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Transforming Our Practice: Coteaching, Coplacement, Collaboration

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Abstract
Elementary and special education faculty describe the transformation of their practice and share their collaborative coplacement model for preparing teachers who work together to ensure the academic success of all children.

> School personnel are graduates of our colleges and universities. It is there that they learn there are at least two types of human beings, and if you choose to work with one of them, you render yourself legally and conceptually incompetent to work with others. (Sarason, 1982, p. 258)

Nearly 30 years after Sarason made this observation, teacher preparation programs are still partly to blame for the separation of competence. What would it be like if teacher education modeled a truly inclusive form of educational practice? What if teacher education programs helped future teachers to become comfortable and competent with diversity and complexity through a preparation model that encouraged them to merge their areas of expertise?

We are colleagues at a medium-size institution with a 100-year history of teacher preparation. In 2007 two special education and three elementary education faculty members in our institution piloted a collaborative preparation model in which we placed our elementary and special education interns together in the same elementary classrooms with the directive that they coplan and coteach. We have since refined our efforts with support from a personnel preparation grant (Project MERGE) from the U.S. Department of Education, Office of Special Education Programs. In this article we support our position in favor of an integrated teacher education program. We describe our "flying-the-plane-while-building-it" approach to collaborative teacher preparation practices. We end with a reflection on the research that must occur regarding the complex process of transformation in our own program and on questions that suggest further studies.

A Continuum of Collaboration in Teacher Education

Over the last two decades universities across the country have tried various means of preparing students for collaborative teaching. Their efforts have ranged from entirely unified teacher preparation programs to dual certification programs that produce students certified in both special and elementary or secondary education (Blanton, Griffin, Winn, & Pugach, 1997). In spite of this rich sampling of unified and merged programs, most colleges and universities have not rushed to duplicate these models. Furthermore, in spite of tremendous advances in the availability of special education and support programs and services, struggling students and students with identified disabilities have continued to demonstrate low levels of achievement, to experience school failure, and to drop out of school without graduating. These ongoing failures call into question the character and quality of instruction provided these students by both special and general educators (Winn & Blanton, 2005).

The profession is now in the midst of renewed discussions on the need for collaboration in teacher education (Blanton & Pugach, 2007). Why now? We have a legal imperative through No Child Left Behind (NCLB) and the Individuals with Disabilities Education Act (IDEA) to prepare teachers to enter the field with

the expectation that most students with disabilities can and will learn rigorous, standards-based, general education curriculum as well as the competencies needed to facilitate those students' access and success. What are the problems we must overcome? There is a dearth of required special education coursework for teacher candidates preparing to be general educators. Lack of alignment between state teacher education policies and the needs of classroom teachers working with diverse student populations remains a thorny problem. Separate standards of accreditation and licensure requirements for general and special educators are a major challenge as well. Some in the field have called for a "thoughtful review of teacher preparation standards and programs" (Thompson, Lazarus, Clapper, & Thurlow, 2006, p. 145) in light of the need for all teachers to serve all students, including those with disabilities.

Blanton and Pugach (2007) presented a continuum which provides a framework for considering the different ways teacher education programs can respond to the imperative of preparing teacher candidates for collaboration. While *discrete programs* maintaining separate general and special education teacher education programs occupy one end of the continuum, fully *merged programs* offering dual licensure in both general and special education reside on the opposite end. In the center of the continuum, teacher education programs vary in degree of integration of general and special education. In *integrated programs* licensure in general and special education remains separate. General and special education preparation areas maintain separate features unique to each, but faculty collaboration and teacher candidate collaboration is emphasized.

The Evolution of Collaborative Teacher Preparation at Our University

During the 2005-2006 academic year, the two separate departments of educational studies (comprising programs in elementary, middle, and secondary education; educational leadership; educational foundations; and reading) and special education (comprising high-incidence disabilities—now special education, general curriculum k-12; deaf education; and early childhood education/early childhood special education) merged

into a single School of Teacher Education and Leadership. One of the goals of this merger was to build upon collaborations that were already occurring among faculty. A preliminary, informal study of cross-departmental collaborations revealed that a number of efforts were underway. Faculty teaching students in the secondary education program were meeting monthly. The group included faculty in social studies, English, and science education, reading (now literacy education), and special education. Several faculty members had pioneered coteaching arrangements between reading and special education and science and special education.

Faculty from special education and elementary education also began talking about ways to work together. Elementary teacher candidates and special education candidates were already being placed in a local school district known for full inclusion. Their experiences often highlighted the disconnect between their preparation in our programs and the skills they needed to collaborate with others in inclusive settings. We needed to combine our expertise to assist future teachers in developing those skills. We saw the opportunity to effect grassroots change by preparing our teacher candidates to meet the needs of all students through collaboration with other education professionals.

In their AACTE *White Paper Preparing Teachers to Work with Students with Disabilities: Possibilities and Challenges for Special and General Teacher Education,* Kosleski, Pugach, and Yinger (2002) offered five areas of recommendations. The one that resonated most deeply with us, and the one we could enact most immediately, was the recommendation to establish collaborative clinical experiences for prospective general and special educators. The authors urged collaborative mentoring and coaching of preservice teachers, joint seminars, shared supervision and mentoring, development of collaborative partnerships, and the selection and development of practice settings that engender a shared sense of responsibility for the learning of all students. We chose coteaching as our primary collaborative strategy.

During the spring of 2007 we piloted our collaborative teaching model. We coplaced and cosupervised 14 special education teaching interns with 14 elementary education student teachers. The special education interns were in their fourth year,

second semester, of a five-year program leading to the M.S. in Special Education. The elementary education student teachers were in the final semester of their senior year in a traditional four-year baccalaureate program. These partners participated in monthly joint seminars and coplanned and cotaught instructional lessons together. Most also had the opportunity to participate in at least one collaborative post observation conference with their cooperating classroom teacher, both teacher candidates, and the special education and elementary education university supervisors.

We embarked on a multi-year study in which we made changes to the program based on our ongoing observations and research. For example, results of a survey of special education alumni who had been among the first coplaced interns highlighted the need for coplaced candidates to be at an equivalent place in their respective programs. With the support of our School's director, we were able to switch the coplacement semester to the fall. Students in each coplaced pair now had equivalent training in lesson planning and were in the field experience phase of their programs.

By the 2010-2011 academic year we had two cohorts of coplaced elementary education-special education interns, who were cotaught and cosupervised by two elementary education-special education faculty pairs. Members of each cohort were placed in the same school and in the same weekly internship seminar.

Our Most Significant Challenges

One of the greatest challenges to the coteaching partnership was perception of the established structure of the general education classroom. Many elementary teacher candidates held entrenched notions of classroom teacher authority and had to abandon their vision of "I am *the* teacher" to adjust to sharing the "stage" with a special education colleague.

We taught and encouraged direct, small-group instruction as a means for effectively reaching the needs of diverse learners and as a way to try out the various coteaching models for shared instruction. However, the classrooms in which many of the

partners were coplaced were structured for more traditional, whole-group instruction. Coplanning could still occur but coteaching went much less smoothly in these classrooms.

Although we were working in a school district that had been committed to inclusive education since 1991, we found a need to revisit and redefine collaboration with our partnership schools. We were encouraging our student teachers and interns to coplan and coteach, but few saw it modeled between their general education cooperating teachers and the special educators serving the students in their classrooms.

Our Advantages and Successes

As we noted earlier, this pilot project was a grassroots effort that stemmed from already existing positive relationships among colleagues. Because it was not an attempt at a major program redesign requiring the cooperation and collaboration of all teacher education faculty, we did not have to work past the resistance that other programs have faced. On the contrary, excitement about our collaboration proved to be contagious. After a presentation of our project at a School of Teacher Education and Leadership faculty meeting, several faculty members in the middle and secondary programs came to us to discuss options for collaboration with special education.

We created a collaborative community of practice for ourselves. We approached our work and research within the safety of a small professional learning community, where we did not profess to have all the answers and were willing to learn alongside our teacher candidates. By merging our expertise, we experienced mutual professional development.

Where Are We Now?

In the 2011-2012 academic year, we have implemented significant contextual and structural changes to our coteaching cohort design; these changes are making our candidates' experiences more cohesive. This year, we decided to include in our two coteaching cohorts only elementary education candidates whose two interdisciplinary studies concentrations include special education and one academic area. We made this decision with the

agreement of elementary program faculty who would be assigned the remaining elementary candidates, who have completed both concentrations in academic content areas (English, math, science, or social science). We made this choice because our special education candidates and elementary special education concentrators have shared knowledge based on the special education courses they all have taken. These courses address topics related to creating positive classroom environments for all children. Our intention is to build on and extend that common knowledge in the coteaching cohorts' weekly seminars.

Another important adjustment that we made this year was to enroll both groups of candidates, elementary and special education, in the same coursework. At last, the coteaching pairs have the same classes, schedules, and assignments. This change completes our goal of creating a learning community model wherein all coteaching cohort students are immersed in studying and practicing the same body of knowledge and pedagogies in coursework and fieldwork. Many of the coursework assignments are fieldwork applications, such as unit or lesson plans; our coplaced pairs now hold equal status in their planning roles for all lessons, not just the lessons they are required to coteach.

These contextual changes have brought benefits for our coplaced pairs. Common assignments foster equal dialogue about planning and student needs. We have noticed more comments from coteaching partners related to learning from and depending on each other as coteachers and about viewing each other as equal partners. This year's elementary candidates are not questioning the need for our special education candidates to have teaching time with the whole class; they no longer expect them to teach only an individual child at the back of the room. The pairs demonstrate "give and take" regarding who will take the lead in the various roles they assume throughout the day. Although a few of our cooperating teachers have opted out of mentoring two candidates at a time, the cooperating teachers who welcome coplaced pairs consistently comment on the value of the way pairs are learning together.

We are maintaining and developing coteaching approaches in our supervisory and teaching capacities. We have developed tools to manage a sign-up system for weekly observations and/or conferences with each candidate. Because of the difficulties of

scheduling observations, we have started using digital video technology to view recorded lessons. The supervisor and candidates view a recorded lesson together and use an observation form to document reflection and feedback on the successes and challenges in the lesson. Coteaching faculty members in each cohort meet weekly to coplan and coteach the weekly seminar, to discuss candidates' progress or concerns, and to address issues of cross checking for grading assignments. This year we have altered seminar topics to complement and extend our candidates' background knowledge on creating positive classroom environments.

As evidence of the larger curriculum transformation that is also occurring in the School, the entire elementary education program faculty team decided to revise the lesson plan template used across the program's coursework to include a new component based on Universal Design for Learning (Council for Exceptional Children, 2005) that promotes inclusive lessons. As the elementary faculty coteaching team members shared this revised template with the special education faculty team members, we realized that we could easily merge the components of our coteaching lesson plan into the new elementary lesson plan template to create one lesson plan that includes all the required components. Now we have one elementary lesson plan template that includes both UDL components and a section to denote how coteaching approaches will be used. Placing the coteaching approaches section on our general education lesson plan serves to make coteaching approaches a possibility for every teacher, every lesson. Merging the two lesson plans is a simple example of how we were able to remove an existing "difference" between our programs.

Ripple effects from all of our efforts are emerging in the schools. We have more elementary candidates than special education candidates, and therefore some of the interns are not coplaced. As these candidates have also been required to create coteaching lesson plans with a peer, their cooperating teacher or even a graduate intern in special education, the language and applications of coteaching are becoming more widely used. We now include coteaching language in our conversations and make a point to label the coteaching approaches that we see occurring in classrooms. For example, we might say, "Oh, I noticed that you

(cooperating teacher) and Ms. Brown (student intern) have been using the one-teach, one-assist coteaching approach. Do you think that Ms. Brown is ready to try the station teaching model?" Because we work in schools where coteaching models for station and alternate teaching are used when teacher-specialists come to classrooms for literacy instruction, transferring teachers' positive experiences with multiple adults in the classroom has been mostly smooth. Adding the language of coteaching helps us to emphasize the relevance of co-teaching throughout the day.

Program Evaluation Activities and Planned Research

We began *without* a long-term vision for how we could accomplish our goals but *with* a passionate belief that we must find ways to prepare general and special education teachers to collaborate so as to "facilitate the success of diverse learners" (Winn & Blanton, 2005, p. 2). The elementary program had a history of commitment to an infused multicultural teacher education curriculum, and the special education faculty had contributed to state and national efforts in inclusive practices. However, we had never worked together for the common purpose of preparing teacher candidates to teach diverse learners.

Despite trepidations, we proceeded and agreed it would be important to study our process from the very beginning. We formed a research team and early in January 2007 began meeting biweekly to plan both our work and our research. Our research team began with two simple premises:

- We knew that we could learn from one another. We wanted our teacher candidates to "acquire a common conceptual framework, language, and set of technical skills with which to communicate" (Villa, Thousand, & Chapple, 1996, p. 42); we also needed to do the same as university faculty. We had operated in separate academic spheres that used different research references, a different language, and a different frame of reference for instructional design.
- We knew that our interns and student teachers could learn from one another. Special education interns had completed coursework in strategies for students with high-incidence disabilities, and elementary student teachers were in the process of learning about and enacting best-practice

curriculum design and literacy instruction. They could learn from one another and develop "common frameworks from which to view curriculum and instruction" (Winn & Blanton, 2005, p. 3).

Across the past five years, we have engaged in a number of program evaluation activities that have guided the development of the collaborative model and the process of continuous program change and improvement. These include a small qualitative study of our first-year pilot, alumni surveys, self-assessments of collaboration by faculty members of the Project MERGE Integrated Teacher Education Team, feedback from annual focus group meetings with our elementary partnership schools, and feedback from twice-yearly meetings of the Project MERGE Special Education Advisory Council.

