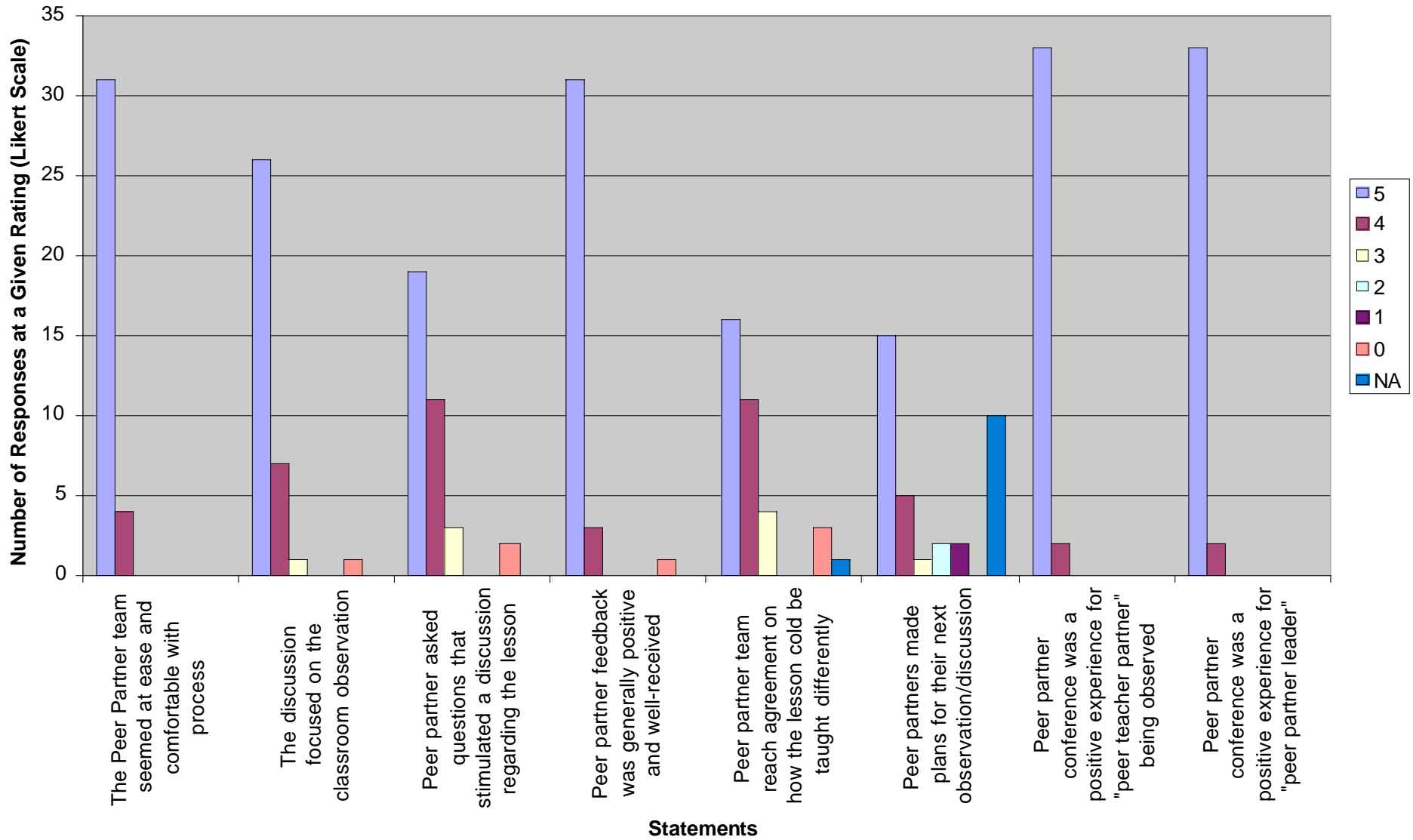
# Results from the Likert Portion of the Lead Mentor Assessment

Scale:

5 – Strongly Agree

1 – Strongly Disagree

## Lead Mentor Assessment 2005 – 2006 (N = 35)



# Lead Mentor Reports – May 2006

Lead mentors were asked to report overall on the following items:

- Greatest benefits of the MIP
- Greatest barriers in the MIP
- Recommendations/suggestions for improving the MIP

