Culturally Responsive Teaching: Awareness and Professional Growth through a School-University Collaboration

Theresa M. McCormick, Auburn University
Charles J. Eick, Auburn University
Janet S. Womack, Florence City Schools

ABSTRACT: Preparing in-service and pre-service teachers to effectively work with culturally diverse students is an ongoing challenge for schools and universities alike. This article reports on a University-Professional Development School (PDS) initiative designed to enhance an awareness of culturally responsive pedagogy. This article describes a yearlong professional development partnership entitled Project REACH (Reclaiming Educators' and Children's Hope). Two hundred seventy teachers in grades K – 5 and 49 elementary interns participated in book study groups, attended a presentation given by the author of the book, and met periodically to discuss awareness and practices relating to teaching diverse students. Data generated from this project were collected from online open-ended survey responses. Results suggest that critical reflection and practical application work together in practice to begin to effect meaningful change in pre-service and in-service teachers' thinking and skills when teaching diverse students.

NAPDS Essential(s) Addressed: #1/A comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community; #2/A school–university culture committed to the preparation of future educators that embraces their active engagement in the school community; #4/A shared commitment to innovative and reflective practice by all participants; #7/A structure that allows all participants a forum for ongoing governance, reflection, and collaboration; #8/ Work by college/university faculty and P–12 faculty in formal roles across institutional settings

Introduction

Most teachers and administrators across the country will concur with the recent U.S. census findings and reports, K - 12 classrooms are becoming increasingly diverse (U.S. Census, 2010). Despite this trend, however, the overall demographics of elementary classroom teachers have changed little, with most teachers being white, English speaking, mid-

dle class, and female. The National Center for Education Statistics highlights the growing cultural disparity between public school teachers and their students. In the *Characteristics of Full-Time Teachers* report, 83 percent of all full time teachers are white (The Condition of Education, 2012). However, from 2000 – 01 to 2007 – 08, the proportion of public school enrollment shifted within racial and ethnic groups with 44 percent of U.S. public school students being minorities (National Center for Education Statistics, 2010). Therefore, many pre-service and in-service teachers may have limited knowledge and experiences in how best address the needs of the cultural characteristics or communication patterns of diverse learners through culturally responsive teaching (Howard, 2003; Knight & Wiseman, 2005). For the purposes of this study, culturally responsive teaching is defined as using the cultural characteristics, experiences, and perspectives of ethnically diverse students as a foundation for teaching more effectively (Gay, 2002).

With the inception of No Child Left Behind (NCLB) in 2001 along with the new state accountability system in 2004, school districts have been required to demonstrate that all students meet adequate yearly progress (AYP). The current accountability system focuses on the success of all students and measures achievement of each student by population groups. However, state and regional AYP analyses indicate that the students who most often fail to meet acceptable AYP progress are Black, Hispanic, Special Education students, and/or students receiving free or reduced lunches. Schools and districts that have previously met AYP have found themselves failing to demonstrate proficiency due to increasing proficiency requirements each year with a goal of 100% of all population groups meeting proficiency in all areas by 2014 (NCLB).

Subsequently, schools and districts are challenged to address any gaps in achievement in all their students, rather than just the average or high achieving students. Inadequate achievements among populations of students have awakened school districts to a reality that quality schools transcend the number of AP scholars or the affluent status of a community or district. Quality schools and teacher preparations programs ensure that all students achieve to the greatest extent possible. As the next generation of teachers is prepared, colleges of education are responsible for preparing pre-service teachers who demonstrate culturally responsive teaching practices. Teacher education programs and school systems alike are exploring ways to provide effective professional development experiences with the goal of developing the expertise of teachers to meet the needs of the students in today's 21st century classroom with a focus on ensuring that all students succeed at equitable levels.

This article describes a yearlong university-school system partnership project titled Project REACH (Reclaiming Educators' and Children's Hope) that was coupled with an empirical research study to examine how this professional development project influenced in-service and pre-service teachers' expertise in working with culturally diverse students. This project reflects a joint effort between the Elementary Education program in the Department of Curriculum and Teaching at Southeastern State University, the State professional development In-Service Center, and the Plains City School System to increase awareness and expertise in culturally responsive pedagogy. Elementary teachers, at their school sites and elementary student teachers, in a seminar course, participated in small book study groups centered on reading and reflecting on a selected book (Kuykendall, 2004). This book study concluded prior to a presentation given by Dr. Kuykendall where she gave a personal testimony of her life as an at-risk student of color. At the end of the study teachers and interns responded to questions about the impact of the book study on their thinking about diversity and cultur-

ally responsive teaching as well as possible influence on their practice. Unlike other forms of collaborative, participatory evaluation, our empowering approach had the expressed goals of organizational improvement in helping current and future teachers reach all students (Fetterman & Wandersman, 2005).