Qualitative Study of Our Pilot

In the first year of our pilot, we conducted a small qualitative study. Our goal was to learn more about the strengths and challenges of collaborative teaching at the pre-service level. We interviewed teacher candidates at the beginning and the end of the collaborative semester. We also held focus group sessions for the advisory boards at each school, and all classroom teachers hosting collaborative partners were invited to attend. Additional data sources were the lesson plans developed and implemented by coplaced interns and field notes from formal observations written by faculty supervisors.

What we learned.

We began the semester with the belief that the merging of expertise, ours and that of our students, would unfold in exciting ways, and it did, but numerous challenges presented themselves as well. Preliminary analysis of student and teacher interviews revealed that our teacher candidate participants were identifying the very same factors often cited as critical for successful coteaching by experienced practitioners (Arguelles, Hughes, & Schumm, 2000):

- common planning time—we learned about the problems that occurred when it couldn't be worked out;
- personal flexibility, which includes sharing space, being open to new strategies and changes in scheduling, and adaptability when things don't go right;
- having the courage to be a risk-taker and seeking support and encouragement for trying new things;
- defining roles and responsibilities for each adult in the class across the school day and accepting new roles and responsibilities;
- compatibility between partners—those with significant personality differences experienced the most difficulty;
- communication skills—those who engaged in honest, open, and thoughtful dialogue perceived the least difficulty with the coteaching placement.

Alumni Surveys and Special Education Advisory Council

As a Project MERGE initiative, we gathered data on the effectiveness of our five-year program in special education through the use of special education alumni surveys. Two alumni surveys were conducted, in spring 2009 and spring 2010, and a third survey will be conducted in fall 2011. One of the survey questions specifically addresses the perceived benefit of collaborative placements: *If you were in a collaborative placement with an elementary education intern during your early field experience, please provide feedback on how the experience benefited you and what suggestions you have for improvement.*

Project MERGE formed an Advisory Council and invited K-12 special and general education teachers, administrators, parents, and alumni to meet with us twice a year. Through focus group discussions across two years, we gathered 27 recommendations to improve our school partnerships and our special education teacher preparation program in the following areas: Communication and Listening; Preparation of Interns, What Schools Can do to Improve Field Experience; and Professional Development.

As a result of feedback from alumni and from the Advisory Council, we made a number of significant changes to the program. The chart below illustrates how we used this feedback to make program changes in just one area:

Alumni Input	Advisory Council Input	Program Response
Candidates need more experience in collaborating and communicating with families.	Interns need to know the importance of establishing early, positive relationships with families.	Requirements added to internship and communicated to cooperating teachers: more attendance at IEP and behavior meetings, parent/teacher conferences. Family communication project added to elementary early field experience.

Self-assessment of Faculty Collaboration

In 2005, when the School of Teacher Education and Leadership was moving toward unification, we conducted an initial survey of collaboration. A survey was sent via email to the 32 active faculty members of the school. There were a total of 18 responses. For each category of cooperative/collaborative activity, we asked respondents to include the following information: names of faculty members/staff and their program areas (as well as departments and/or colleges, for those whose work extended beyond teacher education); description of collaborative activity and dates; information about persons served/benefiting from the activity. Questions reflected the following topics: cooperative planning activities to deliver instruction to enrolled teacher preparation/educational leadership students; coteaching or shared activities to deliver instruction to enrolled teacher preparation/educational leadership students; cooperative evaluation or supervision of students; cooperative planning and/or provision of service for workshops, special courses, and conference presentations/activities to practitioners and

colleagues; and cooperative/collaborative research, inquiry, grant, or marketing activities. The results revealed a great desire for collaboration on the part of many faculty and a variety of collaborative activities occurring, but most collaborative activities were one-time or short-term in nature.

In spring 2009, Project MERGE conducted another self-assessment of faculty collaboration using the *Higher Education Self-Assessment: Preparing General and Special Education Teachers of Students Who Have Disabilities* (Blanton & Pugach, 2007). The survey was completed by 15 of the 21 members of the Integrated Teacher Education Team, an advisory group to Project MERGE. The results of this survey showed faculty collaboration and curriculum coherence at the developing stage; depth of shared knowledge, alignment of performance assessments, administrative structures, and collaborative pk-12 partnerships were at the entry level for collaboration.

Where Do We Go from Here?

We learned from multiple reviews of the literature that many collaborative teacher preparation programs have chosen to focus on dual licensure for their candidates with the goal of developing professionals with the same set of skills who can meet the needs of all students. As we studied across our first two years of collaborative teacher preparation, we came to the realization that we did not share that goal. We do believe that all teachers need a set of common skills and knowledge, and we are working toward creating shared, collaboratively developed courses that all teacher preparation students, regardless of program area, will take together. However, we have come to believe that meeting the needs of all children will be better served by maintaining the separate professional identities of general educator and special educator, and we have chosen to work toward becoming a well-integrated, collaborative teacher education program with distinct areas of licensure for our graduates.

In her response to the program transformation at University of Florida, Blanton (2005) noted that there is a scarcity of literature documenting and conducting inquiry into the intensive work of reform and transformation in teacher education programs, especially collaborative efforts across preparation programs in

special and general education. Brownell, Ross, Colo'n, and McCallum (2004) also noted that there has been little research investigating the experiences of faculty and students in those programs.

We agree. We are planning research that will provide insight into the complexity of the process of teacher learning and teacher development in a collaborative teacher education model.
What will guide our research agenda? Pugach and Blanton (2009) have proposed a matrix that provides a common language and cohesive approach to studying collaborative teacher education. The matrix represents three program types (discrete, integrated, and merged) and five program variables (curricular coherence, faculty collaboration, depth of knowledge, performance/portfolio assessments, and pk-12 partnerships). We will begin with a study of collaboration in our integrated program but expand the depth of focus to include both faculty collaboration and candidate collaboration.

Our qualitative research study questions will be built around the postulates posed by Griffin and Pugach (1997).

1. Collaboration
    a. Faculty collaboration—What has the process of collaboration looked like? What were the catalysts? What are the collaborative relationships that have had the most impact on the program?
    b. Candidate collaboration—What has the process of collaboration looked like for coplaced candidates? What has been the impact of collaboration for the coplaced teacher preparation candidates within their placements and post graduation?
2. What mechanisms were created and used for communication and dialogue that facilitated collaboration?
3. How have our school partnerships played a role in the development of our collaborative model?
4. What elements of leadership have supported collaboration?
5. What was the nature of resistance within the department and what did we do to identify and move past resistance?
6. What was the nature of the confrontations that occurred within the collaborative relationships regarding different ideas and practices about teaching and learning, and how did we handle those?

It will also be important for us to document how our collaborative program has promoted teacher effectiveness. Brownell, Griffin, Leko and Stephens (2011) noted that one important component of teacher effectiveness for us to investigate is the knowledge and skills set needed for effective collaborative teaching and interaction. Given that our program is built on the premise that the merging of expertise is essential, we will be identifying the intersection of the skills sets of the special education candidates and the elementary education candidates (Brownell, Ross, Colón & McCallum, 2003).

Proposed Methodology.

The data collection for this study will be based on the work of Hammerness (2006), who studied the development of coherence in the Stanford Teacher Education Program through a comprehensive process of document and artifact review, interviews, and observations. Methods that we will use include:

- review of materials and learning activities and structures adopted or developed by the collaborative teacher education model, as well as departmental documents, including grant reports and minutes of faculty meetings and retreats;
- observation of candidates' coplanned and cotaught lessons;
- transcription of audiotapes of supervisor/candidate conferences after cotaught lessons;
- collection of collaborative lesson plans for coplanned and cotaught lessons;
- evaluation of candidate collaboration skills using items from the *Magiera-Simmons Quality Indicator Model of Co-Teaching (2005)* and Friend's *Co-Teach!* Handbook (2009);
- analysis of pre and post test data and formative student assessments from student subgroups for coplanned and cotaught social studies and science units (fall and spring of internship year);
- interviews with elementary and special education alumni who were coplaced interns (protocol to be developed);
- observations of elementary and special education alumni who were coplaced interns (protocol to be developed);

- interviews with program faculty members and administration;
- readministration of the *Higher Education Self-Assessment: Preparing General and Special Education Teachers of Students Who Have Disabilities* (Blanton & Pugach, 2007) with distribution of the survey to all department members and Integrated Teacher Education Team members.

Through this study we hope to tease out what is working and how it is working and to provide evidence that our program produces teacher candidates who know how to coplan and coteach, who do so effectively, and who have a positive impact on the academic success of students with disabilities.

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Exploring Connections Between Science Teacher Learning and Designing Quality Professional Development

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Abstract
This study examined teacher learning during a yearlong science academy based on an improvement process design for professional development. An explanatory research methodology revealed statistically significant gains for teachers in two of the three physical science topics. A qualitative phase explored why there were learning gains for some topics and not others.

A critical need exists for well-prepared, confident educators who thrive to remain fresh and committed to their profession in order to effect systemic change (Nieto, 2009). For meaningful change to occur, teacher learning requires high-quality, sustainable professional development (PD) that presents teachers with opportunities not only to learn, but also to practice and master what they have been taught (Guskey, 2000). Furthermore, teachers can reflect on who they are as professional educators, learn content in new ways, think about their own learning, and acquire insights into how students learn (Cohen & Hill, 2001; Garet, Porter, Desimone, Birman, & Yoon, 2001; Saxe, Gearhart, & Nasir, 2001; Snow-Renner & Lauer, 2005; Supovitz, Mayer, & Kahle, 2000; Weiss, Pasley, Smith, Banilower, & Heck, 2003).

Given the numerous, diverse perspectives on what makes PD meaningful for science teachers, we believe that the core of any effective science PD consists of improving teacher content knowledge along with providing opportunities to broaden participants' teaching repertoire (Ball, 2000; Darling-Hammond & Richardson, 2009; Loucks-Horsely, Stiles, Mundry, Love, & Hewson, 2010). Relying on the assumption that teachers best understand what they need to learn in order to improve their instruction, we developed a yearlong science academy utilizing an improvement process design for PD based on science topics suggested by participating teachers.

The improvement process design rests on three key assumptions: 1) teachers learn best when they have a need or a vested interest in solving a problem, whether it be related to instruction or curriculum, 2) teachers know best how to identify their needs, and 3) teachers can learn effectively through collaboration, given that the group shares a common need (Loucks-Horsley, et al., 2010). The science academy wanted to achieve two goals: 1) to expand teachers' science content knowledge and 2) to determine the degree to which the teachers applied what they learned about science teaching and learning in their classrooms. We sought to identify the extent to which selected physical science topics were learned by the participants and their ability to teach these topics in their classrooms.

This study investigated the relationship between teacher science learning during the academy and the degree to which teachers applied their content knowledge in their classrooms. In the initial quantitative phase of the study, pre/post-tests identified changes in participants' science content knowledge. There were significant gains for some topics, specifically, waves and pressure. However, the pre/post-tests results for force and motion showed minimal participant learning. We followed up the quantitative phase with a qualitative phase involving classroom observations because a key question remained unanswered -- Why were there gains in teacher science learning for some topics taught and not others?

Theoretical Framework

Improvement Process Design for professional development

Using an improvement process design for professional development, participants assisted in building the academy's science curriculum. Before the academy began, teachers identified key physical science topics to be included. They based their choices on their own needs for improving their classroom science instruction, and, subsequently, improving student learning outcomes. The researchers listened to teachers, developed a science curriculum, and established an environment that encouraged teachers to reason collectively and share their ideas of how their own learning would impact the teaching and the learning of their students.

Addressing the core of science instruction, the academy developed a modeling-based curriculum that focused on selected science topics along with complimentary mathematics topics. Modeling was selected as a basis for the curriculum because it afforded teachers opportunities to "re-think" content knowledge, thereby, influencing their own learning and understanding (Ball, 2000; Supovitz & Turner, 2000; Weiss et al., 2003). The improvement process design rested on the premise that modeling, a major theme in both science and mathematics, is an important element of inquiry-based approaches to instruction.

Modeling in science and mathematics

For authentic modeling activities to be successful in the classroom, a solid theoretical foundation is needed which encompasses the idea that scientific and mathematical representations, discourse, argumentation, and negotiation and validation of models are important (Lehrer & Schauble, 2000; 2002). These ideas related to inquiry have implications for both science and mathematics teaching and learning in terms of scientific knowledge being developed. Constructing mathematical models within the social setting of a classroom is critical to learning and understanding physical science topics that were selected by the participants.

A well-accepted definition of scientific modeling is a testable idea created individually or collaboratively that tells a story or helps provide an explanation about something that happens in nature. Modeling suggests how things work or might work (Rutherford & Ahlgren, 1990; Bailer-Jones, 1999). In practice, scientific models may include a mathematized description of phenomena. A scientific model becomes a mathematical model if the model represents a real-world situation involving mathematical concepts and tools.

Three types of models were presented during the yearlong academy; these models included: the physical, mathematical, and mental or conceptual. By using a modeling-based curriculum, teachers had opportunities to predict how certain scientific phenomena occur or behave while under observation. They could, for example, examine the powerful ideas that support pictorial and physical models of wave action and apply them to their understanding of how students learn. The rationale for embedding modeling in the PD academy curriculum was to enhance learning through scientific inquiry.

Participants

The PD academy enrolled twenty elementary and middle school teachers from several school districts located along the Texas-Mexico border. Through the academy, teachers received 183 hours of professional development over the course of one year. Participants initially attended a three-week, daylong summer component followed by full day, monthly meetings held during the fall and spring semesters. By interacting with participants over an eighteen-month period, researchers had opportunities to dialogue with them about teaching and learning science beyond a single PD session.

