Early Career Teacher Attrition: Searching for Answers in Preservice Preparation

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The exodus of teachers realized in public schools negatively influences student outcomes, teacher potential, and overall school performance (Ingersoll & Smith, 2004; McCleskey & Billingsley, 2008). Though some turnover is expected from situations in life such as retirement and raising families, the degree at which teacher attrition is increasing warrants careful consideration. Data illustrate alarming figures and highlights areas where further study is needed.

Attrition is noted throughout the U.S., but tends to hold higher prevalence among certain teacher and student subgroups (McLeskey & Billingsley, 2008; USDE, 2008). Urban and rural schools with higher rates of minority students living in poverty report lower teacher retention than those teaching in schools with opposite status (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2007). Within secondary education content areas, retention discrepancies are also revealed: mathematics and science present higher attrition than other teaching genres (USDE, 2008). Of special concern, however, are the attrition rates of early career educators (Boe, Cook, & Sunderland, 2007) with approximately 30% leaving during the induction period, the time considered as the first 3 to 5 years after professional entry (Ingersoll & Smith, 2004). Within this group, attrition percentages fluctuate depending upon teacher characteristics, teaching assignment, and student population. For example, early career teachers who demonstrate higher scores on certification exams and are employed in low performing/high diversity schools are known to quit teaching at greater rates than teachers with lower scores teaching in similar school settings (Boyd et al., 2007).

Experienced teachers are considered keys to the success of high performing schools and are especially needed for certain types of students. Novice educators must have time to hone their craft (Griffin, Winn, Otis-Wilborn, & Kilgore, 2003) and put theory learned during preservice education into practice (McLeskey & Billingsley, 2008). Early career educators who give up too soon diminish opportunities for themselves, students, schools, and communities.

Many who leave teaching may not have done so had they been better prepared to meet the challenges of today's classrooms (Darling-Hammond, 2006b; McLeskey & Billingsley, 2008). Though increased student diversity was predicted long ago and continues to rise, teacher education's response is described as inadequate in providing future teachers with the skills, dispositions, and experiences necessary to meet the needs of all students. A homogenous teaching force, consisting of a middle class, white, female majority, finds themselves teaching students from dissimilar backgrounds. Diversity growth makes traditional methods of preparing teachers passé, no longer sufficient for leading early career educators toward satisfaction in their work and employment longevity. Inadequate coursework and few and/or ineffective clinical experiences (defined as experiences placing preservice teachers in school settings for the observation of or participation with students; in this article, the term includes both course field experience and student teaching) are identified by teachers feeling ill-prepared by their preservice programs of study, especially regarding the understanding and teaching of students from diverse populations (Darling-Hammond, 2006a). Teachers exasperated by increasing demands to meet the learning needs of all students, feel a loss of self-efficacy, and find it motivating to quit.

Teachers' perceptions of their professional preparation elucidate recurring themes regarding diversity, including struggles with teaching students with disabilities, English language learners (ELLs), and students who live in poverty. In a survey conducted by the National Center for Education Statistics (NCES; USDE, 2008) only 32% of in-service educators felt they were adequately prepared to teach the different types of students in their classrooms. Data collected in 1998 and 2000 (NCES; USDE, 2008) also indicated an 8% increase in the number of educators who felt under-prepared to teach students with disabilities, growing from 71% to 79%, respectively.

The design of teacher preparation influences the experiences of early career teachers (Zeichner, Melnick, & Gomez, 1996). Outcome differences are identified between universities holding on to "structural and conceptual fragmentation of traditional undergraduate teacher education programs" and universities upgrading programs with features of "tight coherence and integration among courses and between course work and clinical work" (Darling-Hammond, 2006a, p. 7). Preservice education is informed through teacher educators' dispositions toward, expertise in, and experience with diverse student populations (Guo, Arthur, & Lund, 2009). Some teacher educators spend little time incorporating diversity curricula in coursework for many of the same reasons K-12 teachers historically struggle in meeting the needs of students from diverse populations. Teacher educators, like their K-12 protégées, are a homogenous society. As an older generation, many attended schools with less diversity and at a time when deficit views of difference were common. Their own preservice education included little, if any, discussion of diversity and their career in the K-12 setting may have served fewer students identified as diverse.