Through this unique educational network, Project REACH was developed after stakeholders examined the strategic plans of both Plains City Schools and Southeastern State's College of Education and the recently adopted State Quality Teaching Standards. The fourth standard, diversity, sets standards to improve the learning of all students, teachers, with an emphasis on differentiated instruction that exhibits a deep understanding of how cultural, ethnic, and social background; second language learning; special needs; exceptionalities; and learning styles affect student motivation, cognitive processing, and academic performance. Similarly, the fourth National Council for Accreditation of Teacher Education (NCATE) supports teacher preparation programs that provide learning experiences that allow teacher candidates to demonstrate and apply proficiencies related to diversity through knowledge, skills, and dispositions. Therefore, Project REACH, through a unique university-school partnership, specifically sought to provide professional development for both in-service and pre-service teachers in an effort to facilitate appropriate decision making about teaching culturally diverse students through (a) self awareness, (b) knowledge, (c) and reflection on practice. Specifically, this study was guided by the following research question, "How did in-service and pre-service teachers ascribe their awareness of culturally responsive teaching after their participation in Project REACH?"

Literature Review

There are many school factors that affect the success of culturally diverse students, such as the school's atmosphere and staff's and overall attitudes toward diversity, involvement of the community, a culturally responsive curriculum, and the classroom teacher (Sleeter & Grant, 1999). Of all of these factors, the personal and academic relationship between teachers and their students may be the most influential. Previous studies indicate that teachers who are sensitive to societal challenges students face because of their race, class, gender, language, religion, or ability are more effective in providing learning experiences that will meet these students' needs (Bennett, 1995; Burstein & Cabello, 1989; Ladson-Billings, 1995; Sleeter, 1995). Vaughan (2004) suggests that "teachers' attitudes toward cultural diversity is an indication of how culturally responsive they will be in the classrooms" (p. 45). However, teachers may lack the awareness of how personal dispositions influence their practice and may unknowingly and unintentionally marginalize some students (Ballinger, 1992; Contreras & Less, 1990; Jordan, 1985; Powell, 1997). Therefore, professional development that addresses the mismatch between teachers' attitudes and beliefs about teaching culturally diverse students and their practices is important for the success of school reform and efforts to improve the educational achievement of all students (Elmore, 2002).

Teachers-as-readers study groups, or book clubs, for both in-service and pre-service teachers has gained attention as a form of professional development in the last few years (Chevalier & Houser, 1997; Clark, 2001; Keller, 2008, Kooy, 2006; Smith & Strickland, 2001, White-Hood, 2007). Book study groups are often structured as informal, peer-led discussion groups that meet regularly to discuss a mutually selected text focusing on some aspect of teaching (Kooy). Since pre-service and in-service teachers rarely have opportunities to experience a sustained exploration of complex ideas, book study groups facilitate self-directed in-service and pre-service teacher learning within a social context

over an extended length of time (Raphael, et al., 2001). In addition, the context of the book club provides opportunities for critical discourse, self-reflection, and meaningful opportunities for professional growth (Smith & Strickland). Using a common text, in-service and pre-service teachers explore their insights about universal qualities among people, cultural values, and social issues through thought provoking discourse and reflection (Harlin, Murray, & Shea, 2007). The National Staff Development Council (NSDC) advocates the teacher led learning communities and advocates the use of book studies to promote deeper understanding of concepts that will transfer into classroom practice (Desimone, 2009).

Method

The goals of this study were (a) to examine pre-service and in-service teachers' impressions regarding their participation in Project REACH, (b) to better understand how these professional development experiences related to their understanding of meeting the needs of culturally diverse students, and (c) to determine implications for K-6 classroom instruction.