Curriculum and Delivery System

The curriculum focused on selected physical science topics, which included pressure, waves, and force and motion (kinematics) along with related mathematics topics (see Table 1).

Physical science content	*Related Mathematics content*
Pressure	Volume; Area
Waves	Ratio (frequency and period)
Force & Motion	Graphing; Linear and non-linear relationships; Ratio

Table 1 *Modeling curriculum featuring science and related mathematics content*

The 5E pedagogy, which includes five instructional phases: engage, explore, explain, elaborate, and evaluate, served as the instructional sequence to deliver the modeling-based curriculum. Our 5E pedagogy is a modified version of Bybee's 5Es (1997) in which the "elaborate" phase provides learners with opportunities to form relationships between ideas and/or variables in an experimental context. This relationship using scientific and mathematical constructs promotes learner inquiry and reflection, which becomes the focus of an experimental study. Table 2 identifies the 5Es phases along with a description of learner behavior relevant to that phase.

5E Phases	*Description of Each Phase*
Engage	Students encounter or identify the phenomenon. They make connections between past and present learning experiences. They ask questions and identify the situation or problem.
Explore	Students interact with materials and resources and rely on these experience(s) to guide their exploration. They observe situations, collect data, and begin to analyze results.
Explain	Based on student experiences and data collected during the explore phase, the teacher introduces the appropriate academic language associated with the experiences. The teacher guides the students in developing and learning science and related mathematics topics, making connections between inscriptions, representations, and hands-on experiences, and provides a learning environment for understanding the difference between facts and concepts.
Elaborate	Students build relationships between variables identified during an experiment. Students use models (scientific and mathematical) to make connections between ideas and theories. Students also become aware of connections between their ideas and other ideas or concepts (sometimes involving correlation and/or causality).
Evaluate	Students are assessed in various ways about what they have learned. They are assessed on fundamental skills, academic language, science and related math topics, and interpretations of visual representations and graphics.

Table 2 *Modified version of Bybee's 5E pedagogy delivery system for the modeling-based curriculum indicating student behaviors for each phase*

The modeling-based curriculum was designed to teach selected physical science topics less from a coverage perspective and more from a depth perspective. For example, the science topics of force and motion were complemented with the inclusion of measurement, estimation, functions, and graphing. Table 3 presents one component of the curriculum focusing on the study of motion aligned with the mathematics content along with the 5E pedagogy.

5E Phases	*Science Content*	*Related Mathematics Content*
Engage	In what way(s) does this film clip show the character is moving at a constant speed?	In what way(s) does this film clip show the character is moving at a constant speed?
Explore	Rolling a ball to measure distance and the time required for the ball to reach a certain distance from the starting point	Organizing data (creating charts and graphs) to record information from observations
Explain	What is meant by distance, time, speed, velocity, and acceleration?	Building tables and studying sequences and patterns (as well as defining these terms)
Elaborate	What is the relationship between distance and time of a moving object?	Mathematical modeling: Graphing distance vs. time (coordinate axes) and making interpretations based on measure and slope of lines; learning ratios and constructing equivalent ratios
Evaluate	Participating in the vocabulary "loop" (an oral exercise where students must read aloud and listen attentively to each word and definition to respond to the questions)	Include mathematical definitions including those developed by students that were not originally identified during "explain" (e.g. "slope", "axis")

Table 3 *One component of the curriculum that focused on uniform motion and constructing a model*

As von Glasersfeld (2000) notes, "It is not sufficient for teachers to be familiar with the subject matter of the curriculum. They also have to have a repertoire of didactic situations in which the concepts that are to be built up can be involved" (p. 200). It is this view of teacher knowledge that helped support the use of modeling as a foundation for evoking teacher learning in science and its relationship with mathematics, and the participants' willingness to implement such a curriculum in their classrooms.

Method

We used a two-phase explanatory mixed methods design to collect and analyze quantitative and qualitative data. Quantitative data were collected from administered pre-/post-teacher assessments focusing on pressure, waves, and force and motion. All assessments contained questions requiring calculations as well as short answer responses. A parametric *t*-distribution, two-tailed, non-directional statistical protocol was used to increase the power of the quantitative analysis.

Qualitative data were collected from videotaped classroom observations of all participants, A grounded theory analysis (Charmaz, 2006) of the observation data involved three types of incident-to-incident coding: 1) initial coding (identifying actions and interactions between teachers and students), 2) focused coding (using selected initial codes to revisit data -- a constant-comparison approach that defined initial categories and described patterns of interactions), and 3) theoretical coding (relying on theoretical sensitivity to stimulate reflection of the data and determine attributes of initial categories, thereby constructing theoretical or core categories).

Results

Quantitative phase

To assess the effectiveness of the modeling-based curriculum implemented during the yearlong PD academy, teachers completed pre-/post-tests that focused on selected physical science topics. Table 4 identifies each test and the specific topics addressed.

Quantitative Assessments	***Topics measured***
Pressure	Operational and formal definitions; Relationships between variables: pressure, temperature, and volume; Applications; Types of pressure: varying and atmospheric
Waves	Types of waves: longitudinal, transverse, period, amplitude, and frequency
Force and motion	Newton's laws; Relationships between distance, rate, and time; Uniform and non-uniform motion; Velocity and acceleration

Table 4 *Tests with topics measured*

A comparison between teachers' pre-test and post-test scores found that their understanding of some topics was enhanced through participation in the yearlong science academy. There were score improvements between pre-/post-tests in two science topics assessed. On the pressure test, pre-/post-score comparisons revealed a 30.6% average increase [$t(30) = 6.854$, $p < .001$]. For the waves test, pre-/post-score comparisons revealed, on average, a 35.2% increase [$t(39) = 12.950$, $p < .001$]. Furthermore, the waves test showed the largest pre-/post-test score increase of 45.3%. Based on these results, we concluded that the teacher learning related to pressure and waves had increased. The results,

however, from the force and motion pre-/post-tests failed the significance tests. Overall, teachers scored a mere average of 6.5 questions correct out of 12. Teacher responses from the force and motion test along with researcher interpretations are presented in Table 5.

Selected force and motion questions	*Results*	*Interpretations*
"Create a Journey": Given a position-time graph of a puppy moving back and forth in front of a motion sensor, identify points or regions on a graph that correlate to given motion situations (e.g. where the puppy is moving more slowly to the left, etc.).	A mean of 2.16 correct out of 7 provided motion situations	Develop the concept of motion based on qualitative reasoning (qualitative calculus) (Stroup, 2002))
A ball moving at 30 m/s has a momentum of 15 kg m/s. Determine the mass of the ball.	Only 9 teachers answered correctly	Develop the concept of rate based on ratio and proportion Develop representational competency to compare ratios
"Toy Car Speed": Given a table showing times on four separate trials for a toy car to travel 10 meters across an identical section of floor, provide a possible reason why it took longer on some trials than others (change in friction, air resistance, change in mass, applying a constant force).	All teachers answered "applying a constant force" rather than "change in mass"	Investigate and develop the concept of force as it relates to motion (Hestenes, Wells, & Swackhamer, 1992)

Table 5 *Results from force and motion assessment*

We followed up the quantitative phase with a qualitative phase to explore possible reasons for why there was improvement in teacher science learning for some topics taught and not others. To investigate this anomaly, we conducted classroom observations. The goal was to gain greater insight into how participants were teaching force and motion and how they were using modeling activities to present these topics.

Qualitative phase

Analysis of observation notes and videotapes provided additional data regarding teacher learning of force and motion. The classroom analysis phase of the study afforded a snapshot of the quality and level of effectiveness of the professional development. Table 6 outlines three initial categories revealed through the focused coding: 1) measuring, 2) qualifying, and 3) experimenting. The results from the three types of coding are presented in this section. Attributes of each initial category are also provided.

Initial categories	***Attributes with applicable initial codes***
Measuring	*"Counting"* - Attempting to find a final measure by using discrete units or by using "chunks" of units
	"Estimating" - Discussing how to accept over- and under-estimates of distance and time
Quantifying	*"Rate"* - Attempting to quantify the speed of the object in motion. An attempt to see a precise mathematical relationship between distance and time
Experimenting	*"Physical"* - Students examined or "played with" concrete objects that are part of an activity
	"Directing"- Teachers provided (only) directions, procedural information, and/or definitions to student questions regarding the activity
	"Student talk" - Students attempted to connect ideas by questioning the teacher or a fellow student ("Does my conclusion make sense?"; "Is this the same as that?"; What do you mean ___ relates to ___?")

Table 6 *Established initial categories and their attributes*

In the next qualitative phase of study, focused codes based on the initial codes and, later, through constant-comparison methods, developed theoretical categories. These categories and their attributes are presented in Table 7.

Theoretical categories	***Attributes***
"Good Enough"	Showing evidence of immersing themselves in the experiments/activities and taking part in discussions about error and what may or may not be "good enough" when making simple measurements.
"Accumulation"	Teachers were inclined to reason about co-variation from a standpoint of "accumulation" (Stroup, 2005), e.g., How much more over time? How much more is added? How much further?
"Modeling was 'doing with guided instruction'"	Teachers believed that they needed a "time for telling." They needed to tell students, who were manipulating an object or conducting an experiment, "what to do."

Table 7 *Major theoretical categories and their attributes*

Over the course of our analysis, the theoretical categories, based on our interactions with the participants, made possible the construction of a plausible theory or interpretation of events to investigate the relationship between what participants learned during the academy and their ability to teach what they learned. Analysis of observation data revealed that teachers needed a better grasp of mathematics topics related to force and motion including measurement, estimation, and ratio reasoning and more experience in implementing modeling activities as indicated by the final theoretical category.

Discussion

The improvement process design of the science academy was fundamental in providing high quality and sustainable professional development.The academy included two significant components: 1) the improvement process professional development design and 2) a curriculum which was modeling-based and which aligned complementary mathematics topics to augment the teaching and learning of key physical science topics. Our current study allowed us to put forth the conjecture that to improve science teacher learning and practice, professional development needs to focus on specific science content while integrating specific instructional strategies. These strategies are first experienced by participants in a safe, non-threatening environment and then mastered as they return to their own classrooms. For in-depth science understanding to take place, aligning specific content knowledge and specific pedagogical strategies through a modeling-based curriculum is crucial.

In our research, participants in the academy enhanced their knowledge in two of the three physical science topics based on statistically significant increases. A question that perplexed us was, Why were there minimal gains on the assessment for force and motion? From observing and analyzing classroom observation notes and videotapes, it was evident the teachers used models and the modeling process when teaching pressure and waves, but these were absent when teaching force and motion. Rather, they relied more on textbook-based instruction than hands-on experiences when they taught these topics. We posited that the difference in their teaching could be traced to their negligible knowledge of the mathematics related to force and motion. Further, teachers were not firmly grounded in how to use models or implement the modeling process when teaching these topics.

Secondly, science content knowledge along with related mathematics content and pedagogical knowledge of modeling are interdependent and are critical to expanding teachers' learning and understanding of science phenomena. By contextualizing mathematics content within a science PD, teaching goes beyond learning "… specific vocabulary at the expense of seeking understanding of the underlying scientific principles" (p. 1,

Gerber, Marek, & Martin, 2011). The goal of planning and teaching science becomes one of developing problem solving and general thinking skills.

The qualitative and quantitative results reinforce the need for teachers to be strongly grounded in both content and pedagogy (Bybee & Van Scotter, 2006). The improvement process PD design presented a major obstacle in identifying teacher content weaknesses and shortcomings not only in science, but also in mathematics. Despite the fact that the academy included a "feedback loop," teachers and researchers viewed the science and mathematics of measurement and estimation competencies very differently. Teachers' typically viewed measurement and estimation as de-contextualized skills, believing that mathematics is an "exact" discipline. They believed that the domain of mathematics does not allow for "error." Holding such beliefs prohibits learners from understanding the importance of measurement and estimation as proficiencies, which are key to learning many science topics, specifically force and motion. The researchers found that making the connections between science and aligned mathematics content is fundamental to teacher learning. We conjecture that modeling promotes measurement and estimation understanding by making possible the connection between physical science content and certain mathematical constructs (Carrejo & Marshall, 2007; Marshall & Carrejo, 2008). For pressure and waves this connection seem to have been made by the participants, but the connection between force and motion and related mathematics remained weak.

We discovered, after viewing classroom episodes, that teachers, while presenting the topics of force and motion, struggled with student questions related to measure, estimation, and rate. They either did not appreciate the importance of the connection between science and mathematics or they totally ignored it. Consequently, teachers were not able to support their students' reasoning through the modeling process. For many of the teachers, modeling-based instruction simply became "direct instruction," relying on traditional, step-by-step exercises. As a result, force and motion topics were covered in participants' classrooms, but not to the degree that their students gained conceptual understanding of either topic.

Conclusion

Traditional PD designs for science may not be as effective in helping teachers improve their practice because there is often a disconnect between what is learned and what is then implemented in classrooms. Kazemi and Hubbard (2008) argue that teacher learning is an evolutionary process; it is first supported by professional development and continually supported by what is learned in classrooms from students. For effective science instruction to evolve, professional development must be grounded in theory, address pedagogical strategies that work, utilize best practices, and support active participation of teachers.