# Greatest Benefits of the MIP

---

Category	n (%)
Communicating, networking, and collaborating of teachers	9 (100.00)
Sharing of ideas	3 (33.33)
Observing another teacher	3 (33.33)
Supporting one another	3 (33.33)
Total	9 (100.00)

---

# Greatest Barriers of the MIP

---

Category	n (%)
Scheduling	7 (77.78)
Timing	5 (55.56)
Distance	4 (44.44)
Teachers not responding to their email	4 (44.44)
Teachers having a change in position	1 (11.11)
Total	9 (100.00)

---

# Suggestions for Improving the MIP

Category	n (%)
Additional follow-up meetings for peer partners and lead mentors	5 (55.56)
Continued emphasis on schools sending teams of teachers from the same grade level and content area to the institutes	3 (33.33)
Making sure teachers clearly understand their roles in the MIP or possible contract	2 (22.22)
Having teachers complete a more comprehensive information sheet to aid in scheduling (class schedule, district breaks, home and school phone numbers, etc.)	1 (11.11)
Total	9 (100.00)

# Analysis of Post-Observation Conferences



Group	Length of Conference (min)	Participant	Identification	Grade	Observer/Observee
1	19	Teacher 1	T1.1	9	Observee
		Teacher 2*	T2.1	9-12	Observer
		Lead Mentor 1	LM1		
2	13	Teacher 1	T1.2	7	Observee
		Teacher 2	T2.2	8	Observer
		Teacher 3*	T3.2	8	Observer
		Lead Mentor 1	LM1		
3	7	Teacher 1	T1.3	8	Observer/Observee
		Teacher 2	T2.3	8	Observer/Observee
		Lead Mentor 1	LM1		
4	14	Teacher 1	T1.4	8	Observer/Observee
		Teacher 2*	T2.4	9-12	Observer/Observee
		Lead Mentor 2	LM2		

# Conferencing Experience

- Average conference time - 13.25 minutes
- Average number of topics discussed - 12
- Overall Topics:
  - Organization of learning or classroom management
  - Mathematics content or pedagogy

# Types of Interactions During Post-observation Conference

## ■ Questions

- Group 1 – 8.8%
- Group 2 – 5.5%
- Group 3 – 12.6%
- Group 4 – 8.6%

## ■ Statements

- Group 1 – 88.8%
- Group 2 – 85.5%
- Group 3 – 83.0%
- Group 4 – 91.3%

## ■ Compliments

- Group 1 – 2.3%
- Group 2 – 8.6%
- Group 3 – 4.2%
- Group 4 – 0.0%

# Group 1: Summary

- Length of Conference – 19 minutes
- Number of Interchanges – 76
- Number of Topics Discussed – 18
- Grade Level Taught
  - Observee - 9<sup>th</sup>
  - Observer - 10<sup>th</sup> – 12<sup>th</sup>
- Peer Partners in the Same School
- Overall Discussion
  - Organization of Learning and Classroom Management – 44.44% of Discussion
  - Content and Pedagogy – 50.00% of Discussion
  - Other – 5.56% of Discussion

# Group 2: Summary

- Length of Conference – 13 minutes
- Number of Interchanges – 39
- Number of Topics Discussed – 13
- Grade Level Taught
  - Observee - 7<sup>th</sup>
  - Observers - 8<sup>th</sup>
- Peer Partners in the Same School District
- Overall Discussion
  - Organization of Learning and Classroom Management – 38.46% of Discussion
  - Content and Pedagogy – 61.53% of Discussion

# Group 3: Summary

- Length of Conference – 7 minutes
- Number of Interchanges – 20
- Number of Topics Discussed – 7
- Grade Level Taught
  - Observee/Observer - 8<sup>th</sup>
  - Observee/Observer - 8<sup>th</sup>
- Peer Partners in the Same School
- Overall Discussion
  - Organization of Learning and Classroom Management – 14.29% of Discussion
  - Content and Pedagogy – 85.71% of Discussion



# Group 4: Summary

- Length of Conference – 14 minutes
- Number of Interchanges – 125
- Number of Topics Discussed – 10
- Grade Level Taught
  - Observee/Observer - 8<sup>th</sup>
  - Observee/Observer - 10-12<sup>th</sup>
- Peer Partners in the Same School District
- Overall Discussion
  - Organization of Learning and Classroom Management – 50.00% of Discussion
  - Content and Pedagogy – 10.00% of Discussion
  - Other – 40.00% of Discussion



