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Co-teaching Partnerships for Excellence in the Age of Accountability: A Preliminary Study of the Effects of Co-teaching in Student Teaching

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ABSTRACT

State and national accountability measures for teachers and administrators have made districts reluctant to accept teacher candidates for clinical or fieldwork experience in the traditional take-over model. Difficulty placing teacher candidates in the field prompted the School of Education at Richard Stockton College to research innovative student teaching models in order to strengthen clinical partnerships with P-12 school districts. Prior studies of co-teaching for student teachers from St. Cloud State University showed that this model provided many benefits to the teacher candidate and cooperating teacher, as well as notable gains in student achievement. That research inspired this pilot study in New Jersey. The pilot study identified co-teaching strengths in professionalism, teaching time, student learning and cooperating teacher growth, with implications for strengthening future research.

Introduction

As noted by Guyton and McIntyre, university based teacher preparation has remained largely unchanged for the last 100 years (Heck, Bacharach, & Dahlberg, 2008). Although teacher candidates often cite the student teaching experience as one of the most influential and powerful parts of their preparation, there remains a disconnect between the content, theory and pedagogy taught in higher education classrooms and the clinical practice that takes place in P-12 classrooms. National reform reports have called for stronger clinical practice and shared decision-making partnerships with P-12 districts, but high stakes compliance burdens cause hesitation on both sides.

Recent reform and high stakes accountability in P-12 classrooms have changed the educational landscape and ushered in several sweeping changes for simultaneous implementation in a system already serving students with more needs than ever, stretching already strained budgets. These reforms have included higher education, particularly pressing Educator Preparation Programs (EPPs) to strengthen clinical partnerships, precisely at the same time that K-12 reforms in Common Core State Standards (CCSS) and teacher performance assessments have made districts reluctant to accept teacher candidates for clinical fieldwork experience.

Like many other states, New Jersey sought its NCLB waiver on condition of adopting the CCSS on an aggressive timeline, and at the same time as imposing performance assessment systems that include student achievement measures. As a result, most districts focused first on selecting and training staff on performance assessment systems, leaving little or no time to examine the CCSS. After conducting a teacher performance assessment pilot during the 2013-14 school year, the state replaced its NJASK and HSPA exams to a CCSS-aligned instrument from

one of the two national testing consortia: the Partnership for Assessment and Readiness of College and Career Standards (PARCC).

Understandably, these nearly simultaneous reforms make school district officials reluctant to accept teacher candidates for a clinical experience, which requires turning over classrooms to preservice educators for 14 weeks in a traditional student teaching model. The reluctance stems from anxiety about the scores that P-12 students earn on the state assessment, which partially determines the teachers' own performance scores. These scores attach to the fully certified teacher of record for the class, regardless of the fact that a non-certified teacher candidate may have taught the class for 15 weeks. The NJ Department of Education (NJDOE) has refused to grant any high stakes relief or incentive to the school or teacher of record for hosting a student teacher. Although successful completion of clinical practice is necessary for teacher candidates to attain certification in New Jersey, many teachers and their principals are not willing to place their careers on the line to host a teacher candidate whose impact on test scores is unknown. New Jersey EPPs, like much of the rest of the nation, recognized the need to re-examine student teaching partnerships in light of high-stakes accountability-based reluctance.

Nonetheless, the student teaching experience remains one of the most critical parts of teacher preparation because it is where theory meets practice (Ronfeldt & Reininger, 2012; Anderson, 2013). Challenged to increase the duration and quality of their clinical partnerships, and faced with compliance burdens on both sides, most EPPs and schools have felt the strain on their strong informal partnerships. This strain prompted the School of Education at Stockton College to research innovative student teaching models that might strengthen clinical partnerships with P-12 school districts in a way that would not jeopardize their reform-based compliance burdens. A literature search revealed a co-teaching model of student teaching from

St. Cloud State University in Minnesota who, several years before, had been experiencing similar reluctance to their teacher candidates due to state mandated NCLB assessments (Bacharach & Heck, 2012). Their studies showed that co-teaching had many benefits for the teacher candidate, cooperating teacher and most important, the K-12 students, including student achievement. Those research findings prompted us to conduct a pilot study to see whether the impact would be similar in New Jersey.

From an instructional perspective, the co-teaching model was timely because teachers increasingly find themselves in co-teaching situations, due to improved access to mainstream classes by those students with disabilities and as a response to intervention for struggling learners (Parker, McHatton, Allen, & Rosa, 2010). Students placed in the least restrictive environment for their particular area in need of assistance means that the teacher of record is seldom the only adult in the classroom. The isolation experienced during a traditional student teaching experience does not provide the communication and collaboration skills teacher candidates need to ensure high levels of student achievement in today's classrooms because today's teacher candidates must be able to direct students and work with other adults.

