Targeted Teacher Training: Developing Bilingual Science Teachers through a Residency-Based Teacher Preparation Program

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Abstract

The profound shifts in the public school demographics across America are well documented (and highly reflective of international patterns), particularly in large metropolitan areas. One such demographic group includes English Language Learners (ELLs) which has witnessed an increase of more than one half million students educated in the public school system between 1990 and 2014 [1]. It follows that a deep need arises to re-tool teacher training programs to ensure that new teachers are equipped with the skills and understandings needed to teach linguistically diverse learners. Thus, targeted training programs that allow preservice students to learn and continually practice the needed pedagogy to successfully address this population is necessary [2]. In response to this need, an intensive, clinically rich teacher education program was designed by a core of faculty at a university in the metropolitan region of New York City to prepare bilingual science candidates to teach secondary science in multilingual classroom environments. This program, Project BEST (Bilingual Educators of Science and Technology) received state-wide recognition and government funding to support two cohorts of bilingual preservice teachers from 2011-2014. The focus of this presentation is to share the design features of this teacher residency model including unique course offerings along with a general overview of program outcomes.

1. Introduction

The current climate surrounding teacher preparation in the United States is best described as tenuous. While research suggests that teacher education programs prepare teachers that acquire essential skills and abilities needed for the development of effective classrooms and that these same students stay in the profession longer than those whom aren't trained in these settings [3] there is still a barrage of criticism as to just how well these schools are succeeding in their mission [4]. Furthermore, within the schools of education themselves, heated discussions continue as to how best to prepare our future teachers. As researchers suggest [5], there are multiple promising practices that should inform the design and implementation of teacher preparation programs including, applicant selection, clinical practice settings, and coursework surrounding core teaching practices.

Indeed, the National Council for the Accreditation of Teacher Educators, NCATE, commissioned a Blue Ribbon Panel (BRP) charged with the task of articulating a vision for revamping practices in teacher education. The BRP took the position that, "To prepare effective teachers for 21st century classrooms, teacher education must shift away from a norm which emphasizes academic preparation and course work loosely linked to school-based experiences. Rather, it must move to programs that are fully grounded in clinical practice and interwoven with academic content and professional courses. (p. ii)" [6]

Specifically, in the Blue Ribbon Report [8] the Panel called for more rigorous accountability; strengthening candidate selection and placement; revamping curricula, incentives and staffing; supporting partnerships; and expanding the knowledge base to identify what works and supports continuous improvement. The *clinical residency model* has been looked to as a "new" teacher preparation model that could heed the Panel's call.

The clinical teacher residency model redefines preparation in that the program attempts to seamlessly weave together both teaching and coursework within partner K12 school sites. The key design features include *residents* (those studying to be teachers) working in classrooms on a full-time basis with a strong partnership between the university and P12 faculties to ensure targeted training experiences aimed at improving student achievement. Many school districts and teacher education colleges have partnered in the past 10 years to implement this clinical residency model, particularly in the large, metropolitan areas where teacher shortages most often exist [7]. This paper describes one such residency, Project *BEST: Bilingual Educators of Science and Technology*.

2. Clinically Rich Teacher Preparation Programs

The Project BEST clinically rich model was implemented within a School of Education with a long history in preparing beginning teachers in the region (New York City and Long Island). As a nationally accredited institute of higher education, the University has two other models of teacher preparation that prepare new teachers including a *traditional model* meeting the New York State required hours of clinical preparation (e.g. 580 hours) and the *intensive model,* in which teacher candidates participate for a full year in the same classroom completing 680 hours of practice. The third model is a natural expansion of the intensive program to a *full residency model* where both coursework and clinical practice is completed at the partner school (middle and/or high school) and residents work in classrooms with experienced teachers who serve as their mentors for a full year, on a full-time basis (1300 hours).

3. Program Design

Project BEST was a 12- month initial teacher education program offering a pre- service teacher candidate residency in partnership with two high need school districts on Long Island, New York. This program was piloted during the academic years of 2012-2014 and utilized a cohort model. Teacher residents were placed in partner schools during the summer school program and then immersed in the daily life of the school four days per week during the full academic year under the guidance of both school-based and University faculty mentors. Residents graduated with a Masters of Art with recommendation for initial certification in 7-12 science (biology, chemistry, physics or earth science) with a bilingual extension

4. Partnerships

Strong partnerships were established with two high-needs school districts on Long Island. As reported in the Long Island Index, a gap in educational achievement continues to exist on Long Island, separated by race as well as income and is considered third most segregated region in the United States [8]. School District 1 serves 3,000 students, 51% of whom are eligible for free or reduced lunch and 8% identified as English Language Learners. School District 2 serves nearly 4,000 students, 79% of whom are eligible for free or reduced lunch and 33% of students identified as ELLs. Spanish and Haitian Creole are the predominant native languages of the ELLs in the districts.