The improvement process design guided the modeling-based curriculum of the science academy by using pedagogical strategies and integrating mathematics content. These design elements proved significant on pre/post test measures for pressure and waves. Most importantly, the evolutionary process of improving teacher instructional effectiveness in science was evident in their classrooms based on observed teaching episodes. Teachers in the yearlong science academy had opportunities to examine and explore numerous modeling pedagogical strategies and ways to integrate complementary mathematics topics. In short, they took what they learned in the PD academy and implemented it successfully in their classrooms. When the pre/post test measures for force and motion indicated a lack of teacher learning, classroom observations provided evidence to successfully answer the "why" question. We recognized that there was a lack of mathematics content knowledge and of modeling-based strategies to support a robust understanding force and motion in their classrooms.

We concur with Kazemi and Hubbard (2008) that for professional development programs to be effective in enhancing teacher learning, such learning has to evolve. Teachers have to demonstrate their knowledge of specific content and strategies, take what they have learned, and then implement this new learning in their classrooms. This cycle of teacher learning needs to be foremost in the design of quality professional development.

The PD design, the nature of the curriculum, the strategies selected, and the mechanisms for measuring effectiveness need to

be guided by sound research. Testing teachers during the academy provided one dimension of their learning, but the observations provided another. It will take both to ensure that professional development is effective and completes the cycle of teacher learning leading to academic success of all students. In summary, the design of professional development should be built upon precepts that "teaching and learning are interdependent, not separate functions" (Lieberman & Miller, 1990, p. 112).

Our road to designing quality science professional development has been complex and exigent. This study has provided opportunities for informing our own knowledge about science teacher learning. Fundamental to our ongoing research and to offering sustainable professional development in science has been to uncover information that sheds light on answering the following questions: What type of professional development is needed? What should teachers learn and come to understand while participating in PD?, and, most importantly, How do teachers learn science and related mathematics content? Our research thus far has uncovered some answers to each of these questions, but more still needs to be done.

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Investigating Student Teacher Outcomes of a Clinical Faculty Program

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Abstract
Twenty-five years ago, the Commonwealth of Virginia established the designation of clinical faculty to describe experienced in-service teachers who hold adjunct faculty status by virtue of their selection, training, and expertise in contributing to the preparation of new teachers in university-based education programs. This study investigated whether clinical faculty training is correlated with differences in the mid-term and final performance evaluations of student teachers in two groups: those mentored by trained clinical faculty and those mentored by untrained cooperating teachers. Findings suggest that clinical faculty training is associated with more effective assessment and feedback practices by clinical faculty, as well as with stronger overall performances of student teachers. Implications for building the capacity of untrained cooperating teachers through the culture created within partnership schools are also explored.

Investigating Student Teacher Outcomes of a Clinical Faculty Program

Twenty-five years ago, the General Assembly of the Commonwealth of Virginia enacted an innovative initiative in the arena of teacher preparation when it passed House Bill No. 1085. This legislation formally and broadly established a new role among teacher educators in the state's approved teacher

preparation programs. This new role was that of a *clinical faculty member*, which became codified as a "licensed public or private school teacher" who has been "specially trained" *(Code of Virginia*, § 22.1-290.1, ¶ 2 and 5) to supervise and evaluate student teachers. By virtue of a clinical faculty member's experience, training, and role in the teacher preparation program of an accredited higher education institution, he or she was to be granted adjunct faculty status by the respective institution for which he or she served this role.

During the decade that followed this legislation, the Virginia Department of Education (VDOE), the State Council for Higher Education in Virginia (SCHEV), and a number of local school divisions and institutes of higher education undertook various pilot programs with the intent of enacting clinical faculty programs to support aspiring and novice teachers (VDOE, 2000). Then, fully 10 years after passage of House Bill No. 1085, the General Assembly appropriated funds for the 1998-2000 biennium to support competitive grants to establish clinical faculty programs as partnerships between institutes of higher education and local school divisions. Twenty such programs were funded during this first grant cycle. Also at this time, the Virginia Department of Education (2000) published *Guidelines for Mentor Teacher Programs for Beginning and Experienced Teachers*, which established parity in concept, purpose, and structure between the supervision and evaluation of aspiring teachers in teacher preparation programs and the mentoring of novice teachers in public school divisions. The definition of "Clinical Faculty" in the *Guidelines* is indicative of this synonymic conceptualization of pre-service supervision and novice mentoring:

> **Clinical Faculty** [bold in original] means experienced teachers who have served successfully as cooperating teachers, meet selection criteria established by the college or university, and receive the consistent, extensive training in supervisory skills in order to be designated clinical faculty by a college or university; usually given special status (adjunct) by college or university and have increased involvement in the preparation of new teachers. (Mentor and clinical faculty training may be combined giving classroom teachers the opportunity to assist either student teachers or new teachers.) (p. 20)

In short, the advent of the "clinical faculty" designation by the Commonwealth of Virginia 25 years ago and the ensuing decade of enactment of clinical faculty models eventually resulted in the establishment of a common definition, a set of guidelines, and a stream of funding (albeit competitively based) for the development of clinical faculty programs in teacher preparation institutions across the state.

Training Cooperating Teachers

As conceptualized in the Commonwealth of Virginia and as applied to teacher preparation, the clinical faculty model is premised on two fundamental assumptions. First, it clearly values the role of field experiences in the preparation of new teachers. Teaching is an applied profession; therefore, the preparation of teachers has always been dependent upon the authentic practice, development, refinement, and mastery of essential skills in clinical settings, namely K-12 schools. However, valuing the role of clinical experiences in teacher preparation is not new. Indeed, the normal schools movement in the United States established field-based practice in lab or "model" schools more than a century ago (Lampert, 2010). On the cusp of the present century, a policy review of educational research argued that the evidence supporting the important role of field experiences in teacher preparation was inarguable (Darling-Hammond, 2000). Even in today's contentious political climate, there remains clear consensus that clinical experiences are critical to the effective preparation of new teachers (National Council for the Accreditation of Teacher Education [NCATE], 2010; National Council for Teacher Quality [NCTQ], 2011). Thus, the creation of the clinical faculty designation in Virginia a quarter century ago represents an affirmation by the Commonwealth that in-service teachers in partnering K-12 schools—commonly referred to as *cooperating teachers*—must play a role in the preparation of new teachers.

The second assumption upon which Virginia's clinical faculty designation is premised is the importance of *training* cooperating teachers for the role of supervising and evaluating teacher candidates in field experiences. As stated in the *Guidelines for Mentoring Programs*, clinical faculty should "receive the

consistent, extensive training in supervisory skills" (VDOE, 2000, p. 20) necessary to effectively support teacher candidates in field experiences.

The idea that cooperating teachers should receive training to fulfill their role of supervising teacher candidates is not entirely new. Boatright, Phelps and Schmitz (1986) found that training cooperating teachers helps improve observation techniques and helps reduce the halo effect in evaluating student teachers. Other investigations have found that trained cooperating teachers were more likely than their untrained peers to provide evaluative comments, had significantly more interaction with their student teachers in planning and preparation, were better able to engage in the clinical supervision process, and were more likely to be nonjudgmental in their feedback, thus focusing on helping student teachers to reflect on and analyze their own teaching (Bryant & Currin, 1995; Kent, 2001; Killian & McIntyre, 1987; Koster, Korthagen, & Wubbels, 1998). On the other hand, *untrained* cooperating teachers may be *less likely* to fail a student teacher who does not meet expectations of performance (Clarke, 2001). Additionally, a recent study of the effectiveness of first-year teachers in terms of student achievement found that student gains were greater in classrooms in which a new teacher's preparation had been in a program with close oversight of the student teaching experience (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2008).

Despite these findings, cooperating teachers still are not typically required to have specific training to serve in the role. Levin (2002) alludes to the illogic of this phenomenon, noting that clinical experiences are vital to teacher preparation yet are perhaps the least intentional component of the process. Darling-Hammond (2006) posits, "Often, the clinical side of teacher education has been fairly haphazard, depending on the idiosyncrasies of loosely selected placements with little guidance about what happens in them and little connection to university work" (p. 308). More recently, Zeichner (2010) characterized clinical experiences as historically being "unguided and disconnected" (p. 91), noting that student teachers typically are not provided substantive support from cooperating teachers. Thus, despite evidence that training cooperating teachers can make differences for teacher candidates, the practice is not the

norm in teacher preparation in the United States. Sykes, Bird, and Kennedy (2011) summarize the point: "If we speak of the need for 'effective' or 'capable' teachers to serve as mentors, such phrasing misses the complications that that teacher might be effective in teaching their students yet not possess skills and dispositions to be effective mentors for novice" (p. 475). In other words, effectiveness as a classroom teacher is not enough to serve as an effective cooperating teacher. Cooperating teachers must be effective mentors, too. Furthermore, for most cooperating teachers, the knowledge, skills, and dispositions of effective mentoring must be learned.

Clinical Faculty Training in Virginia

The statutory establishment of the *clinical faculty* designation in Virginia built upon the two assumptions previously described: (1) that clinical experiences supervised by experienced classroom teachers are essential to the effective preparation of new teachers and (2) that experienced teachers who are fulfilling the role as cooperating teachers must be trained. Thus, in articulating the *Guidelines for Mentor Teacher Programs for Beginning and Experienced Teachers*, the Commonwealth clearly identified the construct of mentoring as the skill set central to the clinical faculty role (VDOE, 2000).

Similar to teaching, mentoring is an applied craft. Mentoring must be enacted, and the effect of the act of mentoring must ultimately be manifested in the actions exhibited by the mentee (Trubowitz, 2004). Furthermore, mentoring in a profession fundamentally relies on three elements: (1) the mentor's own depth of knowledge, skills, and experiences in the profession, (2) the mentor's ability to identify accurately the potential in a mentee, and (3) the mentor's ability to enable a mentee to achieve that potential. In teacher preparation, a cooperating teacher should serve as a mentor to a teacher candidate; therefore, a base of craft-skill and experience is essential for the cooperating teacher. However, a cooperating teacher should also possess knowledge and skills related to characteristics of adult learners, stages of teacher development, professional standards of teacher competency, program design, classroom observation techniques, coaching strategies, and the like. But experience as a classroom

teacher is likely *not* adequate in and of itself to acquire such knowledge or to develop such skills. Thus, the aim of the clinical faculty initiative in Virginia is to identify, recruit, select, train, and support master classroom teachers as mentors to pre-service teachers in the Commonwealth's approved teacher preparation programs (VDOE, 2000). With this common aim, state-approved teacher preparation programs have been enabled to partner with local school divisions and to craft unique models for their respective clinical faculty programs. One model is the William & Mary (W&M) Clinical Faculty Program, which was launched in 1998.

The mission of the W&M Clinical Faculty Program is:

> To work through on-going collaboration and professional development among School of Education faculty and exemplary cooperating teachers in order to improve the practica and student teaching experiences of aspiring teachers and the first-year experiences of novice teachers in K-12 school settings so that the most highly qualified teachers enter, remain in, and contribute to the profession, thereby resulting in improved student learning.

The program is aligned with the state's *Guidelines* in its mission, as well as in its dependence upon specific criteria for the selection of clinical faculty. Prospective clinical faculty members must:

- Hold a valid teaching license and must have successfully taught at least three years
- Demonstrate content and pedagogical expertise
- Demonstrate effective communication skills
- Have a positive attitude and a professional demeanor
- Show genuine interest in preparing and supporting aspiring and novice teachers
- Demonstrate the ability to effectively prepare and support aspiring and novice teachers
- Demonstrate a willingness to work with other teacher preparation professionals
- Enjoy the respect of his or her colleagues

A prospective clinical faculty member must be recruited by a Lead Clinical Faculty member or a faculty member in the School of Education, must complete an application form, and must have a formal recommendation completed by his or her principal.

Training for the W&M Clinical Faculty Program is delivered through a three-credit, graduate-level course. Two credits are completed during two weeks of classroom-based instruction during the summer. Summer training focuses on the following topics:

- Exploring teacher preparation and the role of Clinical Faculty
- Building a professionally supportive relationship with the teacher candidate
- Setting expectations: Student teacher competencies
- Demonstrating professional practice through competency-based, reflective portfolios
- Effectively using clinical supervision techniques
- Observing instruction and collecting reflective data
- Implementing developmental coaching and conferencing techniques

This initial training relies on readings, discussions, collaborative activities, concept attainment activities, panel presentations, case studies, and simulations. Then, the additional one-credit portion of the training is completed during the school years, when the prospective clinical faculty are actually engaged in mentoring their assigned teacher candidates. During this time, the training takes the form of four follow-up meetings on campus, with two structured observation and coaching assignments to be ompleted. This structured, sustained, activity-based training model is intended to equip clinical faculty with a skill set for mentoring that is adaptable to the strengths and needs of different teacher candidates (Thies-Sprinthall, 1984) and emphasizing the critical roles of clinical observation and coaching (Kent, 2001) in teacher development. Specifically, the training is built upon a conceptual framework posited by Portner (2003), which identifies four fundamental roles of a mentor:

1. Fostering a trusting relationship
2. Assessing strengths and struggles
3. Coaching for proficiency and mastery
4. Guiding toward autonomy

Upon successful completion of the training, clinical faculty members gain adjunct faculty status, higher compensation than untrained cooperating teachers, opportunities to collaborate with W&M faculty, opportunities for teacher leadership roles within their schools/divisions, and, of course, the satisfaction of having a genuine impact on the profession by contributing to the preparation of new teachers. Additionally, clinical faculty members become part of a network of more than 225 active W&M Clinical Faculty and also join the cadre of clinical faculty in one of the 24 partnering schools in six school divisions, which constitute the W&M Clinical Faculty network. In each of these 24 partnering schools, a member of the teaching staff serves as the Lead Clinical Faculty member. The role of the Lead Clinical Faculty member is to serve as (1) the point of contact for placements, (2) a source of support for Clinical Faculty members and to regular cooperating teachers, (3) a coordinator of building-based internship activities, and (4) the primary liaison between the school and the university. The Lead Clinical Faculty role is integral to the W&M Clinical Faculty model and is considered by university staff to be a hallmark of the program.