Stockton began the pilot study in co-teaching during the 2013-14 academic year with the hope that preliminary findings might both support excellence in accountability and be useful for scaling up the model during the 2014-15 academic year. The purpose of this quasi-experimental case study is to determine the effects of a co-teaching model of student teaching on teacher candidate performance, cooperating teacher satisfaction, and K-12 student achievement.

Literature Review

Much of the research on the fieldwork component of teacher preparation has focused on the disconnect between university-based preparation and the “wash out” effect (Zeichner &

Tabachnick, 1981; Zeichner & Gore, 1990) experienced by candidates when they enter their field experiences. Other studies have concentrated on examining the redefinition of the student teaching experience to make it more meaningful and instructive for teacher candidates, with a focus on a social constructivist approach to teacher preparation (Bullough, Young, Birrel, Clark, Eagan, Erickson, Frankovich, Brunetti, & Welling, 2003; Valencia, Martin, Place, & Grossman, 2009). This conceptual framework approach views learning to teach as a socially constructed and collaborative endeavor, one in which less experienced and more-experienced colleagues learn from each other through exchange of ideas. However, the differences between a cooperating teacher and a student teacher candidate create an unintended imbalance during a traditional student teaching experience.

For many years, practitioners and research have suggested co-teaching as a way to restructure schools in the US (Trump, 1966) and England (Warwick, 1971). Co-teaching became most widespread with two fully certified teachers in a classroom working with special needs students in a mainstreamed setting, or with two teachers of different subject areas working together to teach cross-curricular classes. As a reform initiative, Friend and Cook (1990) stressed the importance of training pre-service candidates in collaboration skills in order to alleviate some of the isolation experienced in the profession. However, co-teaching was not a term used in student teaching because it did not meet the common definition of two fully certified teachers, with parity, working together to make curricular decisions (Cook & Friend, 1995).

Grounded in their work with special needs students, Dynak, Whitten, & Dynak, (1997) argued that co-teaching could be an effective model of student teaching for all teacher candidates to develop their collaboration skills. Walsh & Snyder (1993) compared student achievement on statewide assessments in co-teaching classrooms to traditional classrooms and found that scores

were significantly higher in co-teaching classrooms. The study prompted Kansas State University to try co-teaching as a means of alleviating problems they were having with their professional development schools. The inexperience of student teachers and the frustration of cooperating teachers who had to sit by and observe caused teachers and parents alike to complain (Maughmer, Perl, & McQueen, 1999). They found that with co-teaching, as the student teacher progresses in confidence and competency throughout the student teaching experience, the advantage of having an additional, trained adult to work with students is evident in terms of student achievement. Bacharach, Heck, and Dahlberg (2010) observed that co-teaching as an alternative student teaching structure influenced the learning experiences and outcomes of teacher education candidates, their cooperating teachers, and the children in their classrooms at St. Cloud State University. Hartnett et al. (2013) replicated several of the St. Cloud findings in their co-teaching pilot at the University of Central Missouri.

The potential advantages to a co-teaching approach suggested in these studies may increase learning for P-12 students, teacher candidates, and the cooperating teachers in whose classrooms they practice. In a co-teaching model, cooperating teachers make explicit what they do implicitly every day, while teacher candidates learn about classroom management, instruction, and relationship building in a manner not easily described in textbooks or a theory class. Roth, Masciora, and Boyd, (1999) note that the idea of teaching how to do the right thing at the right time is complex. Co-teaching allows the teacher candidate to observe and question a cooperating teacher throughout the experience and ask questions to develop the connection between content, pedagogy, and methodology. As noted by Murphy & Beggs (2006) and Murphy Beggs, Carlisle & Greenwood in Scantlebury et al. (2008), international studies on the use of the co-teaching model during preservice teaching practice show increased scores for the

teacher candidates as well as improved attitudes towards the subject matter from the students in the class. Roth et al. (2004) studied co-teaching in a high school science classroom, finding that the presence of a co-teacher increases access for students to social and material resources and concluding that co-teaching classrooms provide increased opportunities for both teaching and learning that would not occur in a single teacher classroom.

Co-teaching candidates apprentice alongside practitioners so they can learn what to do in a given situation based on the master teachers' years of practice and maturity within the profession (Roth & Boyd, 1999; Clarke et al., 2000)). While teacher candidates are still working on synthesizing thinking (reflection) and acting, in co-teaching they are able to watch a master teacher think and act simultaneously over an extended period of time. The teacher candidate learns the difference between being present and having a presence in the classroom (Roth, Masciotra & Boyd, 1999).

Co-teaching also helps the cooperating teacher to develop enhanced communication and collaboration skills through as they reflect on their own practice to provide answers to their teacher candidate. Weiss and Lloyd (2003) note that in order for co-teaching to be successful, there must be proper training in instructional models and ongoing professional development in communication skills, collaboration and instructional strategies as well as administrative support. They also recommend that for co-teaching to work it is important that both parties see the model as voluntary and are willing to undertake the steps necessary to ensure success.