5. Theoretical Foundation Driving the Clinical Residency Model: Interdisciplinarity of Science and Bilingual Education

Effective teacher education must prepare teachers who are expert in content and able to differentiate instruction in challenging and changing contexts. Many mainstream classroom teachers face challenges in working with English language learners (ELLs). ELLs are the fastest growing segment of the public school population. Over the past 15 years, the number of ELL students has nearly doubled [9]. While a number of sheltered instruction models encourage content area teachers to adapt their curricula for ELLs, these models are aimed primarily at in-service teachers [10]. Few programs prepare pre-service content area teachers to specifically address the issues of bilingual and English language learners [11].

6. Promising Practices of the Clinical Residency

Multilingual Teacher Candidates. The success of Project Best relied on the identification of residents, who had an undergraduate degree with a major in a science discipline, bilingual proficiency in Spanish or Haitian Creole, and a commitment to teaching in high needs schools. Locating candidates who possessed a strong background in science and bilingual proficiency has been a challenge and the University has drawn on multiple resources to identify qualified candidates.

Mentorship. A layered mentoring approach had been established as a promising practice of Project BEST and consisted of two partner school Resident Coordinators, University project directors, University-based mentor coordinator, and school-based teacher mentors. Resident Coordinators at each of the school districts worked closely with University faculty project directors and the mentor coordinator to select teacher mentors, met regularly with residents, and developed a schedule for teacher residents allowing for meaningful observations across both partner sites and across grade levels and disciplines. Teacher mentors participated in ongoing professional development throughout the residency to build the professional learning community and develop further mentoring skills and knowledge.

Coursework. A unique feature of this program was found in the required coursework. Specifically, a co-

taught course highlighting the integration of science and bilingual methods was found to be one of the most supportive in developing residents' abilities to plan and implement effective lessons in their bilingual classrooms. A wide body of literature on instructional strategies informed the development of this co-taught course [12, 13]. Goals specific to the bilingual methodology included supports and strategies to allow ELLS opportunities to build fluency within the content area. Goals specific to the science instruction included the introduction and practice of planning with the Biological Sciences Curriculum Study (BSCS) 5E-learning model to support inquiry oriented lessons [14].

The course was divided into three modules developed by the methods instructors to exemplify effective science teaching using the 5E model within a Sheltered Instruction Observation Protocol (SIOP) framework. Each module included course readings accompanied by written reflections and class discussions, the modeling of a science lesson with a focus on one of the three SIOP components, and an Instructional Round at our clinical partner site to observe opportunities and challenges of the implementation of the SIOP component within a science context [15]. The three modules explored were selected due to their important nature in the learning of science within a bilingual environment. Module 1 focused on comprehensible input; Module 2 examined student engagement and Module 3 investigated the development of a lesson to build on student's prior knowledge.

Unique to this course was the opportunity to join together for instructional rounds at our partner school sites that afforded multiple opportunities for the residents to observe and reflect upon instructional strategies learned in the course with faculty and peers. For example, during instructional rounds for comprehensible input, residents were instructed to note examples of clear, slow speech and paraphrasing; clear explanation and modeling of academic tasks; explanations of new vocabulary; context-embedded language; and the use of graphic organizers to support student listening and reading tasks. Residents were then asked to reflect on how they could utilize the observed techniques in their own teaching practice.

7. Program Outcomes

This evaluation investigated five variables of interest including content knowledge, pedagogy and instructional ability, attitudes toward teaching, program evaluation, and impact on student achievement to determine if the residency model was more effective at preparing teachers than the other models (traditional/intensive) currently utilized. Recent research indicates that these five variables are important predictors of success as a teacher [16]. A comprehensive examination and discussion of the findings on the effectiveness of Project BEST are published elsewhere [17].

8. Conclusion

This paper intended to describe a clinical residency teacher preparation program that aimed to prepare bilingual science teachers. In particular, the design features that drove the implementation of this relatively new model of teacher preparation was highlighted in greater detail to inform other teacher preparation programs considering implementing this type of preparation model.

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