Since its inception, the W&M Clinical Faculty Program has completed 13 training cohorts of more than 350 classroom teachers, approximately 225 of whom are currently active as clinical faculty members. While the majority of clinical faculty are concentrated in 24 partnering schools, there are a total of 35 schools across six divisions in which there is a W&M Clinical Faculty presence. More than 550 pre-service teachers have been served by the program and at least 300 novice teachers have, as well. In 2008, the program reached a milestone, at which time more than one-half of all the teacher candidate placements that year were with trained clinical faculty members. By 2011, this figure had increased to slightly more than 80%.

Research Questions

Despite the evident success of the program in recruiting, delivering training to, and employing clinical faculty, a fundamental question remains: Does training clinical faculty make a difference in outcomes for teacher candidates? In other words, are there differences in important outcomes for teacher

candidates—differences that are associated with whether teacher candidates completed their field experiences with untrained cooperating teachers (CTs) or with trained clinical faculty (CF)? Specifically, the present study addressed three research questions:

1. To what degree do midterm evaluations of student teachers placed with trained CF differ from those placed with untrained CTs?
2. To what degree do final evaluations of student teachers placed with trained CF differ from those placed with untrained CTs?
3. To what degree are there differences in mid-term and final evaluations of "Overall Teaching Effectiveness" between student teachers placed with trained CF and those placed with untrained CTs, as compared among evaluations by student teachers, cooperating teachers, and university supervisors?

Research Design

A causal-comparative research design was used to examine the research questions related to differences in CTs and CF affiliated with the College of William & Mary. Both groups met similar criteria for selection (namely, experience, tenure status, licensure, recommendation of a supervisor, and willingness), and both groups mentored teacher candidates from William & Mary. However, assignment of participants to respective groups was not purely random, necessitating a causal-comparative design. Similarly, teacher candidates were not randomly assigned to CTs or CF in a conventional sense of research design. Rather, placements were made by university staff unaware of any research intent and through regular means, thus further supporting the causal-comparative research design (Gall, Gall, & Borg, 2008). The study was limited to teacher candidates in the elementary (PK-6) and secondary (6-12) programs. The independent variable of interest was the training completed by CF.

Two dependent variables were identified: student teacher mid-term evaluations and student teacher final evaluations. Data were acquired from an extant database of mid-term and final student teacher evaluation ratings from 2008 through 2011. A total

of six evaluations were analyzed for each candidate:

1. Mid-term evaluation by cooperating teacher (including trained clinical faculty)
2. Mid-term self-evaluation by student teacher
3. Mid-term evaluation by university supervisor
4. Final evaluation by cooperating teacher (including trained clinical faculty)
5. Final self-evaluation by student teacher
6. Final evaluation by university supervisor

In the W&M elementary and secondary teacher preparation programs, student teaching is a full-time, 10-week experience, with mid-term evaluations being completed approximately five weeks into the experience and final evaluations being completed during the last week. The sample for this study totaled 319 distinct CT/CF-candidate pairs over a four-year period.

It should be noted that a single-school placement model is used in elementary and secondary preparation programs at William & Mary, meaning that teacher candidates are placed with one teacher for the duration of their 500+ hours of clinical experiences over two or three semesters (depending upon the program). Therefore, data sets were not confounded by experiences of individual candidates with both CTs and CF.

Data were analyzed using descriptive and inferential statistics. Measures of central tendency were reported to provide an understanding of the nature of the data, and two-tailed t-tests were conducted to determine if statistically significant differences existed between untrained CTs and trained CF, respectively. The level of significance selected prior to data analysis for rejecting the null hypothesis was .05.

Findings

To investigate the degree to which mid-term evaluations of student teachers placed with trained CF differed from those placed with untrained CTs, the primary data of interest were the ratings of teacher candidates' performances by the CF and CTs themselves. Student teachers in the W&M teacher preparation program are evaluated at the mid-term and final on 30 professional competencies, as well as on a summative rating of

"Overall Teaching Effectiveness." A three-point scale with the nominal categories of Below Expectations, Meets Expectations, and Exceeds Expectations is used. A rating scale and rubric provide anchor points for raters, and levels of performance are distinguished by quality and consistency of observed evidence (College of William & Mary, 2011). "Meets Expectations" is considered to be the intended standard of performance, and "Exceeds Expectations" is reserved for performance that is consistently of exceptional quality. A candidate may receive "Below Expectations" or "Exceeds" on individual competencies and still be judged as "Meets Expectations" for overall teaching performance, which is the standard for passing student teaching. The 30 competencies upon which WM teacher candidates are evaluated are organized into six broad domains, including Foundational Understandings, Planning for Instruction, Teaching Skills, Assessment and Evaluation of Learning, Classroom Management, and Professionalism. The W&M competencies are aligned with the standards of the Interstate Teacher Assessment and Support Consortium (InTASC, 2011), Virginia's Uniform Performance Standards (VDOE, 2011), and the National Council for the Accreditation of Teacher Education (NCATE, 2001).

The mid-term evaluations of a total of 319 student teachers were analyzed, with particular interest in the ratings of student teachers by CF and CTs. For purposes of quantitative analysis, ratings were converted to a three-point numeric scale, with Below Expectations as 1, Meets Expectations as 2, and Exceeds Expectations as 3. As depicted in Table 1, there was a statistically significant difference in the ratings of four competencies of the 30 student teacher competencies at the mid-term point. In each of these instances, trained CF rated the student teachers placed with them lower than untrained CTs rated their student teachers. There was no statistical significance to the domains represented by these four competencies.

Table 1
T-Test of Significant Differences in Mid-Term Evaluation Ratings of Student Teachers by Clinical Faculty (CF) and Cooperating Teachers (CTs)

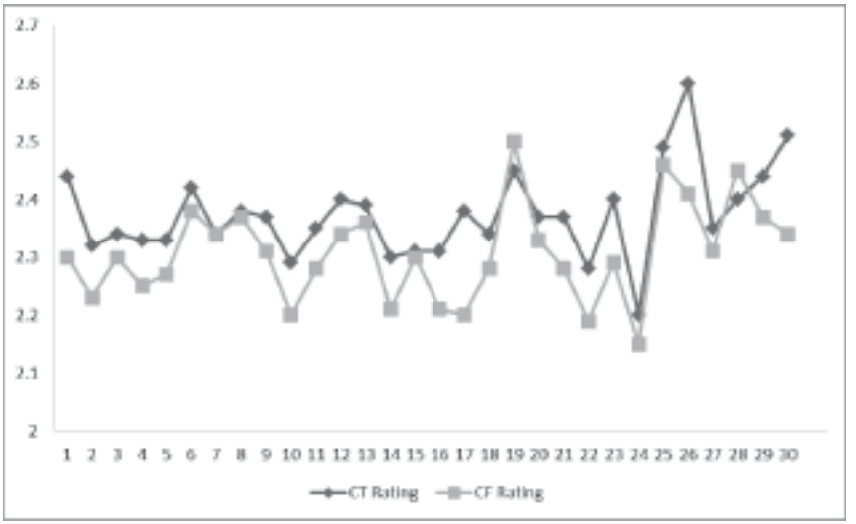
Student Teaching Competency	CF	CTs	t-value	df	*p* (two - tailed)
Demonstrates understanding of subject matter and pedagogy	2.30	2.44	-2.217*	301	.034
Demonstrates understanding of how students learn and develop …	2.23	2.32	-1.487	301	.138
Demonstrates understanding of the central role of language and literacy …	2.30	2.40	-.777	301	.438
Demonstrates understanding of how all students differ …	2.25	2.33	-1.291	301	.198
Demonstrates understanding of purposes and roles of PreK-12 education …	2.27	2.33	-1.112	301	.267
Plans lessons that align with local, state, and national standards	2.38	2.42	-.664	301	.507
Selects appropriate instructional strategies/activities …	2.34	2.34	-.019	301	.985
Selects appropriate materials/ resources …	2.37	2.38	-.076	301	.939
Teaches based on planned lessons	2.31	2.37	-.767	301	.444
Provides for individual differences	2.20	2.21	-1.518	301	.130
Uses motivational strategies …	2.28	2.35	-1.125	301	.262
Engages students actively in learning	2.34	2.40	-.891	301	.374
Uses a variety of effective teaching strategies	2.36	2.39	-.373	301	.710
Helps students develop critical thinking skills …	2.21	2.31	-1.416	301	.158
Monitors student learning	2.30	2.31	-.186	301	.852
Creates and selects appropriate assessments for learning	2.21	2.31	-1.694	301	.091
Implements assessment for learning	2.20	2.31	-3.035*	301	.003
Interprets/uses assessment results to make instructional decisions	2.28	2.34	-1.026	301	.306

Student Teaching Competency	CF	CTs	t-value	df	*p* (two - tailed)
Builds positive rapport with and among students …	2.50	2.45	.750	301	.454
Organizes for effective teaching	2.33	2.37	-.449	301	.654
Demonstrates use of effective routines and procedures	2.28	2.37	-1.396	301	.164
Demonstrates efficient and effective use of time	2.19	2.28	-1.457	301	146
Maintains a physically and emotionally safe learning environment …	2.29	2.40	-1.793	301	.074
Responds appropriately and equitably to student behavior	2.15	2.25	-.875	301	.382
Demonstrates professional demeanor and ethical behavior	2.46	2.49	-.487	301	.626
Participates in and applies professional development	2.41	2.60	-2.212*	301	.028
Demonstrates effective oral and written communication	2.31	2.35	-.607	301	544
Reflects actively and continuously …	2.45	2.40	.818	301	.414
Cooperates, collaborates and fosters relationships with families …	2.37	2.44	-.914	301	.361
Demonstrates potential for teacher leadership	2.34	2.51	-2.257*	301	.025

$*p < .05$

While four of the competencies were statistically significant in terms of their ratings by CF and CTs, additional analyses of the means across all 30 competencies revealed a persistent pattern. As represented by the line graphs in Figure 1, nearly every competency was rated lower by trained CF when compared to the ratings of student teachers by untrained CTs.

Figure 1
Differences in Mid-Term Evaluation Ratings of Student Teachers by Clinical Faculty (CF) and Cooperating Teachers (CTs)



The same analyses of ratings were conducted for the sample of final student teaching evaluations, and similar results were found. As indicated in Table 2, there were statistically significant differences in the ratings by CF as compared to ratings by CTs; however, only one statistically significant difference was found in the final evaluation ratings.

Table 2
T-Test of Significant Differences in Final Evaluation Ratings of Student Teachers by Clinical Faculty (CF) and Cooperating Teachers (CTs)

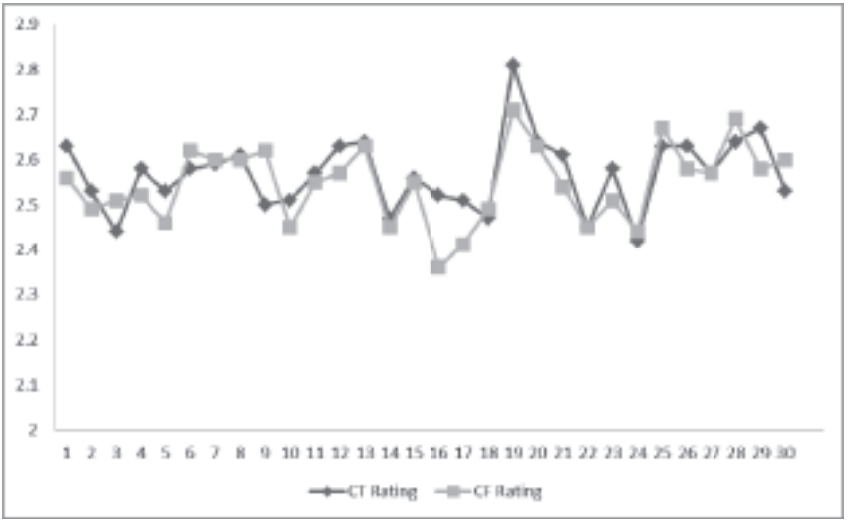
Student Teaching Competency	CF	CTs	t-value	df	*p* (two - tailed)
Demonstrates understanding of subject matter and pedagogy	2.56	2.63	-1.011	281	.313
Demonstrates understanding of how students learn and develop …	2.49	2.53	-.631	281	.528
Demonstrates understanding of the central role of language and literacy …	2.51	2.44	.976	281	.330
Demonstrates understanding of how all students differ …	2.52	2.58	934	281	.351
Demonstrates understanding of purposes and roles of PreK-12 education …	2.46	2.53	1.084	281	.279
Plans lessons that align with local, state, and national standards	2.62	2.58	.545	281	.586
Selects appropriate instructional strategies/activities …	2.6	2.59	.138	281	.890
Selects appropriate materials/ resources …	2.6	2.61	-.205	281	.838
Teaches based on planned lessons	2.62	2.5	1.726	281	.085
Provides for individual differences	2.45	2.51	-.898	281	.370
Uses motivational strategies …	2.55	2.57	-.221	281	.825
Engages students actively in learning	2.57	2.63	-.757	281	.450
Uses a variety of effective teaching strategies	2.63	2.64	-.087	281	.930
Helps students develop critical thinking skills …	2.45	2.47	-.225	281	.822
Monitors student learning	2.55	2.56	-.046	281	.964
Creates and selects appropriate assessments for learning	2.36	2.52	-2.540*	281	.012
Implements assessment for learning	2.41	2.51	-1.564	281	.119
Interprets/uses assessment results to make instructional decisions	2.49	2.47	.389	281	.698

Student Teaching Competency	CF	CTs	t-value	df	*p* (two - tailed)
Builds positive rapport with and among students …	2.71	2.81	-1.589	281	.113
Organizes for effective teaching	2.63	2.64	-.163	281	.871
Demonstrates use of effective routines and procedures	2.54	2.61	-1.146	281	.253
Demonstrates efficient and effective use of time	2.45	2.45	-.047	281	.963
Maintains a physically and emotionally safe learning environment …	2.51	2.58	-1.104	281	.271
Responds appropriately and equitably to student behavior	2.44	2.42	.309	281	.758
Demonstrates professional demeanor and ethical behavior	2.67	2.63	.650	281	.516
Participates in and applies professional development	2.58	2.63	-.571	281	.568
Demonstrates effective oral and written communication	2.57	2.57	.092	281	.927
Reflects actively and continuously …	2.69	2.64	.900	281	.369
Cooperates, collaborates and fosters relationships with families …	2.58	2.67	-1.217	281	.225
Demonstrates potential for teacher leadership	2.6	2.53	.935	281	.351

*$p < .05$

Also similar to the findings from the mid-term evaluations, the final evaluation ratings showed a pattern in which the ratings of student teachers by CF was in nearly all instances lower than the ratings by CTs. While there are exceptions to this pattern (e.g., competency #3) and while the visual gap between the line graphs is narrower than at the mid-term, the overall pattern is evident: Trained CF tended to rate their student teachers lower at both the mid-term and final points than their untrained CT counterparts (See Figure 2).