In terms of student achievement, Boyd et al. (2009) show that teacher preparation that engages in more actual practice of what happens in the day-to-day classroom have greater gains in student achievement. In a co-teaching model, veteran teachers introduce teacher candidates as co-teachers and expect them to be active in the class from the first day. By contrast, a traditional

model has preservice students observe for several weeks with a gradual takeover of duties. This approach may not result in teaching a full schedule until almost half way through the student teaching experience, often delaying or limiting the “legitimacy” that a student teacher feels about entry to the profession (Cuenca, 2011) and their ability to contribute positively to student learning.

Bacharach, Heck, and Dahlberg (2010) conducted a study of student achievement scores in ELA and math and found that P-12 students who were taught in a co-teaching model “...statistically outperformed their peers in classrooms taught by either a single teacher or a cooperating teacher and a teacher candidate using a non-co-teaching model of student teaching” (p.12). Factors such as reduction in class ratio so students get more individualized attention, the ability to more effectively differentiate learning, less transition time, fewer behavior issues, and the exposure to multiple teaching styles all contribute to an enhanced learning environment that is just not possible with only one teacher in the room. This is especially noticeable in classrooms with high numbers of inclusion students (special ed/original co-teaching cite needed here?).

Another advantage of co-teaching is the ability for the teacher candidate and the cooperating teacher to learn andragogy as well as pedagogy (Knowles, 1980). Teacher certification programs do not often teach adult learning theory, though master teachers who accept a teacher candidate are expected to coach these neophyte educators through an intensive clinical apprenticeship. When co-teaching, both the lead teacher and teacher candidate are expected to be able to direct the adults in the room as they assume the lead on planning and teaching, making andragogical skills a necessity (Hammerness & Darling-Hammond, 2002; LaBoskey & Richert, 2002).

Kentucky has adopted co-teaching as the student teaching model statewide, and one of the differences they point to is the expectation that teacher candidates are expected to work alongside cooperating teachers as peers and not as student teachers (Willis, 2013). In the Kentucky study, unexpected side effects of co-teaching included the connections between co-teaching and the CCSS. Cooperating teachers believed that they were more likely to achieve the standards using the co-teaching model because of the ability to differentiate. One teacher noted, “By co-teaching we can optimize student learning and double the teaching” (p.37).

Cooperating teachers often express concern about the lack of training they receive for evaluating their teacher candidates. As a result, cooperating teachers are unable to realize the full benefits of the experience (Clarke, Triggs, & Nielsen, 2013). Instead, they provide feedback on the technical aspects of teaching and focus more on what to do rather than how or why to do so. Cooperating teachers have the crucial role of introducing the hidden dimensions of teaching to teacher candidates, which begins with establishing a mentoring relationship.

In a well-planned co-teaching model, teacher candidates and cooperating teachers are required to undertake a mandatory training outside of the classroom. During this experience, teaching teams get to know each other and learn together what comprises co-teaching as they develop a common definition and view of how co-teaching will look in their classroom. Clarke, Triggs, and Nelson (2013), note that it is imperative that cooperating teachers receive training and are able to grow in their own practice. EPPs rely on cooperating teachers to be mentors and provide a quality classroom experience for teacher candidates. However, EPPs also have both an opportunity and a responsibility to engage, support and gain feedback from cooperating teachers to help improve teacher education programs and the profession for all stakeholders.

The Study at Richard Stockton College

The Richard Stockton College of New Jersey (Stockton) is a four-year state college with an enrollment of approximately 8,500 students, many of whom live in the southern New Jersey region. Enrollment for the college is approximately 60% female and 74% white. Within the college, the liberal arts schools that offer undergraduate degrees in content area majors partner with the School of Education (SOE), which offers classes leading to certification, or an option to earn a dual or post-baccalaureate degree in education. Stockton's program requires three clinical experiences, beginning with two consecutive 80-hour placements for the introductory and intermediate semesters, paired with methods courses at the college. A third and final semester of fieldwork is the student teaching experience, which is 14 weeks of full time teaching five days a week, and serves as the capstone of the certification sequence. Researchers at the college initially designed the pilot study as a voluntary choice between two models for hosting a teacher candidate: co-teaching or a traditional takeover model of student teaching. The goal of the pilot study is to identify differences between the two models to inform future research.

As a condition of participating, those cooperating teachers who choose the co-teaching model must report for an initial training about co-teaching with their teacher candidate. After the training, cooperating teachers have the option of taking an additional 3-credit Coaching and Mentoring graduate level course, tuition-free. By contrast, in a traditional take over model, the teacher of record is not required to participate in initial training, essentially handing over the classroom completely and retreating to the background as an observer.