# Themes and Patterns in the Data

- Description vs. Analysis
- Positive Tone and Support
- Proportional Patterns of Talk
- Breadth, not Depth in Discussion

# Analysis of Pre-Post Content Knowledge Test

Number of Students in the Experimental Group - 202

Number of Students in the Control Group - 105

# Experimental Group

- Scores slightly decreased for two subgroups
- Average pre-test scores ranged from 30.94% to 50.50%
- Greatest positive difference in average scores from the pre-test to the post-test was only 6.58%
- Highest percentage of scores to increase for any given subgroup was 61.54%
- Lowest percentage of scores to increase for any given subgroup was 33.33%

# Control Group

- Scores decreased slightly for one subgroup
- Pre-test scores ranged from 29.10% to 50.44%
- The greatest positive difference in average scores from the pre-test to the post-test was 7.29%
- Highest percentage of scores to increase for any given subgroup was 62.50%
- Lowest percentage of scores to increase for any given subgroup was 33.33%

# Further Results from the Descriptive Statistics

- Majority of the students increased their scores over the course of the semester.
- Actual change in scores tentatively shows no significant difference between the two groups.
- The two groups, experimental and control, were very similar.
- Mean test scores for both groups were low.
- Mean pre-test and mean post-test scores for the experimental group were higher than the control group.

# Multiple Regression to Determine Inferential Conclusions Regarding Student Achievement

Two Tests



# First Test

- Tested for interaction to determine if the MIP (treatment) effects were dependent on students' previous mathematical knowledge and/or ability.
- The *INTERACTION* variable did not have a significant effect.
- Therefore, a second test was run.



# Second Test

- A second test was run without the *INTERACTION* variable to determine if the intervention (MIP) had an effect on the mean test scores.
- Thus, the mean effects associated with the variables, *PRE-TEST-SCORE* and *EXPCONT*, were interpreted through this second test.
- Can infer through multiple regression that there was no significant difference in the results of the experimental group and the control group.

# Results

- Results would seem to indicate that the MIP did not have a direct effect on student achievement.
- For the intervention group of students, multiple regression analysis revealed that peer coaching had no significant on the Programme For International Student Assessment (PISA)-based standardized achievement test that emphasized real-life mathematical skills rather than mastery of a particular school curriculum.

# Discussion

# Principal Findings

 The overall experiences for the teacher and lead mentor participants

 The effects on mathematics achievement for participating students

# Overall Experiences

- Both peer partners and lead mentors indicated that the MIP was a positive experience.
- Statistical analysis consistently supported participants' positive responses.
- Post-observation conferences indicated the nature of teachers' collaborative interactions.
- Discussions were
  - relatively brief
  - not necessarily completed on the same day as the classroom observation
- Teachers did not challenge or question each other's practices.
- The role of observer or observee was not clearly defined during the post-observation conference.
- The lead mentor served as a facilitator during the discussion.

# Student Achievement

- Comparison of the experimental and control groups using multiple regression found that peer coaching as implemented through the MIP had no significant effect on a shortened version of the Programme For International Student Assessment (PISA) mathematics achievement test emphasizing real-life mathematical skills rather than mastery of a particular curriculum.
- The short duration of this particular study may account for the lack of improvement in student achievement.



# Link to the Literature



# Collaborative Interactions

- Peer coaching through the MIP did not have the following characteristics that have been shown through research to promote collaborative interactions:
  - “Feedback request” in which teachers are encouraged to critique each others thinking
  - “Reflection and rethinking” as defined in Wenger’s (1998) “Communities of Practice”
- Collaboration included discussion that was more descriptive and less analytical.

# Mentor vs. Coach

- Within the Mentored Implementation Program (MIP), peer partners fit the definition of coach more closely than mentor. Their primary responsibility was to “provide support” for one another as they implemented materials from the summer institute.

# Barriers

- This study agreed with many others on the following factors that restricted the effectiveness of coaches:
  - Time
  - Scheduling
- Peer partners often found it difficult to schedule a convenient time to not only observe but to conference. Conferences did not always follow the classroom observation.