Figure 2
Differences in Final Evaluation Ratings of Student Teachers by Clinical Faculty (CF) and Cooperating Teachers (CTs)



Data for the summative rating—"Overall Teaching Effectiveness"—on the mid-term and final evaluations were also analyzed. For this analysis, all three groups that completed evaluations were included: student teacher self-evaluations, cooperating teachers (i.e., untrained CTs and trained CF), and university supervisors. As indicated in Tables 3 and 4, there were no statistically significant differences between mid-term and final evaluation ratings by the student teacher, cooperating teacher, and university supervisor.

Table 3
Overall Mid-Term Evaluation Rating by Student Teacher, Cooperating Teacher, and University Supervisor

Overall Teaching Effectiveness	CF	CTs	t-value	df	*p* (two - tailed)
Student Teacher Self-Evaluation	2.10	2.12	-.364	304	.716
Cooperating Teacher	2.29	2.39	-1.492	301	.137
University Supervisor	2.10	2.07	.793	298	.428

Table 4
Overall Final Evaluation Rating by Student Teacher, Cooperating Teacher, and University Supervisor

Overall Teaching Effectiveness	CF	CTs	t-value	df	*p* (two - tailed)
Student Teacher Self-Evaluation	2.37	2.48	-.1.688	278	.093
Cooperating Teacher	2.63	2.69	-1.051	281	.294
University Supervisor	2.69	2.64	.749	297	.454

While no statistically significant differences were found, two patterns emerged when reviewing the means of each group plotted as line graphs. The first pattern is depicted in Figures 3 and 4, in which student teachers placed with trained CF are rated *lower* both by themselves and by their mentoring teachers as compared to the student teachers placed with untrained CTs. However, a different pattern is evident in Figure 5. Here, that pattern is reversed, as university supervisors rated student teachers placed with trained CF *higher* than those placed with untrained CTs. Again, the differences are not statistically significant, but the patterns are evident and consistent for each group.

Figure 3
Student Teacher Mid-Term and Final Self-Evaluation Ratings

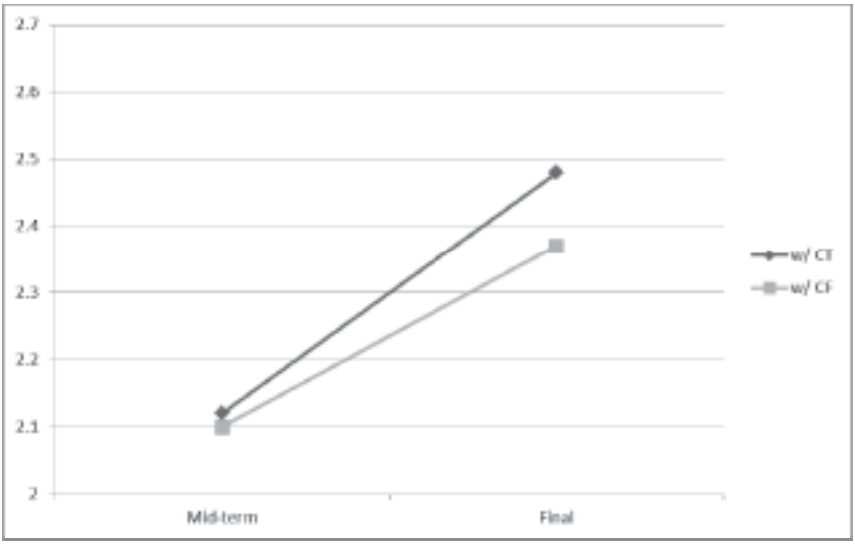


Figure 4
Cooperating Teacher Mid-Term and Final Evaluation Ratings

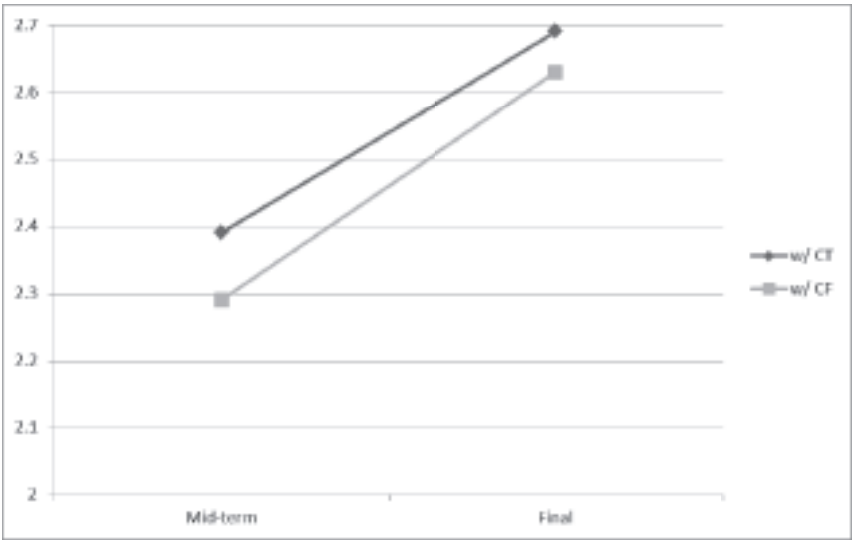
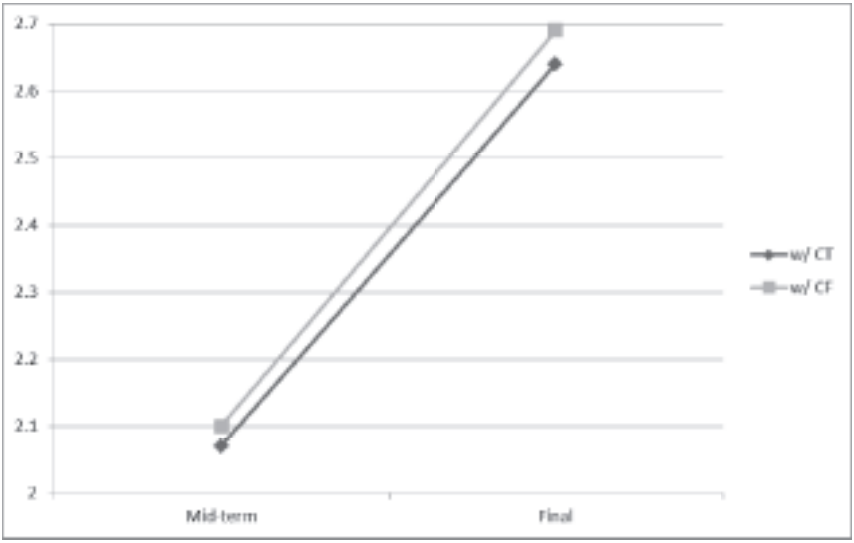


Figure 5
University Supervisor Mid-Term and Final Evaluation Ratings



Discussion

Previous research has suggested that training cooperating teachers for their role in supervising student teachers can make a difference in what cooperating teachers do while in their role and on cooperating teachers' abilities to summatively evaluate the performance of student teachers (Boatright, Phelps, & Schmitz, 1986; Bryant & Currin, 1995; Kent, 2001; Killian & McIntyre, 1987; Koster, Korthagen, & Wubbels, 1998). However, more recent scholarship suggests that the role of field experiences, broadly speaking, and of cooperating teachers, in particular, continue to be a weak link in the professional preparation of new teachers (Clarke, 2001; Darling-Hammond, 2006; Levin, 2002; Sykes, Bird, & Kennedy, 2011; Zeichner, 2010). Yet, within the 25-plus years represented by this body of research, the Commonwealth of Virginia has undertaken a concerted effort to articulate a common conceptualization of trained "clinical faculty" and has invested in the start up of clinical faculty programs for more than a decade. The present study sought to investigate effects of clinical faculty training through one longstanding university-based teacher

preparation program, and found affirmations of previous findings, as well as additional insights to be considered.

First, the findings from the analysis of mid-term and final student teaching evaluation results suggest that there is a difference between trained clinical faculty and untrained cooperating teachers with regard to the evaluation of student teachers. This finding echoes previous studies (Boatright, Phelps, & Schmitz, 1986; Bryant & Currin, 1995; Kent, 2001; Killian & McIntyre, 1987; Koster, Korthagen, & Wubbels, 1998), which concluded that training lessened the likelihood that evaluations of student teaching performances would be inflated. The W&M Clinical Faculty training course emphasizes the objective and ongoing assessment of teacher candidates' performance as one of the four fundamental roles of a clinical faculty member. More specifically, clinical faculty complete concept attainment activities to develop a depth of understanding of the W&M student teacher competencies, and they also engage in readings and simulation activities using observation techniques and the clinical supervision cycle. This depth of training may result in CF having not only a clearer, more grounded understanding of the expectations for student teachers' performance, but also stronger skills in gathering accurate information in order to determine teacher candidates' strengths and weaknesses (Gareis & Grant, 2010). Thus, the consistently lower ratings by trained CF compared to untrained CTs is likely not a reflection of weaker performance by their student teachers; instead, this phenomenon is likely an indication that clinical faculty provide more accurate - and, therefore, more helpful - *evaluations* of performance as well as *feedback* to their student teachers. While this finding essentially confirms the finding of some studies from more than a quarter century ago, it is especially important in light of our understandings about the vital role that specific, accurate, constructive, and timely feedback plays in the supervision and coaching of pre-service teachers (Acheson & Gall, 2011; Lampert, 2010). What's more, the phenomenon is not limited to the clinical faculty and cooperating teachers alone. Specifically, not only did trained CF tend to rate their student teachers lower than did untrained CTs, but student teachers placed with CF rated *themselves* lower than did their peers who were placed with CTs. In other words, there is evidence that student teachers *acquire* a

more accurate sense of their own performance when they are mentored by trained CF.

To summarize the first important finding of this study, more accurate assessments of teacher candidates can lead to better quality feedback and, presumably, to stronger performances for student teachers. The latter portion of this chain of logic—evidence of student teaching performance—was borne out in additional analyses of mid-term and final student teaching evaluations. Specifically, analyses of mid-term and final evaluations completed by university supervisors were conducted. In the W&M teacher preparation program, university supervisors are full-time or adjunct faculty whose role is to provide periodic formal assessments of student teachers, act as official supervisors of the experience, and serve as the instructors-of-record of the student teaching experience. Because of their more limited interaction with student teachers and given their central function as evaluators, university supervisors tend to represent an objective, third-party viewpoint in the student teaching triad. Thus, it is particularly telling that the pattern of lower ratings for student teachers placed with CF was *reversed* when the mid-term and final evaluations by university supervisors were analyzed. This finding suggests that the greater accuracy of the assessments and, presumably, of the feedback provided by CF resulted in stronger performances by their student teachers, as compared to the student teachers placed with untrained CTs. In other words, as measured by the objective evaluations of third-party university supervisors, student teachers who are mentored by trained clinical faculty tended to exhibit stronger professional competencies than student teachers placed with untrained cooperating teachers.

Taken together, the two findings discussed in the previous paragraphs suggest that the W&M Clinical Faculty training appears to make a difference in the accuracy of evaluations, the provision of feedback, student teachers' accuracy of self-assessment, and, ultimately, student teachers' acquisition of professional competencies. However, it must be reiterated from the presentation of the findings that these conclusions are based upon patterns of results. Very few of the differences between trained CF and untrained CTs were found to be statistically significant. While this is a caution, there are possible explanations

to be considered. One explanation for the lack of statistical significance in the data analyzed may be the use of a three-point rating scale in the W&M teacher preparation program. A three-point scale tends to diminish variance among ratings; therefore, statistically significant differences are less readily evident. As the data set increases over time with subsequent student teaching cohorts, this phenomenon may be diminished, if, indeed, it is occurring at all.