This pilot study takes place in the Stockton teacher preparation program during the spring 2014 semester and includes the P-12 schools hosting teacher candidates during their final clinical

experience, student teaching. The districts are located in six counties throughout southern and central New Jersey and vary in size, socioeconomic status, and demographics.

Participants

This study began with 47 student teachers in the total population. Fifteen teams consisting of a teacher candidate and a cooperating teacher self-selected to participate in the initial training in co-teaching, comprising the experimental group. Of that group, nine cooperating teachers enrolled in the graduate-level Coaching and Mentoring Class for ongoing support throughout the experience. The experimental group therefore contains 9 cooperating teachers who received ongoing support and 6 cooperating teachers who received only the initial training to prepare for the pilot study. The remaining 32 teacher candidates-cooperating teacher pairs form the control group that used the traditional take-over model of student teaching and received no training.

Measures

We used several instruments to measure student teaching effectiveness during this pilot.

1. Survey of student teachers: completed at the end of student teaching, this assessment asks student to self-report on their preparedness to run a classroom of their own based in part on their experiences with the cooperating teacher.
2. Supervisor observations of student teachers: trained college supervisors complete six formative and two summative instruments based on the Danielson Framework during the student teaching experience. All supervisors must participating in a pre-semester norming session before they use the instrument.
3. Cooperating teacher observations of student teachers: Like the supervisor observations, the cooperating teacher observations are based on the Danielson

Framework. Cooperating teachers conduct four formative evaluations and a summative midterm and final to show progress throughout the experience

For those students with cooperating teachers involved in the Coaching and Mentoring class, additional student learning data were collected including:

4. On the elementary level, reading levels as determined by the district reading system, such as Fountas and Pinnell: These assessments are given at least three times a year at each school. Similarly, we collected elementary level benchmark math scores determined by district curriculum. We converted actual scores from dissimilar systems and curricula on a three-point scale to code student achievement levels as -1 = below grade level, 1 = at grade level, and 2 = above grade level. These measures help to isolate the growth during the period when the student teacher was present.
5. On the middle and high school level, we collected teacher grade book data to convert actual scores in the student teacher's target subject (biology, language arts, math, social studies, etc.) to the same 3-point scale, relative to grade-level.

Design

Given the non-randomized self-selection into groups of disproportionate sizes, we designed the pilot study specifically for the purpose of identifying elements that will be needed for a larger scale future implementation of the co-teaching model at Stockton. For example, although we held an initial meeting for the 15 experimental group members, it was only among the 9 wherein we directed both the cooperating teachers and the candidates to collect pre- and post- student achievement data. Therefore, the results of the pilot are limited to looking at

learning gains for this sub-group of nine only. In a follow-up study, we will require that all participants collect student achievement data.

To complement the survey and ratings data, our pilot study design also includes qualitative participant reflections, specifically, statements from the cooperating teachers in the experimental group who have previously hosted a traditional take-over model student teacher. We use these to identify additional future design enhancements, like obtaining an experience survey on preparation for hosting a student teacher from all cooperating teachers in both groups.

Research Questions

1. What similarities and differences do the experimental and control groups report in their survey responses and evaluation rubrics?
2. What are the learning gains within the co-teaching group?
3. What themes recur among narrative comments from the co-teaching mentors?

Results

Our findings include both similarities and differences between the groups, with some differences that support earlier studies of co-teaching. Specifically, self-reported satisfaction levels among co-teaching pairs were higher than among their traditional counterparts. In addition, we found evidence that nearly every co-teaching class saw K-12 student learning gains of varying magnitudes. And finally, the narrative comments of co-teaching mentors who took the graduate course traced three themes that connect integrally with current accountability reforms.

Similarities and Differences between Groups

We measured similarities and differences from candidate self-reports on an exit survey, from cooperating teacher Danielson-based evaluation rubrics of candidates, and from supervisor Danielson-based evaluation rubrics. Tables 1-3 show results of the exit survey section where

students rate their level of preparedness for the New Jersey Professional Standards on a scale of 1-4 (lowest to highest):

Table 1

Overall Average of Candidate Preparedness for New Jersey Professional Standards

Candidates' Survey Items NJ Professional Standards	N	Average of Candidates' Self-Reported Level of Preparedness (1-4)
Co-Teaching	15	3.54
Traditional	32	3.55

These aggregate results look very similar, which is not surprising because all teacher candidates completed the same training prior to student teaching. However, when we examined the six individual items more closely, we found similarities between the two groups in Table 2, and differences in Table 3:

Table 2

Similarities among Candidate Preparedness for New Jersey Professional Standards

Candidates' Survey Items NJ Professional Standards	N	Use effective verbal and nonverbal techniques that foster individual and collective inquiry	Learn through professional development organizations, literature and materials	Actively participate in collegial activities within the school's learning community
Co-Teaching	15	3.60	3.47	3.47
Traditional	32	3.59	3.44	3.53

In both the experimental group who received co-teaching training and the control group who used the traditional take-over model, self-reported feelings of preparedness for three of the six New Jersey Professional Standards for Teachers were statistically similar. In all three items, candidates reported no differences between their preparedness.