Research on preparation that improves teacher retention and student achievement identifies improving coursework and increasing time and quality of clinical experiences to better prepare teacher candidates who are ready to meet the needs of all students (Darling-Hammond, 2006b; West & Hudson, 2010). Those who have accepted the challenge of restructuring teacher education to increase teacher and student outcomes show results that "produce novice teachers who are able, from their first days in the classroom, to practice like many seasoned veterans, productively organizing classrooms that teach challenging content to very diverse learners with levels of skill many teachers never attain" (Darling-Hammond, 2006b, p. 7).

Transforming traditional coursework to effectively address diversity is known to increase teacher retention and improve student achievement; yet, such change has not kept up with the rapid growth of diversity in today's schools (Darling-Hammond, 2000b). One survey course in special education was added to undergraduate requirements at many colleges of education (COEs) in the 1970s when inclusion of students with disabilities was first being realized. This single course may have been adequate for future teachers 40 years ago, but is surely not enough for today's inclusive classrooms (Smith, Polloway, Patton, & Dowdy, 2008).

Debates between content and pedagogy are ongoing between COE and college of arts and sciences faculty who partner in preparing secondary education teachers (Brantley-Dias, Calandra, Harmon, & Shoffner, 2006). Requirements for completing teaching degrees in elementary and secondary education often vary in the amount and types of coursework and clinical experience. These departmental divides create disconnect between theory and practice (Darling-Hammond, 2006a). Studies illustrate that secondary education content majors have lower in-service retention rates than those who graduate with elementary education degrees (Scherff & Hahs-Vaughn, 2008), leading to a belief that secondary education majors need more understanding of teaching and learning prior to entering the profession.

Opportunities for preservice teachers to apply theory in practice through field experience and student teaching is also noted as problematic (Boyd et al., 2007; Zeichner, 2010). Working with students considered diverse can alleviate assumptions preservice teachers hold and develop confidence in their skills in working with students who are unlike themselves (Gomez, Strage, Knutson-Miller, & Garcia-Nevarez, 2009). Increased hours in the field must also be accompanied by opportunities to interact with all types of students to develop necessary dispositions as well as knowledge and skills in areas such as assessment, collaboration, and intervention planning (Darling-Hammond, 2006a). Hours spent in the field are another area of disparity between secondary and elementary teacher preparation programs. When compared to elementary education majors, secondary content majors experience less field experience requirements (Blackwell, 2002). Blackwell (2002) suggests an increase in hours of structured field experience for secondary majors, embedded in content pedagogy and/or through content courses.

Amidst the aforementioned concerns in teacher preparation are problems in evaluating the degree in which preparation impacts teacher outcomes. Citing an exhaustive review on teacher education efficacy, prior to their own study on preparation pathways, Good, et al. (2006), concluded, "Very little is known about if and how teacher education affects practice" (p. 411). Though some universities use exit interviews and post-graduation surveys to attain useful data of graduate perceptions and, at times, career outcomes, such measures can be misleading if certain variables are not considered in the data collection and/or analysis process. Colleges of Education (COEs) may miss valuable insight if information is neglected regarding candidate entry skills, background, and in-service demographics. Paying attention to alumni perceptions of preservice training and post-graduation outcomes provides insight to those seeking to impact teacher retention and student achievement. Some COEs addressing teacher preparation concerns report positive results in retaining early career teachers by revamping programs, emphasizing culturally responsive teaching practices (Brayton, 2008). Though few in number, such studies are promising and warrant consideration (Darling-Hammond, 2010).

To better understand why an early career teacher leaves the profession requires examination of the individual's past, present, and future. After teachers spend time fully employed in the classroom, reflection on preservice training and in-service experiences, as well as intention of career longevity, could provide insight to COEs focused on preparing competent teachers who meet the needs of all students, including those from diverse backgrounds. As important as it is to heed input from those employed as teachers, the voices of those leaving teaching within the induction period and those not entering the profession at all could also be revealing. A dearth of research exists examining variance in programs of study in teacher preparation. It seems intuitive that disaggregating data by degree paths would be revealing. Different programs of study (e.g., elementary education degree, secondary education degree) may have varied requirements including the amount and types of coursework, hours of field experience, and length and components of student teaching. Whether or not the graduate concurrently completes a minor degree or second teaching field could also give insight to how prepared a teacher is for the classroom. This would necessitate noting differences in the outcomes of graduates with no minor, a minor related to working with diverse student populations (e.g., English speakers of other languages [ESL] minor, special education minor), or a minor in another field. The closer scrutiny of degree paths could shed light on why teachers feel unprepared to work with students from diverse populations and become part of attrition statistics.