A second possible phenomenon may also explain why the patterns of differences are evident, while statistically significant differences are not. As described previously, the W&M Clinical Faculty Program has operated for more than a decade, training more than 350 area teachers, with a concentration of teachers in 24 "partnership schools." Each partnership school has a designated and trained Lead Clinical Faculty member, who has the responsibility to serve as a support to *all* cooperating teachers in the school (i.e., trained CF and untrained CTs alike). The Lead Clinical Faculty member also coordinates all building-based activities among cohorts of student teachers placed in the building. Related to the possible phenomenon being described is the fact that recent years have seen a majority of teacher candidates being placed with trained CF, meaning that a much smaller percentage of untrained CTs are being used for placements. The net effect of these factors may be described as the "rising tide lifts all ships" phenomenon, wherein the untrained CTs who continue to mentor W&M student teachers tend to be individuals who have served effectively in the role before and who may be incidentally improving their mentoring abilities through the support and coordination that comes from teaching in "partnership schools." This is to say that a tangential effect of the W&M Clinical Faculty model may be the strengthening of *all* placements, not only those with trained CF; thus, the differences measured by this study are present, but not always statistically significant.

Implications for Further Study

Ten years ago, Clarke (2001) noted that cooperating teachers play a major role in the preparation of new teachers, but how cooperating teachers are prepared for this work is an untapped research area. The present study suggests that training for the role á la the *clinical faculty* designation prescribed by the Commonwealth of Virginia may be an effective basis for how to prepare classroom teachers to mentor pre-service teacher candidates. More specifically, the W&M Clinical Faculty Program, which emphasizes the accurate and ongoing assessment of student teacher performance through multiple supervision strategies, combined with peer coaching techniques, may present an effective model for replication. This model may, indeed, be strengthened by its further emphasis on developing networks of clinical faculty both within and between schools with whom the university regularly partners, thus strengthening field experiences for student teachers placed with untrained CTs, as well.

The present study also prompts additional inquiries about possible differences associated with trained CF as compared to untrained CTs. For example, do CF and CTs perceive differences in their sense of efficacy for the role, especially with regard to observing, coaching, and evaluating student teachers? Do student teachers perceive differences in the quality of their field experiences? Beyond these process-focused questions, there are additional inquiries that target outcomes for teacher candidates. For instance, the present study found an important pattern in the evaluations of student teachers by university supervisors. Would similar patterns be seen in evaluations of student teachers by the principals (or designees) of hosting schools? Would similar patterns be evident on a different measure of teacher candidate performance, such as a comprehensive teacher portfolio evaluated by core faculty in the teacher preparation program? Finally, if longer-term outcomes for new teachers in their first several years of teaching are investigated, are there evident differences between those who had been mentored by trained CF and those supervised by untrained CTs? More specifically, would student teaching placement with a CF be positively correlated with new teachers' impact on their own students' learning, their intent to remain in the profession, or their emergence as teacher leaders?

These lines of inquiry will be investigated in future phases of a comprehensive empirical study of the W&M Clinical Faculty Program. In the meantime, evidence suggests that the clinical faculty initiative in the Commonwealth of Virginia may have deserved merit in terms of outcomes on the performance of student teachers.

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Dual Language Books as Entry Point for Learning about Geography and Culture: Teacher Education and International University Students as Co-Teachers

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Abstract
One phase of an ongoing study using dual language books as entry point for elementary social studies learning is presented. One international university student and one teacher education student relate their experiences as participants and co-teachers. Findings suggest peer collaboration and exposure to languages enhance cultural learning for teachers and children.

Introduction

Teacher educators and future teachers are aware that responding to the needs of culturally and linguistically diverse (CLD) children is a responsibility of all classroom teachers. American-born college students in teacher education majors, often have limited language experiences and can benefit from relationships with speakers of other languages, both for personal development and in preparation to work with linguistically diverse children and families. Simultaneously, American international university students often have limited experience in U.S. public schools. Universities are ideal settings for teacher education students and international students to collaborate, broadening their approach to diversity studies (Jennings, 2007) and developing cultural awareness, essential for teacher

candidates (Scott & Mumford, 2007). Specifically, the university setting, during teacher candidates' preparation can be an ideal time for teacher education students to broaden their experiences with speakers of various languages, to learn through interaction with students from other cultures and to share their culture with other campus students. Collaborative experiences between university international and teacher education students can support new teachers and may encourage them to enhance their future students' knowledge of world languages, and cultures while improving the school experience of CLD students. Collaboration may also assist international students in developing connections to English speaking university peers, considering working with school aged children and in future relationships with educators. The benefits of partnerships and collaboration among teachers and are well-substantiated in the professional development literature (Barth, 2001; Lieberman & Miller, 1984,2004; Fullan & Hargreaves, 1996; Randi & Zeichner, 2004; York-Barr, et al. 2006). Collegial professional development has become a norm in many settings where schools integrate learning community models for professional development and for implementation of district initiatives or reform initiatives (Hargreaves,1994; Hargreaves & Evans,1997, Lieberman & Miller, 1984; 1999;) while other schools have relatively few structured opportunities for teacher collaborative learning. Providing teacher education students with collaborative learning experiences at the undergraduate level, with peers in education and with others involved in the education of children can assist young teachers in developing a habit of collaboration. In their future classrooms, this collaboration may expand to include family members or community members who represent the cultural and language diversity within classroom. Partnerships between teachers and family or community members who represent diverse languages can help beginning teachers as well as veteran teachers to build communities of support, aid children who are learning English as a new language, expose children of all language backgrounds to diversity in culture and language and offer opportunities for community and family members to contribute to classroom learning environments.

During a multi-semester, ongoing teaching and learning project/study, teacher education students at our university

collaborate with peers to design and teach social studies lessons to local elementary aged students. Dual language books are used as an entry point for learning about geography and world cultures through exposure to varied languages. Thirty university students have participated in the project between 2007 and 2011. The spring-fall 2008 study is described in this article. During the fall 2008 semester, participants included a total of eight university students. Four international students in varied majors teamed with four Elementary Education majors to collaboratively design and teach about the international students' native countries: Japan, Korea, Palestine and Romania. Dual language stories, authentic tales from each region/culture were used as primary teaching materials. These dual language books served as entry points for children's learning and co-teachers' discussions and instructional planning. Participant experiences from this semester and other semesters, have been used to inform subsequent phases of the study and teaching project, and the model from the fall 2008 semester will be adapted for implementation in fall 2012.

Of the eight university student participants in the 2008 phase of this ongoing study and project, two participants, co-teachers Seiko and Kelly, have continued their work beyond the study. Because their collaboration serves as an excellent model for future studies and work, Seiko's and Kelly's narratives have been selected to represent and illustrate the eight co-teachers' experiences of participation. Since involvement in the initial study, Seiko has continued to participate in later semester projects, as graduate assistant in the Department of Early and Middle Grades Education at West Chester University, while Kelly has begun a teaching career in New Jersey. The purpose of the ongoing project and study focuses on the use of dual language books to raise children's and teacher education students' awareness of world languages. Through their growing awareness of language diversity, future teachers can be better prepared to work with culturally and linguistically diverse children and families. Social studies curriculum provides an ideal connection for children's learning about geography and culture. The goals of the 2008 project phase (to be applied again in 2012) were to: a.) build connections between English speaking teacher education students and bilingual, international university students in majors outside of teacher education, b.) help English speaking teacher

candidates gain comfort with language diversity by partnering with a bilingual peer and through the use of dual language materials to teach about world geography and culture, c.) offer international students the opportunity to experience partnerships with teachers and schools, and d.) support a local after school program serving the needs of the local community. In this article, we share the experience of two of the eight university student participants, Seiko and Kelly, who contribute descriptions of their participation in collaborative planning and teaching children in the after school setting. Their narratives are used to illustrate the framework of the larger 2008 study, involving eight university student participants.

Methodology & Project Structure

The 2008 project and study was implemented during an eight month period, May 2008 through December 2008. During this study, American-born, English speaking Elementary Education majors were paired with international university students in varied majors, to teach elementary school children about world geography, cultures and languages. Participants included four international university students in varied majors, most in their final year of study at the university and four Elementary Education majors, in their senior year, prior to their student teaching semester.

Eight university students who responded to a call for participation were included in the study. The project included two phases--collaborative lesson design (May through August) and collaborative teaching (September through December). The purpose of the 2008 study as part of an ongoing research project was to investigate the experience of collaboration for teacher education students and bilingual international students in various majors, and to understand the nature of peer learning in such partnerships. Data collected throughout the eight months included preliminary and post-project surveys, periodic reflective essays, observations of planning and teaching, lesson plans, and post project interviews. The following describes the timeline of the project and reflects data collection and analysis stages.

May-June—Four Elementary Education majors and four international university students were selected for participation.

Collaborative teaching teams were formed, and included one education major and one international student. Students met to select teaching materials including dual language children's stories and informational texts about the international students' native countries (Japan, Korea, Palestine, and Romania). Participants completed pre-project surveys and the project timeline for planning and teaching was distributed.

August-September—Co-teaching teams met four times, to design and mini units about the international students' home countries: Japan, Korea, Palestine and Romania. Mini units included two lessons about each country, and were required to integrate the use of a dual language book and to introduce physical and human geography. Mini units would be taught to children involved in the local YMCA after school program. Pairs were given dual language children's books in English and one of the following languages: Korean, Arabic, Romanian or Japanese as resources to introduce or use in their lessons about Korea, Palestine, Romania and Japan. Dual language texts selected were authentic folktales from Japan, Romania and Korea, and informational texts about related concepts were provided to co-teachers. Two editions of the texts used in the lessons were given to children who participated in the project. One edition of each text in Spanish/English was given to children whose families were bilingual and spoke Spanish as their home language. Co-teachers visited the teaching site, the local YMCA after school program to meet the children, and to arrange teaching and learning spaces. Throughout the project, participants constructed reflections on their collaborative lesson design, collaborative teaching, and learning. Lesson plans and observations of planning and teaching were collected and included in study data.

October through December—Co-teaching teams taught their two lessons to children in the YMCA after school program. All eight university participants attended the weekly after school sessions and served as co-teachers. Teaching pairs worked with small groups of children in the after school setting, each group convening four times. When not teaching, university students served as support teachers and observers. During the final sessions, children constructed dual language stories. University students facilitated the writing process in English, and later added translated text in Japanese, Korean, Arabic and Romanian.

Participant reflections on collaborative teaching and observations of teaching were sources of data collected during this phase of the study.

December—The eight university participants convened for a final focus group meeting, discussing their experience of participation in the study. Participants completed post-project surveys and final reflections. Participants were invited for post-project interviews.

Post Project Work—Of the eight participants, Seiko and Kelly, continued to be involved in university opportunities, and have continued to work on extensions to the 2008 phase of this ongoing research. At the time of the study, Seiko, a native Japanese speaker was studying Clinical Psychology and Kelly, a native English speaker was studying Elementary Education. They presented at one local and one state conference, and were invited to share their work during two university events.

For this article, Seiko's and Kelly's narratives were selected as models to be used to frame typical experiences of the eight university participants, as supported by data from the sample of eight students. Their narratives are embedded throughout the discussion of findings to portray two of the eight students' experiences in greater detail. Data collected throughout the study, pre and post-project surveys, periodic reflections, field notes from observations, co-teachers' lesson plans, and post project interviews, were analyzed for emergent themes. Themes of collaboration, peer learning, and use of dual language materials were identified as most significant, emerging from multiple sources of data and from multiple participants.

Discussion

Analysis of data collected throughout this study suggest three significant findings: a.) collaboration between teacher candidates and international peers and exposure to varied languages leads to cultural learning for teachers, international students and children, b.) university participants benefit from experiences outside of their typical or expected college or teaching experiences and c.) dual language materials as a resource for teaching about world cultures and languages can serve as an entry point for discussion between diverse participants.

Collaborative Planning Leads to Cultural Learning.

During the 2008 project, teaching pairs met periodically to collaboratively plan to teach about their topics: Japan, Korea, Palestine/Ramadan, and Romania. Following early planning meetings, the eight participants shared some of their concerns related to working with a new partner whose field of study and language origin differed from their own. Most participants suggested that they were hesitant at first, regarding the new partnership and were concerned about communication and common experiences in teaching. Seiko and Kelly depicted their initial hesitations. Seiko described,

> Most of the students were majoring in teaching and they had knowledge and experience teaching. Teaching was new for me. I was studying Psychology. I was overwhelmed hearing that we had to organize lesson plans and teach children. Kelly and I were paired. I felt we could work cooperatively.

Kelly explained,

> I was excited, scared and hesitant about working with someone who did not know about lesson planning and teaching. Growing up in a non-diverse community, I wasn't comfortable communicating with individuals who didn't have my background.

As steps in the planning for instruction, partners selected dual language books for use in teaching about their topics. Suggestions for authentic texts were provided to co-teachers and included folktales from the countries represented or informational text about each country or cultural aspect of the country. Seiko and Kelly selected a dual language children's book in English/Japanese to raise student awareness of the Japanese culture and language, Urashima and the Kingdom Beneath the Sea. They used additional informational texts, children's and adults in planning and teaching. Following the selection of their tests, co-teachers determined appropriate experiences for children's learning about their topic. For instance, Seiko and Kelly discussed essential content and potential skills to teach children as

they learned about Japan. Their differing, yet complementary experiences and knowledge led to the construction of two effective lessons. Children experienced written and oral Japanese, co-taught by a native Japanese speaker and a native English speaker, modeling collaboration, curiosity and knowledge about world cultures, and languages. Children were introduced to the geography of Japan and several cultural commonalities of Japanese people, including religion and national celebrations, in comparison to their American, family, and Mexican (most children were of Mexican heritage) experiences.