Table 3

Differences among Candidate Preparedness for New Jersey Professional Standards

Candidates' Survey Items NJ Professional Standards	N	Communicate in a variety of ways that demonstrate a sensitivity to cultural, linguistic, gender and social differences	Conduct continuous self-assessment and development to enhance professional growth	Use reflective practices for continuous self-improvement
Co-Teaching	15	3.47	3.67	3.60
Traditional	32	3.56	3.47	3.69

Although the differences in perceived levels of preparedness were slight, the co-teaching pairs reported a significant difference in their readiness to conduct continuous self-assessment and development to enhance their own professional growth. This difference may be attributable to the ongoing co-planning, co-teaching and co-assessment that their training emphasized.

In the survey section where students rated their experiences with cooperating teachers, the experimental co-teaching pairs reported moderately higher satisfaction levels than their counterparts:

Table 4

Overall Average of Candidates' Experiences of Cooperating Teachers

Candidates' Survey Items Cooperating Teacher	N	Average of Candidates' Self-Reported Experience of Coop (1-4)
Co-Teaching	15	3.81
Traditional	32	3.63

And as before, teacher candidates in both groups rated their cooperating teachers similarly on some factors, such as feedback, differentiating and developing a collegial relationship.

Table 5

Experiences of Cooperating Teachers Similarities

Candidates' Survey Items Cooperating Teacher	N	Gave feedback on daily lesson plans and instruction	Helped me analyze a lesson to ensure a good match for student's needs and environment	Accepted me as a professional colleague
Co-Teaching	15	3.73	3.67	3.87
Traditional	32	3.75	3.50	3.81

Table 6 illustrates the strongest significant differences perceived between the experimental and the control groups, including the “gradual” guidance and the “own style” experiences.

Table 6

Differences between Experiences of Cooperating Teachers

Candidates' Survey Items Cooperating Teacher	N	Provided me an orientation to the school, the classroom, the students and available resources	Guided me into my teaching responsibilities gradually	Demonstrated various teaching strategies, techniques, forms of assessment and management practices	Encouraged me to develop my own teaching style
Co-Teaching	15	3.87	3.87	3.80	3.87
Traditional	32	3.63	3.66	3.53	3.56

In addition to the candidates’ survey, we also examined similarities and differences on the college supervisors’ evaluations of candidates’ teaching, using a Danielson-based observation

protocol. Prior to the start of each semester, college supervisors receive training on the instrument, and participate in a norming exercise to increase inter-rater reliability. The observation protocol use a 1-3 scale (Danielson level 4 is deemed beyond expectations of a novice teacher candidate). As before, Table 7 illustrates overall averages; Tables 8 and 9 depict similarities and differences.

Table 7

Overall Average of Supervisor Final Observations

College Supervisors Danielson Ratings of Candidates	N	Overall Average Score Supervisor Danielson Framework
Co-Teaching	15	2.18
Traditional	32	2.16

Overall, the supervisors rated candidates very similarly on the 21 components of teaching performance comprising the Danielson Framework. During the pilot study, several supervisors observed both, an experimental co-teaching pair and a traditional take-over model pair. Tables 8-1 through 8-4 summarize the many areas of similarity by each of the four domains in the Framework.

Table 8-1

Similarities of Supervisor Final Observations Domain 1

College Supervisors Danielson Ratings	N	1a. Knowledge of content & pedagogy	1b. Knowledge of students	1c. Selecting instructional outcomes	1e. Designing coherent instruction	1f. Designing student assessments
Co-Teaching	15	2.20	2.07	2.13	2.27	2.00
Traditional	32	2.13	2.16	2.16	2.19	2.06

Table 8-2

Similarities of Supervisor Final Observations Domain 2

College Supervisors Danielson Ratings of Candidates	N	2b. Establishing a culture for learning	2c. Managing classroom procedures	2d. Managing student behavior
Co-Teaching	15	2.13	2.20	2.07
Traditional	32	2.19	2.16	2.13

Table 8-3

Similarities of Supervisor Final Observations Domain 3

College Supervisors Danielson Ratings of Candidates	N	3a. Communicating with students	3c. Engaging students in learning	3d. Using assessment in instruction	3e. Demonstrating flexibility and responsiveness
Co-Teaching	15	2.13	2.27	2.00	2.20
Traditional	32	2.19	2.19	2.06	2.19

Table 8-4

Similarities of Supervisor Final Observations Domain 4

College Supervisors Danielson Ratings of Candidates	N	4a. Reflecting on teaching	4b. Maintaining accurate records	4c. Communicating with families	4d. Participating in a professional community	4e. Growing and Developing Professionally
Co-Teaching	15	2.20	2.13	1.87	2.33	2.27
Traditional	32	2.25	2.17	1.96	2.16	2.19

Overall, the college supervisors rated the candidates in both groups as statistically similar on the majority of the 21 components in the Danielson Framework. Supervisors did, however, rate the experimental co-teachers differently than their traditional counterpart in some of the components. Table 9 depicts those differences for all four domains.