Participants and context. Two hundred seventy teachers in grades K-5 in the Plains City School District participated in Project REACH. Demographics of participants by ethnicity included 235 Caucasian, 33 Black, and two other teachers. Two hundred forty-six were female and 24 were male. The partnership's current focus is to strengthen communication, partnership programming, data dissemination, and stakeholder involvement. Plains City Schools serves approximately 6,000 students in grades K-12 with 28% minority students and 25% of students at the federal poverty level. With the close proximity to the university and the increasing presence of an international automobile industry, Plains is rapidly becoming a more culturally diverse community. Presently, the school district serves students from 42 different native languages and cultural backgrounds. The uniqueness of the system-wide partnership provides extended opportunities that foster systemic change to maximize student and teacher success, including embracing over 150 college interns and 900 lab placements during the 2007–2008 school year in the district's ten schools.

Teachers in all schools were provided with a book study guide developed as an extension of materials provided by the author. The guide was divided by chapters and included questions that connected content in the chapter to personal experiences, teaching beliefs and teaching practices. Additional questions were designed to facilitate conversations within the study groups and to stimulate reflections on current teaching practices.

Each school established a timeline for book study discussions within the framework of the November to January district-wide timeline. Discussions were enhanced in many schools through technology via blogging. For example, one school heavily involved in the 21st Century Technology Initiative, integrated their book study into their current delivery and exchange model—through technology. School faculty posted reflections and questions via the Project REACH blog in addition to their face-to-face conversations in grade-level and school-wide faculty meetings. Book study face-to-face meetings were held weekly through small group grade level meetings facilitated by grade level chairs and through large group faculty meetings facilitated by school principals.

The Elementary Education program has a strong presence in all five of the elementary schools that follow the Professional Development School (PDS) model (Holmes Group, 1986, 1995). For the purposes of this study, only pre-service teachers who were placed in PDS schools participating in Project Reach were included. During this semester, forty-nine elementary education major pre-service teachers were doing their final semester (15 weeks) of internship. In addition to their internship, they completed a non-graded professional development seminar course that met weekly in

alternating face-to-face and asynchronous online discussion meetings. All of the forty-nine teacher candidates were Caucasian with one male. The intent of the seminar course taken during student teaching was to focus on professional development that pre-service teachers needed as practicing interns. In this regard, discussion of case-based scenarios of challenges faced by student teachers was a big focus of the meetings and the threaded discussion board. The discussion board also facilitated the exchange of ideas and supportive feedback needed by teacher candidates throughout their semester long internship.

Concurrently, during the first half of the spring seminar course, the pre-service teachers completed their book study groups in parallel with the participating elementary teachers at the PDS schools. They were assigned a few sequential chapters to read each week while using guiding reflection questions the same as those used by the classroom teachers. Pre-service teachers were also required to electronically post their reflective thoughts to a discussion board journal on a weekly basis for each chapter read. These journals focused on any aspect of their reflective notes from the guiding questions that were most poignant or meaningful to them. Journals were typically substantial paragraphs on each chapter. The course instructor monitored student thinking in their reflective journals, but did not reply to them in order to avoid 'safe' responses by the student teachers. Upon completion of reading the book at the mid-point of the semester, the student teachers and the classroom teachers attended Dr. Kuyken-dall's talk on her personal story and the need for culturally relevant pedagogical strategies. After-wards, the interns responded to a set of questions in their electronic journals about the impact that the book study had on their thinking and practice. Thirty-one of them consented to allow use of their electronic journal reflections for this study.

Data collection and analysis. For the purpose of this study, qualitative data were collected from consented in-service and pre-service teach-ers from a their written responses to the

following question, "How did your participation in Project REACH impact your perceptions in regard to meeting the needs of culturally diverse students?". For the purposes of this investiga-tion, qualitative responses from open-ended survey items relating to the book study were analyzed using the grounded theory methodol-ogy and categorized according to the research questions and coded independently by the three researchers using a constant-comparative meth-od to find themes among the data (Corbin & Strauss, 2008; Glasser & Strauss, 1967). Each of the three researchers coded all data with the question and theme identifier, and results were compared. All efforts were made to minimize the imposition of researcher bias during the analysis process and to view the data as closely to the intended meanings as possible. If any disagreement to category placement or meaning of comment was present, we discussed it and, if any further disagreement existed, the comment was not used. As the responses were analyzed, several themes emerged from the data. We categorized each comment according to the theme with which each was most closely aligned. The following theme identifiers were used: (a) student perceptions, (b) positive and nurturing classroom environment, and (c) relationships with parents.