Method

Concerns regarding early career teacher attrition attributed to preservice preparation motivated this mixed methods case study which examined, via a survey design, the degree to which teacher preparation impacts post-graduation outcomes, particularly career retention. To accomplish this, the study explored variables identified from teacher attrition research: coursework and clinical practice (both field experience and student teaching). Targeted variables included coursework adequacy, hours of field experience, and length of the professional semester. Since much of the literature on teacher attrition includes concerns of effectively teaching students from culturally and linguistically diverse (CLD) populations, this topic was also explored. The idea that education majors who successfully complete more coursework and clinical perceive themselves as better prepared by their preservice programs, feel more effective in the classroom, and plan to remain in the teaching profession beyond the induction period was also explored.

Participants

Personal, educational, and professional demographics, perceptions of preservice preparation, and post-graduation outcomes from a purposeful sample of graduates at a university in the Midwest were analyzed. A unique feature of the research was the examination of participants' degree paths and additional endorsements received. Participants were 3 to 5 years post-graduation. The professional retention was increased for graduates completing programs of study with more emphasis on diversity. Determining which graduates received more emphasis on diverse populations was achieved by disaggregating data among 9 programs of study: Elementary/no minor, elementary/diversity minor, elementary/general minor; K-12, no minor, K-12/diversity minor, K-12/general minor; secondary/no minor, secondary/diversity minor, secondary/general minor.

In addition to an initial education foundations course, all programs of study required successful completion of a 3-hour survey course in special education and 9 hours of psychology, but elementary majors were also required additional credits in classroom management and multicultural studies. Pedagogy-related coursework also varied among different secondary content areas. For example, the BSEd in biology required one 3-hour methods course for teaching biology while the BSEd in technology education required 10 hours of content teaching methods.

Differences in the length of field experiences were also noted among the programs of study, ranging from 10 to 271 hours in-field during the timeframe the participants were attending. All degrees, except one, required successful completion of 33 observation hours in their initial education course. Each program required a diversity-related field experience organized through the special education survey course. Other field experience requirements varied depending upon the degree and whether the candidate was completing a minor degree. For example, 45 hours in-field for reading practicum were required of elementary education majors, while a student accompanying his degree with a minor in special education completed 150 hours under the direction of a university supervisor and fully licensed special education teacher.

Upon completion of course requirements, students applied for student teaching. All programs required a single semester of student teaching, but an optional two semester internship was available to elementary candidates who volunteered and were selected for participation.

Results

Attrition

The participants in this study felt positive about their preservice preparation in spite of their varying paths to graduation. The sample's attrition rate was 13.16%, less than half of what is noted by other studies on early career teacher attrition (Ingersoll & Smith, 2004). The majority of participants (~87%) were employed as teachers at the time they completed the survey and 94% of this group intended to remain so beyond the induction period, including all of the elementary and K-12 responders. Eighty-seven percent of elementary teachers predicted an intent of 10 or more years of service, while 92% of the K-12 teachers predicted such a commitment. Secondary education teachers were the only group planning a shorter obligation with 17% predicting to not teach beyond induction. One particular statistical test did find the average number of intended teaching years significantly less for secondary education majors who earned general minor degrees compared to elementary education majors earning diversity minors, but this was confounded by another result showing a significant difference among secondary education majors compared to elementary majors who earned no minor degrees at all. These results, however, indicated a small effect.

Research on high poverty rural schools also indicates higher attrition numbers (Ingersoll, 2001), yet this sample, who primarily spent their time in high poverty (~67% low SES) rural areas (~58%), largely remained in teaching. Even so, of those leaving teaching, most did so after spending time in rural (67% of leavers), high poverty (73% of leavers) schools.

Coursework

Since there were considerable differences among course and field requirements, it was predicted differences would also be noted among participant responses to the survey, thus supporting research focused on attrition attributed to preservice coursework and clinical experience factors. Analysis of the data, however, indicated this to not be the case. Statistical tests found no significant differences among programs of study and preparation perceptions. Most participants felt prepared to teach, entered and remained in teaching, and felt effective in the classroom. Though participants held positive perceptions of coursework adequacy, an additional survey question allowed them to specify areas they felt needed more emphasis before teachers enter classrooms. Coursework focused on diverse populations was identified as the greatest area of need by 62% of the respondents while more instruction in classroom management was identified by almost 60% of the respondents.