All university participants noted the potential and strength of collaboration and the positive experience learning about world geography and culture from someone outside of their fields of study. Kelly described her experience working with Seiko:

> I was unsure about talking to Seiko at first. We discussed our ages and college majors. I asked her to tell me how life in Japan is different from the United States. I have never left the country, and I know little about life elsewhere. Seiko said New Year's Eve and food are differences. We decided these would be the foundations for our Japan lessons. Seiko talked about New Year's Eve in Japan, and I was intrigued. We decided that throughout the lesson, Seiko could teach the children how to say different words in Japanese. We left the first meeting with a solid understanding for each other and our work. We were given resources for planning, and I learned about Japan. I prepared questions for Seiko. The next session, we formed our lesson plans easily. I taught Seiko how a lesson is structured, and we worked well together to create a lesson about New Year's Eve in Japan and then about Japan's geography and culture. We talked about the teaching process to make Seiko more comfortable.

Seiko described her experience in initial meetings with Kelly:

> We had three meetings to plan lessons. We chose dual language children's book for our lessons; well-known stories told to me by my parents. Urashima Taro was most memorable for me. Kelly utilized a lesson outline that she learned in her teaching classes. I suggested writing children's names in Japanese. We decided to talk about geography of Japan and New Year's Day in Japan,

> compared to America. I learned a lot about the teaching and planning process by talking to Kelly.

Kelly's story represents many of the experiences of teachers in the U.S. who have had limited experiences in other countries. Both narratives illustrate how interaction with diverse university peers led to learning about self and others. All eight participants reflected that their learning about and from one another through collaboration was a benefit of participation in the study, and three of the four partnerships extended their communication and friendships beyond the teaching semester. The richness of the diverse partnerships suggests that teachers and teacher education students should be encouraged to seek opportunities to work with diverse individuals inside or outside of their school contexts. Both Seiko and Kelly developed understanding of the influence of collaboration and collegiality through their participation in the study. Seiko learned about teaching, and brought to the collaboration experiences as a Japanese woman, international student and psychology major. Kelly learned about Japan and the experiences of a native Japanese speaker and brought to the collaboration experiences as an American woman, familiarity with U.S. schools, and experience as a teacher education student and pre-service teacher. Data confirm that is rich potential for teachers to collaborate with peers in varied fields, and with CLD families or community members whose diverse experiences can extend to the classroom, enriching children's learning.

Exposure to New Languages Benefits Adults and Children.

Participants reported that teaching about world languages, geography and culture was motivational for them and for the children they taught. Seiko described,

> After the first lesson, [where I read Urashima Taro in Japanese] one child asked if I would read the first paragraph again. She seemed excited. A second child asked me how I say thank you in Japanese, and after I said it in Japanese, he said it back to me. Children continued to interact with me after our lessons had ended. During the second lesson on the Japanese New Year, we discussed differences in New Year celebrations in Japan and America.

> Two children from Mexico talked about New Year's in all three countries. Our discussion became more diverse; it was a good opportunity for me to learn about Mexican culture, from the children.

Other international participants described similar positive interactions with children. Through teaching, participants were able to share their life experiences and lean about children's cultures. Teacher education students also noted similar positive encounters. Kelly described,

> Teaching about Japan was a great learning experience for me as an educator that I know I would not get anywhere else. Working with language and country content, and students with different ethnic backgrounds is something that I was not used to. I'm very thankful for the experience. Seiko wrote the children's names on nametags both in English and in Japanese, and children practiced writing their names in Japanese. Observing their excitement to write in Japanese was one of the neatest parts of our teaching. Each child loved being able to write in Japanese and many children filled two pages in a notebook writing their name in Japanese.

All participants responded in reflections, exit questionnaires and during interviews that they valued exposure to new languages and cultures of their partners and the children they taught, and stated that they felt it benefitted the children who participated.

Dual Language Resources as Common Entry Point for Discussion.

All participants selected and used children's books, written in two languages, in their teaching. Each book was printed in English and the native language of the international partner--Japanese, Romanian, Arabic or Korean. The books provided a common entry point for communication between co-teachers, who shared initial hesitations in working with their new partner. Furthermore, the dual language resources served as entry point for learning about social studies topics of physical and human geography, appropriately connected to national and state social

studies curriculum standards and frameworks. International participants reported that the dual language books enabled them to feel comfortable in collaborative planning and teaching and allowed them to feel like "equal partners" in the collaboration. Though most had limited or no teaching experience, their international and linguistic experiences were valued and central to the collaboration and teaching. Similarly, English speaking partners noted enthusiasm for using the resources in their future classrooms, though they reported initial hesitations about the use of dual language books as English-only speakers. Furthermore, all participants referenced the success of dual language resources in engaging children's learning. Kelly reflected,

> A successful part of our teaching was reading the dual-language book, Urashima and the Kingdom Beneath the Sea. The Japanese tale was written in English and Japanese, so Seiko and I read in both languages to the children. The children gathered to hear the story, and they watched and listened to Seiko in amazement as she read fluently in another language, yet they sat very close to me and not at all to her. We think that because of the comfort in speaking English, their primary language, they sat near me as I read in English. We provided each student with a copy of the book to take home, and that evoked excitement from everyone. Using the dual-language book was, without a doubt, the most successful part of our entire teaching experience. Throughout the two lessons, students interjected many comments and questions. I was happy to see their excitement to learn about the content. Students made comments about countries where their parents were born. Some were from Mexico. Children made connections between the U.S., Japanese, and Mexican New Year. It's important for students to make personal connections, especially when learning about how people live in different areas of the world. This helps close the gap between different ethnicities, religions, & cultural backgrounds. To conclude our teaching, we worked with children to construct a dual language story.

Kelly's narrative, like reflections from other participants, illustrates how the dual language resource, equally accessible to all participants, and used as a children's learning aid, facilitated

communication, collaboration, discussion and connections. Through their collaboration, and teaching, Seiko and Kelly learned about each other's cultures, and the cultures of the children they taught. They discussed teaching and learning consistently throughout their collaboration, and worked as co-teachers throughout the project. They discussed their work as partners, clearly indicating that the work was collaborative and that decisions were shared.

Collaboration Leads to New Experiences.

As two university students with different language and cultural backgrounds, fields of study and career paths, Seiko and Kelly demonstrated the potential for meaningful and unique collaboration. All participants described that their work in during the project and with their partner caused them to experience something new including: a.) collaboration with someone outside of their major, b.) working with diverse children, c.) learning about world languages or countries, d.) thinking differently about teaching, and e.) work with children whose cultural or linguistic experiences differ from their own. While providing new experiences for international students was not a primary goal of this research, it was significant in influencing the design of this phase of the study. As part of larger university conversations regarding the culture of the campus in supporting international students, it was my intention to bring together teacher education students and international students in the expectation that each group would find support through one another. In the next phase of the project, 2012, international students will again, be included as co-teachers. Commenting on her participation and opportunities for new experiences, Seiko reflected,

> This was my first time teaching children in a structured setting. I don't usually have a chance to talk to children in everyday life. Working with Kelly, who has a lot of experience in teaching, I learned a great deal about how to interact with children in settings like this. I think this pairing of one international student and one student from the educational program worked effectively. If I were working with another Japanese student, we would not know how to manage this type of setting. When I grew up

> in Japan, students were predominantly Japanese, and I did not have opportunities to meet people from other countries. The only time I had a chance to see them was on television or movies. I feel that having opportunities to learn about other cultures from people of those origins would make children more aware of cultural differences and more open to learn about other cultures. I had a good opportunity to interact with children from other countries [Mexico]. I am interested in working with people from other countries for my career goal, so I am certain that this experience helped me to learn more about cultural diversity.

Kelly described,

> Participating turned out to be an incredible learning experience. I have realized the importance and the benefits of using dual-language materials in my classroom, and I hope to incorporate dual language books and resources to bridge the cultural gap in a classroom.

All university students reported a broader understanding of collaboration, a deeper awareness of cultural and linguistic diversity, exposure to new teaching tools (dual language books, as well as other materials) and understanding of ways to engage children in learning about their world. Kelly's and Seiko's narratives characterize this learning and represent similar reports from other participants.

Through analysis of data collected during this 2008 phase of the multi-semester teaching project and study, and supported by findings from other phases of this study 2007 to present, it is clear that teacher education students benefit from exposure to world languages, in their personal and professional development. Dual language resources provide an entry point for communication with speakers of other languages which may include co-teachers as in the 2008 phase of the project, or more likely, family members of their future students for whom English is a second, or new language. It is clear that collaboration can take many forms and involve peers in common or very unique career fields, and it can be suggested that children in a variety of learning settings can benefit from learning about world geography, languages and cultures from teachers who value diversity and who seek

opportunities to integrate authentic learning experiences through authentic texts and by engaging those with experiences that supplement their own. In a future phase of the project, again joining international and American teacher education students, we will seek opportunities to integrate a third partnership—community or family members as a way to further enrich teachers' and children's experiences and in an effort to investigate the nature of collaboration among teachers, family and community members.

The purposes of this study and phase of the teaching project were to: a.) build connections between English speaking teacher education students and bilingual, international university students in majors outside of teacher education, b.) help English speaking teacher candidates gain comfort with language diversity by partnering with a bilingual peer and through the use of dual language materials to teach about world geography and culture, c.) offer international students the opportunity to experience partnerships with teachers and schools, and d.) support a local after school program serving the needs of the local community. Participants' responses on surveys, during interviews and on written reflections confirm that pairing English speaking teacher candidates with culturally and linguistically diverse peers can encourage participants to learn from one another, increase confidence in working with children and adults whose language experiences differ from their own and can provide a springboard for adults' and children's learning about world geography, culture and language. Participants in the multi-semester project have also provided a benefit to local school children in exposure to world cultures and languages, and while data were not collected from children, directly, observations during the teaching semester suggest that children were eager to learn from and about world languages. Implications for classrooms include encouraging greater family and community involvement, capitalizing on local university's diverse and international student population and providing resources and opportunities for children to learn about world languages as connected to social studies or language arts curricula.

Reflections

As a teacher educator, my work includes helping teachers to confront assumptions and facilitate collaboration, and collegiality. As an English speaking teacher, modeling an interest in building awareness of linguistic and cultural diversity, including speakers of other languages prominently in my teaching and encouraging "independent rather than standardized behavior" (Scott & Mumford, 2007, p. 56) where teacher candidates learn to embrace linguistic diversity, is a critical task. Participants in this project experienced collaborative teaching and learning that integrated diverse perspectives. As a monolingual teacher, Kelly began to challenge assumptions about speakers of other languages, international students and cultures different from her own. This is a critical component of teacher education for the majority monolingual teachers whose beliefs about CLD determine the culture of a classroom. Without opportunities to challenge assumptions about linguistic and cultural capital, stereotypes and conceptions/misconceptions about global cultures, teachers may marginalize and distance CLD students or perpetuate discriminatory practices in education (Obiakor, F., Smith, D. & Sapp, M. 2007; Taylor, Bernhard, Garg, Cummins, 2009). As knowledge about English language learners evolves rapidly, and teachers understand the critical role first language acquisition and maintenance has in developing additional language skills (Wu, 2005; Haynes, 2007), the English speaking majority of teachers may seek opportunities to collaborate with community members who speak varied languages. Teachers and families may realize the importance of maintaining native languages by including dual language literacy at home and at school (Snedden, 2008). Furthermore, as U.S. teacher education programs change to incorporate candidate learning about linguistic diversity and working with children and families for whom English is a new language, new academic language about and experiences with English language learners can be included in professional preparation courses. Opportunities for collaboration with speakers of various languages and persons of diverse backgrounds may emerge and can be meaningfully connected to teacher education programs. Similarly, the experience of collaboration may encourage Seiko and international participants

to work with teachers in P-13 settings. It may encourage Kelly to support children's developing understanding of our global community, seek out partnerships and develop as a teacher leader.

Data from the 2008 phase of this ongoing project, involving eight participants, confirm that these connections have great potential for teachers and children, and in subsequent phases of the study, the nature of collaboration including teacher education students, community/family members and international colleagues can be more deeply explored. Narratives from Seiko and Kelly illustrate the potential for further exploration. Collaborative opportunities can serve as a step in helping new teachers foster multiple languages through the home-school connection (Fain & Horn, 2006). Through such partnerships, we can support school-community collaboration, foster reflection and cultural awareness (Scott & Mumford, 2007), develop leadership and school-family partnerships while broadening individuals' understandings and appreciation of cultural and linguistic diversity. Following this project, Seiko and Kelly presented their work in four public settings, continuing their relationship, development and learning, and Seiko has continued to work on the project's subsequent phases. As another result of participation, throughout her teaching career, Kelly may invite students and families to share cultural and linguistic diversity in the classroom, challenge her assumptions about speakers of diverse languages, and reach out to families whose native languages differ from hers while continuing to develop her knowledge about the world. It is important that teachers facilitate children's accurate and comprehensive knowledge of the world. The lessons Seiko and Kelly taught merged these essential elements, initiated conversation and collegiality, and provided entry point for children's learning about the world. Seiko has continued to work with linguistically diverse families of pre-school children, further developing collaboration among school and families. As a result of her participation, Seiko may be willing to develop partnerships with schools, teachers and children in the U.S. or elsewhere. She has demonstrated her interests in this through continued work in my research and in our department at the university. The partners' narratives, as examples of two of the eight participants in the 2008 phase of the study, confirm the need for universities to create spaces peers to collaborate, across majors

and cultures. This study suggests the need for future and practicing teachers to make classrooms welcoming places for all children where cultural and linguistic diversity richly influence the classroom context and to make classrooms places where all children, inclusive of cultural or linguistic experience develop knowledge of global languages and cultures.

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Submission requirements

Authors should email an electronic version of the manuscripts to lbutler@odu.edu
Inquiries about The Teacher Educators' Journal may also be directed to lbutler@odu.edu or at 757-683-6448.