Table 9

Differences between Supervisor Final Observations Domains 1-4

College Supervisors Danielson Ratings of Candidates	N	1d. Demonstrating knowledge of resources	2a. Creating an environment of respect and rapport	2e. Organizing physical space	3b. Questioning and discussion techniques	4f Showing Professionalism
Co-Teaching	15	2.27	2.47	2.13	2.27	2.47
Traditional	32	2.13	2.34	2.29	2.09	2.13

Among the differences, the most significant that supervisors rated differently is in Domain 4: showing professionalism. Overall, by the final evaluation at the end of the student teaching term, supervisors observed stronger professional behaviors among the experimental co-teaching pairs than they saw among the traditional control group. These behaviors include integrity and ethical conduct, service to students, advocacy, decision-making, and the candidates' compliance with school and district regulations. This difference may be linked to the candidates' rating their co-teaching cooperating partners higher at feeling better oriented to the school, its regulations and to the students than their counterparts in the control group.

Like the supervisors, cooperating teachers use a "teacher-friendly" version of the Danielson Framework to rate the performance of their candidates. However, because cooperating teachers rate only one candidate per term, they have not been required to participate in inter-rater reliability exercises. In addition, only the cooperating teachers who opted to participate in the experimental group received explicit training and ongoing support in using the instrument. Cooperating teachers in the control group received explanatory email messages and instructions displayed on the instrument itself for selecting 1-3 ratings that best described the levels they observed.

Table 10

Overall Average of Cooperating Teachers Final Observations

Cooperating Teachers Danielson Ratings of Candidates	N	Overall Average Score Cooperating Teacher Danielson Framework
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Co-Teaching	15	2.84
Traditional	32	2.87

In keeping with the overall similarities that supervisors reported on average, the cooperating teachers reported very similar aggregate results between the two groups in the pilot study. In fact, the cooperating teachers reported statistically similar observations for all but five components across all four domains. The differences between those five components were also smaller than those reported by the supervisors. It is possible that these small differences shown in Table 11 may be attributed to the relatively low amount of training and experience for all cooperating teachers when compared to supervisors. However, the cooperating teachers in the experimental group did report a stronger rating of their candidates' participation in a professional community than did their traditional counterparts.

Table 11

Small Differences between Cooperating Teachers Final Observations

Cooperating Teachers Danielson Ratings of Candidates	N	1b Demonstrating knowledge of students	2e. Organizing physical space	3c. Engaging students in learning	4b. Maintaining accurate records	4d. Participating in a professional community
Co-Teaching	15	2.71	2.13	2.27	2.13	2.33
Traditional	32	2.84	2.29	2.19	2.17	2.16

In addition to the student surveys and Danielson-based performance observation results, we also required the experimental co-teachers who opted into the graduate course to collect pre- and post-student teacher achievement data from the K-12 students in their classes. As we await the New Jersey Department of Education's ability to share standardized performance data with our preparation program, we developed a local method for converting disparate subject areas to a 3-

point scale, relative to grade level expectations. Table 12 summarizes the student population for each experimental co-teaching pair:

Table 12

Student Population

Grade Level	K-12 Student Population				# Students N
	SpecEd	Basic Skills	I &RS		
K	2	7	2		31
1	3	9	5		23
1	6	3	2		22
2	10	3	3		25
3	1	8	3		17
7	9	0	5		91
7	7	12	4		52
11	19	0	0		106
9, 10, 12	18	0	1		83

Using the grade-level scale we developed to align dissimilar grading systems and curricular titles, Table 12-2 presents the student achievement pre-test results of the experimental co-teaching pairs. The Pre-test Results scale allocates a -1 for each student performing below grade level, a 1 for each student scoring at grade level, and a 2 for each student performing above grade level. We recognize the limitation in this scale, not accounting for degrees of difference above or below grade level (-2, +3, etc.) However, some participants did not keep similar degrees of precision, which will become a clearer directive in a future study design. To determine each Prescore, we multiplied the number of students Below grade level by -1, added that sum to the number of At grade level students, and added that sum to the number of Above grade level students multiplied by 2:

Table 13

Student Achievement Pre-test Results among Co-Teaching Pairs

Pre-test Results						
Grade Level	N	Below	At Grade	Above	Prescore	
K	31	27	4	0	-23	
1	23	16	4	4	-4	
1	22	1	5	11	26	
2	25	13	7	0	-6	
3	17	10	0	7	4	
7	91	18	43	27	79	
7	52	57	0	0	-57	
11	106	15	5	25	40	
9, 10, 12	83	15	26	42	95	

In all of the co-teaching pairs for this sub-group who collected scores, students were distributed in varying numbers below, at, or above grade levels. Similar to the pre-scores, at the end of the student teaching semester, the post-scores also varied, showing improvements from modest to significant in all but one case among the sub-group of co-teachers who participated in the graduate course.

Table 14

Student Achievement Post-test Results among Co-Teaching Pairs

Post-test Results							
Grade Level	N	Below	At Level	Above	Postscore	Gains	
K	31	17	6	8	5	28	
1	23	9	7	8	14	18	
1	22	1	0	16	31	5	
2	25	5	10	4	13	19	
3	17	0	0	17	34	30	
7	91	3	35	53	138	59	
7	52	28	15	11	9	66	
11	106	2	1	42	83	43	
9, 10, 12	83	22	29	32	71	-24	

Gains that ranged from 5 to 66 points on our internally-constructed scale hold promise for the design of future studies that will investigate the impact of co-teaching on student achievement as compared to the traditional model. The single co-teaching pair that saw a decrease in student performance was in secondary mathematics. Although there was a general decrease among all three grades in his schedule, the cooperating teacher noted that other than the exception of two students with extreme decreases, the majority of grades remained within a +/- 5 point range of the previous marking period grade while 30% of the total *N* increased their scores by more than 5 points. In particular, the decline in scores that occurs among the senior calculus students is typical of winter-early spring results among that population, according to narrative reflections by the cooperating teacher who claims, "...the student's grades did generally stay the same."

A Word from the Cooperating Teachers

The nine teachers in our Coaching and Mentoring course attended both on-campus meetings and hosted off-campus site visits by the researchers. Throughout the course, the cooperating teachers completed assignments including reflective journals, data analysis of student achievement, and the development of a coaching and mentoring plan. Four of the nine cooperating teachers had never hosted a preservice candidate before but had hosted preservice candidates for observation levels of clinical experience. When the group of nine gathered for class and began to share experiences, they expanded upon several of the topics that began to emerge during the site visits to individual classrooms in group discussions and captured in course assignments. Of the 16 topics identified, three themes recur in the narrative comments.

The first of the themes focused on administrative responsibilities. In this era of accountability, documentation and data analysis are important parts of a successful classroom,

but often there is not enough time for those tasks, forcing the tradeoff between teaching and other tasks. With a co-teaching model, six out of nine cooperating teachers cited the sharing of administrative responsibilities as one of the unexpected benefits of co-teaching. One teacher notes, “So much more time was used teaching versus doing paperwork because there were two of us. Our schedule was designed to maximize teaching time.” Since both members of the co-teaching team work together to analyze data, they get through it faster and are able to provide timely feedback to the students. One teacher attributes her increase in student achievement to this idea, “With two teachers in the room, we were able to conference weekly with each student to make sure they were on task and going to meet their goals with success.”

The ability to maximize time was another topic that appeared often. Whether it was the ability to move through transitions seamlessly, the knowledge that if one or the other of the co-teaching team were absent the lesson would continue as planned, or when students who returned from an absence could be quickly caught up without having to stop the class, co-teaching teams reported an increase in instructional time.

A second theme was connecting with students. The reduced staff-to-student ratio in a co-teaching classroom allowed teachers to connect with their students on a much deeper level. All nine teachers wrote about having the time to connect with students. This was also evident during the site visits where the researcher observed students receiving individual attention without disruption while the rest of the class continued with the lesson. One high school teacher stated,

“Co-teaching provided a better student: teacher ratio that resulted in increased student achievement. Students received more individualized attention which resulted in a higher level of skill and comprehension of materials.”

One cooperating teacher attributed increased student participation and engagement among their students to the seven co-teaching lesson design models the teams received training in; six cited

more opportunity to help struggling students, four claimed they now had the time to differentiate instruction, and five noted the decrease in behavioral problems because of the increased student engagement. A middle school teacher explained,

“Having two teachers in the room allowed one teacher to address inappropriate student behavior immediately without much attention drawn to the student or his/her attempt to disrupt others. In addition to handling student behaviors due to disruptive students, another teacher allows those students who would otherwise be frustrated a second person to help make sense of difficult material. This ultimately helped to eliminate those disruptive behaviors that occur in an attempt to avoid doing work. “