Field Experience

Concerns are noted by Boyd, et al. (2007), of field experience inconsistencies within education programs. Participants indicated differences in the number of field hours required prior to student teaching. This sample collectively, however, believed their field experiences were effective (82.75%). Almost 80% felt the number of hours were adequate, though in a follow-up open-ended question, 60% of responders suggested increasing time in-field.

Though it is unknown how the numbers of field hours compare with teaching universities across the nation, it is known that the fieldwork of all program areas at the university were embedded in specific courses as opposed to standalone field experiences that follow the completion of particular courses. Some felt certain elements from college coursework could be improved to enhance field experiences. One respondent shared, "I felt like the ideas and methods I was given for discipline in coursework were for perfect situations and ideal circumstances rather than the reality of students who curse at you, threaten you, accuse you of racism, etc." Such sentiment supports Guo et al. (2009) conclusion that preservice teachers want opportunities to apply what they are learning in the college classroom in true settings.

The most identified area of field experience dissatisfaction (55%) focused on opportunities respondents had in working with students of diverse backgrounds. In a follow-up open-ended question, 35.29% indicated need for more time working with students from diverse populations, specifically those from "urban settings," "different cultures," "students with disabilities," "different socioeconomic cultures," "disabilities," and "ELL."

Student Teaching

In regard to student teaching, this study looked at one particular area cited in the research as beneficial to future teachers—yearlong internships—as well as asking respondents to voice ways the student teaching experience could be improved. The majority of the sample (86%) completed a traditional single student teaching semester. The yearlong internship was available only to elementary education majors who met particular criteria. A follow-up question asked the sample what they felt was most appropriate in terms of preparing a teacher candidate and the majority (64%) believed one semester was most appropriate. Further thoughts on student teaching, however, were shared in an additional open-ended question answered by 34% of the respondents who discussed a variety of topics from the need for master cooperating teachers to financial concerns of the student teacher. Some responding to the open-ended question stressed benefits of the internship:

[Internship Graduate]: I believe having the opportunity to do a year long of student teaching prepared me better for my own teaching position. Compared to other 1st year teachers, I was more prepared.

[Internship Graduate]: Encourage more students to complete internship because it builds greater rapport with students, continuity in teaching the curriculum, and a better "feel" for how teaching really goes.

[Single Semester Graduate]: I believe it would be more beneficial for all students to be required to do two full semesters in student teaching. This would better prepare the student teachers for teaching. I believed that my student teaching was the more educational thing I did during college. I truly wish I would have done an internship. I believe my first year would have gone much better if I had.

Discussion

The educational route taken to enter the teaching profession makes a difference in classroom effectiveness and career longevity (Darling-Hammond, 2006a). Intuition would lead one to believe that more practice at a skill indeed results in greater skill attainment. Related to this study, it would seem those who received more education-related coursework and more hours of clinical practice, especially focused on populations of high need, would realize better career outcomes. The programs of study this research examined showed great variance in the number of education courses required and hours spent in the field working with students in general and with students from diverse populations, particularly. It seems counterintuitive that there is little difference between the outcomes of someone who spent over 200 hours in classrooms working with greater numbers of students with high needs compared to another who spent only 43 hours working with a more homogeneous group of students. For this case study, the graduates—even those who left teaching and who never started—perceived their education as adequately preparatory. (Note: Respondents indicating they never entered teaching after their degrees were conferred completed survey questions about this decision. None of the respondents indicated inadequate preparation for teaching; all provided other reasons for taking different career paths after graduation. Some of the reasons given for not entering teaching included raising a family, health problems, and no openings available.) What is it, then, that compelled the participants in this study to maintain fairly similar feelings about their preservice experiences and their postgraduation outcomes, even though their paths to the classroom differed?

Perhaps an answer is hidden within Cochran-Smith's (2008) theory of social justice in teacher education and other research focusing on the social and cultural contexts of schooling. This theory, integrating theories for social justice, teaching practice, and teacher preparation, promotes equity, recognition, and respect for all social, racial, and cultural groups. It views teachers as "potential agents of social change...[who] can influence students' learning and life chances" (p. 16) and views teacher education as the source for future teachers "to learn about subject matter, pedagogy, culture, language, the social and cultural contexts of schooling, and the purposes of education" (p. 21). Closer examination of the demographics of the participants as well as the students they teach, the teacher educators, and similarities instead of differences among the programs of study, could provide more insight.