# Role Ambiguity

- This study supports the literature on role ambiguity.
- The role of the coach is not always clearly defined.
- In two of the four post-observation conferences, the role of observer (coach) and observee was unclear. Peer partners were trying to discuss two classroom observations during one conference that did not even follow either observation.

# Characteristics Common to Peer Coaching Programs



Non-evaluative



Based on classroom observation with feedback



Intended to improve instructional strategies or techniques

- Peer coaching through the MIP exhibited the first two characteristics. However, can teachers improve instructional strategies or techniques if they do not evaluate or actually assess the instruction they are observing?



# Greater Classroom Implementation

- Joyce and Showers (2002) indicated that teachers who had received continued technical support through coaching by an outside expert or peer were more likely to achieve greater classroom implementation.
- Having the MIP as a follow-up to the summer institutes provided accountability for the teachers. When observed by a peer partner and/or lead mentor, teachers were expected to implement strategies and techniques from the summer institute.
- Does peer coaching make teachers more accountable regardless of the expertise of the coach?

# Positive Teacher Responses

- Like other studies involving coaching, teachers were very positive about the benefits of the MIP.



# How was this study different?

- Went beyond classroom observations and teacher interviews to collect empirical data on the collaborative interactions of the peer coaches during the post-observation conference.
  - Analyzed actual conversations
- Analyzed the effects of the MIP on student achievement.

# Limitations of this Study

# Volunteerism

- Participation in this study for both the experimental and control group was voluntary.
- Therefore, the researcher could not control, for example, the relative years of experience of the teachers participating.

# Years Experience

## ■ Experimental Group

- Female – 2 years
- Male – 4 years
- Female – 2 years
- Female – 10 years
- Male – 16 years
- Female – 3 years

## ■ Combined years experience – 37 years

## ■ Control Group

- Female – 32 years
- Female – 0 years
- Male – 22 years
- Male – 2 years
- Female – 9 years

## ■ Combined years experience – 65 years

# Time

- Does the short duration of this particular study account for the lack of improvement in student achievement?
- A more in depth longitudinal study of peer coaching as it is implemented through the MIP and through other professional development models is needed!

# Policy Implications

# How does this study have policy implications for teachers?

- Teachers are held accountable for mathematics achievement at both the **state** (Kentucky Core Content) and **national** (No Child Left Behind) level!
- Through HB 93, Kentucky has already made a commitment to training mathematics coaches.
- Determining how to link coaching to improved student achievement: For example, can more “collaborative interactions” involving in depth analysis ultimately translate to improved student achievement?



# Policy Implications for the MIP

## Structural Regulations:

- Requiring coaching and mentoring training by an “expert” for lead mentors and both teachers in a peer partner relationship.
- Training that involves more role playing to help bring clarity to the role of each peer partner.
- Training that encourages and illustrates collaborative interactions.
- Requiring teachers to videotape the observed lesson if the post-observation will not occur during the same day.

# More Stringent Regulations

- Attendance to the AMSP institute with a peer partner from the same school or district.
- Written agreement by both the teacher and principal that the teacher will fulfill his or her MIP requirements.
- Attendance to the coaching and mentoring training which is imperative to the success of teachers' collaborative interactions during the post-observation conference.
- Completion of a minimum of two classroom observations as an observer followed by the corresponding post-observation conferences.
- Completion of a minimum of two classroom observations as the observee followed by the corresponding post-observation conferences.

# Regulations Continued

- A substitute teacher during the scheduled classroom visit and post-observation conference to alleviate time constraints.
- Formative evaluation and feedback so that the peer partner has a basis for reflection and examination of his or her own practices.
- An instrument that would help guide improved performance and focus the discussion during the post-observation conference.

# Recommendations for Further Research

# For Further Examination

- What would be considered an appropriate number of observations, conferences, informal discussions, etc...?
- What types of training would help teachers to truly be collaborative and more analytical about their work?
- Is there a difference between teacher-mentor relationships and peer coaching relationships?



# What have we learned?

- Peer partners and lead mentors perceive the MIP as a positive experience.
- Teachers collaborative interactions lack in depth analysis.
- Further longitudinal research is necessary before discounting the benefits of peer coaching on student achievement.