A third theme was the reflection and growth of the cooperating teachers. All nine of the cooperating teachers cited their own growth as positive result of working in the co-teaching model. Seven teachers claimed that they were re-energized as they gained new perspectives on content from their teacher candidates. The cooperating teachers' growth also stemmed from learning about new methodology and technology from their teacher candidates. A kindergarten teacher wrote of her teacher candidate, “She is also very well versed with technology so she taught me many new ways to use and integrate technology in the classroom.” Group discussions also brought out that the cooperating teachers were much more reflective in their own practice and developed better collaboration and communication skills because they had to explain to their teacher candidates that which was implicit about their own practice. A first grade teacher who hosted five traditional student teachers in the past wrote of her co-teaching teacher candidate, “Our daily dialogue alone helped me open my eyes to new ideas.” A third grade teacher shared, “Co-planning also taught me how to really share responsibility for student learning.” Finally, several cooperating teachers commented on the benefits of the Coaching and Mentoring class. None of the cooperating teachers ever had a forum to compare cooperating teacher experiences and help each other problem solve. One high school teacher noted the impact of the class was,

“...hugely beneficial to adjusting expectations” while a first grade teacher wrote, “I was very reflective to begin with but now I think about both student learners and adult learners.”

Discussion

Teacher preparation lays the foundation on which great teaching is built. The cornerstone of that foundation is the student teaching experience. Traditionally, cooperating teachers are expected to turn over their classroom for a designated period so a student teacher can practice teaching. The term cooperating teacher comes from the idea that classroom practitioners were expected to cooperate with college faculty, hand over their classrooms, and get out of the way (Clarke et al., 2013). Primarily, the teacher candidate reaped the benefits of student teaching, but it can be argued that even teacher candidates did not gain much benefit because they were overwhelmed, provided little guidance, and did not always have a model of what good practice looked like. This type of training fostered survival skills rather than a deepening of practice, and is a contributing factor to a school culture that is resistant to collaboration. In the current era of education reform and accountability, this model is no longer effective.

Across the state, teacher preparation programs in New Jersey struggled to place student teachers in local districts as new evaluation models were implemented. In order to persuade school districts to host one of our candidates, we hoped to show that hosting a student teacher would not be detrimental to student achievement scores. After some preliminary research, we introduced co-teaching as a model that could benefit the cooperating teacher, K-12 students, and student teacher. Students receive more individualized attention, resulting in higher student achievement scores, cooperating teachers get to develop their communication and collaboration skills while also maintaining some control over their classrooms, and student teachers gain experience teaching alongside master teachers as they learn to direct both students and adults in teaching and learning.

Preliminary results from this study provide us with initial indications that the co-teaching model may have significant impact on some aspects of candidate preparedness to teach, satisfaction with the cooperating teacher, and on teaching performance. In the small group we analyzed for student achievement, an overwhelming number of the pairs saw gains that ranged in size from small to large. These preliminary findings support earlier work cited in the literature review, and provide the basis for refining the instruments and design for a larger-scale study. An important limitation of the student achievement data is that the posttest results were gathered in April at the end of the student teaching experience. Those students who were already performing at or above grade level had already reached the year-end achievement benchmarks for the year and still had over two months of school to complete.

Stockton's free graduate level course in coaching and mentoring is a unique feature of the pilot. Beyond the initial training of the cooperating teacher, teacher candidate, and supervisor on the co-teaching model, the course provided the opportunity for the cooperating teachers to gain valuable skills, to network with each other, and provide the School of Education with valuable practitioner insight on how to improve the program. Cooperating teachers gained coaching and mentoring skills and developed a supervisor perspective when it came to evaluating their teacher candidates. The co-teaching model as well as the professional development offered in the Coaching and Mentoring class has appealed to districts and strengthened district partnerships. We now have several districts that will only accept student teachers in a co-teaching model and reject candidates from other preparation programs that do not provide training for the cooperating teacher.

The implications for the program on student teaching should be viewed from a holistic standpoint. With current research showing that 40% of new teachers leave within the first five

years (Ingersoll & Merrill, 2013), we must rethink what it takes to be a successful teacher. Our analysis showed that co-teacher candidates rated much higher on showing professionalism than their traditional model peers. Our co-teacher candidates also believed that their mentors provided more guidance and encouraged them to find their own teaching identity. Both merit further study.

A follow-up study design is already underway. As noted previously, this pilot identified a need to administer baseline training to the cooperating teachers on the Danielson-based instrument. Another is to develop a survey that asks cooperating teachers to rate their experiences in the teaching and mentoring activities included in both models. Similarly, future participants in both groups will be directed to collect pre- and post- student teaching grade level student distributions, as we continue to await the State of New Jersey's developing capacity to deliver standardized achievement data. The college is also considering a pilot use an instrument that asks K-12 students to rate their perceptions of student teacher candidate performance.

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