Research indicates some of the problems with early career attrition is the disconnect between the backgrounds of students and their teachers ("A High Quality Teacher," 2000). A majority of the study sample were employed in high poverty rural schools and most indicated working with students from diverse populations, yet research indicates that schools filled with such diversity can be overwhelming to teachers who are working with students who differ in culture and who live in isolated areas (Griffin et al., 2003; Mastropieri, 2001). The university in which the study took place is situated in a large region where the majority of public schools are rural and have low SES. Though this data was not collected, perhaps most participants were from the region and took on teaching positions at low SES rural schools. This could mean that as children themselves, they grew up in schools primarily rural and poor. This aspect of familiarity, having similar backgrounds as their students, possibly impacted the career outcomes of the respondents.

Another area of cultural familiarity regards the participants own K-12 schooling. The majority were between the ages of 25 and 35 years. The graduates of this study, as children, probably attended schools where children with disabilities were included in general education. Over the years, the student population has changed in response to school and civil rights litigation and legislation. It is likely the participants attended schools filled with students from all types of backgrounds and that inclusive education was the norm rather than the unique (Smith et al., 2008). For such participants, sitting in classrooms alongside peers with disabilities and other types of differences was not atypical.

A closer look at the backgrounds of the university's teacher educators might reveal a staff with expertise and experience that encouraged more infusion of theory and methods for effectively teaching students from diverse backgrounds throughout all or most of the education courses taught (Guo et al., 2009). Teacher educators, who may have expertise of and participation with a variety of CLD populations, appear more motivated to weave needed diversity topics into the curriculum throughout the semester (Guo et al., 2009). Such curriculum infusion or integration takes place when "content that is typically presented through a standalone course is instead infused or integrated across multiple or all courses within a particular program" (Sands, Duffield, & Parsons, 2006, p. 92). This concept leads to greater consistency among different program areas, fades departmental divides, and demonstrates cross-curricular collaboration useful to preservice majors. Assessing such practices is difficult, but emerging literature indicates promise (Sands et al., 2006) and would perhaps shed light to the results of this study.

Since nothing remarkable was noted among the different programs of study, similarities among participant paths to degree completion were scrutinized revealing one element each graduate had in common: completion of a particular field experience placing preservice teachers directly working with one or more K-12 students coming from backgrounds considered diverse. These opportunities occurred under the supervision of classroom teachers and required university students to work with individual or small groups of students coming from backgrounds identified as diverse. Different outcomes result when preservice teachers are assigned field experiences in classrooms where diversity is prevalent. In such classrooms, preservice teachers proclaim "they developed intercultural competence through their practical experiences" (Guo et al., 2009, p. 573). Working with students considered diverse can alleviate assumptions preservice teachers hold and develop confidence in their skills in working with students who are unlike themselves (Gomez et al., 2009). The results of this study should encourage a further look into the value such field experience adds to the retention of early career teachers.

For this case, the participants—even those who left teaching and who never started perceived their education as adequately preparatory; most entering the profession plan to stay. Teachers who feel good about their preparation tend to have positive feelings about their classroom effectiveness and intend to remain in teaching beyond the induction period (Darling-Hammond, 2006b; McLeskey & Billingsley, 2008). Reaching this career milestone is known to increase student achievement, self-efficacy, and career longevity (Griffin, et al., 2003). All public school students, their families, and communities should be guaranteed teachers qualified for the positions in which they are hired. Such assurance is the responsibility of not only the states licensing educators and the school districts hiring them, but also the universities preparing them for their professions. It seems obvious these three entities would benefit from working together, addressing factors relating to teacher attrition. Those who work most directly with preparation and research--teacher educators—should lead the way.

About the Author

Dr. Flynn is a 34-year veteran educator with 24 years high school teaching experience prior to her current work as an Assistant Professor in teacher education at Pittsburg State University (Kansas). In addition to teaching, she also serves as the director of the PSU Center for the Study of Poverty and Student Achievement and holds research interests in teacher preparation, inclusive education, and student resiliency.



References

- A high-quality teacher for every classroom (2002). *SPeNSE Study Sheet*. Retrieved June 11, 2009, from www.spense.org.
- Blackwell, P. (2002). *Putting the pieces of teacher education together: Lessons learned by the Eisenhower Initial Teacher Professional Development Programs.* Paper presented at the Annual Meeting of Educational Research Association, New Orleans, LA.
- Boyd, D., Lankford, H., Loeb, S., Rockoff, J., & Wyckoff, J. (2007). The narrowing gap in New York City teacher qualifications and its implications for student achievement in high-poverty schools. Washington, DC: National Center for the Analysis of Longitudinal Data in Education Research.
- Boe, E. E., Cook, L. H., & Sunderland, R. J. (2007). Teacher turnover in special education: Attrition, teaching area transfer, and school migration. (Research Report No. 2006-TSDQ3). Philadelphia, PA: University of Pennsylvania, Center for Research and Evaluation in Social Policy.
- Brantley-Dias, L., Calandra, B., Harmon, S. W., & Shoffner, M. B. (2006). An analysis of collaboration between colleges of education and arts and sciences in PT3. *TechTrends: Linking Research and Practice to Improve Learning*, 50(3), 32-37.

- Brayton, J. (2008). Using mentoring and cohort collaboration: Enhancing teacher quality in preservice teachers. *The Delta Kappa Gamma Bulletin*, 74(3), 35-38.
- Cochran-Smith, M. (2008). Toward a theory of teacher education for social justice. Paper presented at the Annual Meeting of the *American Educational Research Association*, New York City.
- Darling-Hammond, L. (2006a). Constructing 21st-Century teacher education. *Journal of Teacher Education* 57(3), 300-313.
- Darling-Hammond, L. (2006b). *Powerful teacher education: Lessons from exemplary* programs. San Francisco: Jossey-Bass.
- Darling-Hammond, L. (2010). Teacher education and the American future. *Journal* of Teacher Education, 61(1-2), 35-47.
- Gomez, S., Strage, A., Knutson-Miller, K., & Garcia-Nevarez, A. (2009). Meeting the need for K-8 teachers for classrooms with culturally and linguistically diverse students: The promise and challenge of early field experiences. *Teacher Education Quarterly*, 119-139.
- Good, T. L., McCaslin, M., Tsang, H. Y., Zhang, J., Wiley, C. R. H., Bozack, A. R., & Hester, W. (2006). How well do 1st year teachers teach: Does type of preparation make a difference? *Journal of Teacher Education*, *57*(4), 410-430.
- Griffin, C. C., Winn, J. A., Otis-Wilborn, A., & Kilgore, K. L. (2003). New teacher induction in special education. (COPSSE Document Number RS-5E).
- Guo, Y., Arthur, N., & Lund, D. (2009). Intercultural inquiry with pre-service teachers. *Intercultural Education*, 20(6), 565-577.
- Ingersoll, R. M., & Smith, T. M. (2004). Do teacher induction and mentoring matter? *NASSP Bulletin, 88*(638), 28-39.
- Mastropieri, M. A. (2001). Is the glass half full or half empty? Challenges encountered by first-year special education teachers. *The Journal of Special Education*, *35*(2), 66-74.
- McLeskey, J., & Billingsley, B. S. (2008). How does the quality and stability of the teaching force influence the research-to-practice gap? *Remedial and Special Education*, 29(5), 293-305.
- Sands, D. I., Duffield, J. A., & Parsons, B. A. (2006). Evaluating infused content in a merged special education and general education teacher preparation program. *Action in Teacher Education*, 28(4), 92-103.

- Scherff, L., & Hahs-Vaughn, D. L. (2008). Beginning English teacher attrition, mobility, and retention. *Journal of Experimental Education*, 77(1), 21-54.
- Smith, T. E. C., Polloway, E. A., Patton, J. R., & Dowdy, C. A. (2008). Teaching Students with Special Needs in Inclusive Settings. 5th Ed. Boston: Pearson Education, Inc.
- U. S. Department of Education, National Center for Education Statistics. (2008). *Attrition of Public School Mathematics and Science Teachers*. Washington, DC: Author.
- West, E. A., & Hudson, R. F. (2010). Using early career special educators voice to influence initial teacher education. *International Journal of Whole Schooling*, 6(1), 63-74.
- Zeichner, K. (2010). Rethinking the connections between campus courses and field experiences in college and university-based teacher education. *Journal of Teacher Education*, 61(1-2), 89-99.
- Zeichner, K., Melnick, S., & Gomez, M. L., (1996). Currents of reform in preservice education. New York: Teachers' College Press.