Results and Discussion

Data were analyzed for each group of participants, teachers and pre-service teachers, in search of changes in thinking about culturally responsive teaching. In particular, differences between experienced teachers' thinking and pre-service teachers' thinking were highlighted to better understand this book study's influence on teachers at both ends of the professional teacher continuum. Data were used to make the case that meaningful change in teacher thinking did improve from the systematic and sustained professional development Project REACH provided.

The first research question that guided this study was, "How did in-service and pre-service teachers ascribe their awareness of culturally responsive teaching after their participation in Project REACH?" The pre-service teachers thought about how their attitudes and body language could make a big difference in how they were perceived by their culturally diverse students and how diversity influences students' perceptions. They wanted to portray positive attitudes such as praise and encouragement, which would motivate their students to achieve at higher levels. In their relationships with diverse students, who are often challenged in the mainstream classroom, they sought to intentionally give students a better chance and instill hope for success. One teacher candidate articulated that she especially wanted to inspire these students to achieve their best and planned to do so by, "building a sense of community in my classroom." Other teacher candidate frequently mentioned patience, respect, and caring for all of their students in an effort to build a classroom community made up of all students. Many echoed these feelings by voicing how all students must feel accepted and their individual differences should be embraced as an important part of the classroom culture. One teacher candidate wrote:

> By recognizing that classrooms are diverse (different races, religions, learners, etc.) and embracing that diversity, students will feel as if they are more a part of a family than stuck in a classroom where they don't want to be.

Recognizing the critical role that a teacher has in establishing a classroom culture that respects and embraces student diversity, another intern commented:

> . . . the first day of school I will ask the students to think about something that is very diverse or different. This could be a talent or a personality trait.

Each student will then share this with the class to show that everyone is different, but we welcome and celebrate these differences.

As their internship proceeded, the pre-service teachers emphasized strategies for teaching that met the diverse learning styles of the students in their classroom. They were very cognizant of how their approach to teaching needed to be congruent with the learning styles of their students. They particularly saw the need to make learning in the classroom more fun, interactive, and even playful. They also saw the need to set goals for individual learners often based on their rate of learning.

In addition, the pre-service teachers described being more aware of the various outside of school factors that impact children's behavior and performance in their classroom, particularly their students of color. This awareness, they believed, helped them to begin developing empathy for students and affected how they addressed difficulties that arose in the classroom during their internship. These pre-service teachers often spoke of thinking first about their students' lives before making decisions as their teacher. Teacher candidates wanted their students to have a chance to dialogue about problems instead of being punished for outward behavior.

Classroom teachers echoed the sentiments of their elementary education pre-service teachers in the areas of positive attitude, respect, empathy, believing that all students can achieve, and connecting with each child's learning style for his/her individual success. Teachers, however felt the need to consider and better understand the culture of students in their teaching much more than pre-service teachers. The teachers saw their roles as teachers as needing to discover this potential in the strengths and talents of their students before they could better reach them.

Although classroom teachers, similar to the pre-service teachers, reflected upon the many outside factors impacting student be-

havior and performance they also thought more about parents of students. Many of the pre-service teachers expressed a new realization that all parents needed to be treated with respect and to appreciate that the parents loved their children and wanted the best for them. The classroom teachers, on the other hand, felt the need to begin reaching out to the parents that they had previously easily dismissed as "unreachable" before. Rather than clinging to the old thought, "parents don't care," veteran teachers commented that for the first time, they were more aware that parents' lack of involvement may be due in part to them feeling uncomfortable or intimidated by teachers and administrators due to the previous negative experiences. One teacher revealed, "I had not thought about a parent being embarrassed to come to school." Another teacher explained, "It is important for educators to make the first contact with parents a positive one. Parents may harbor negative memories from their own experiences in the school. I had never really considered that before."

In addition, teachers began to recognize that oftentimes parents lack the skills to know how to assist their children in being successful in school. Within their groups they began to explore ways to reach out to parents. One teacher suggested, "Many parents are unsure of their responsibilities when it comes to their child's education. Schools need to develop a parent education program/center to educate [parents] them on how to help in the success of their children."

Conclusions and Implications

Our purpose in this study was to evaluate and report the effect Project REACH had on participating teachers' and the pre-service teachers' awareness of culturally responsive teaching. The research revealed that this systematic and sustained professional development provided opportunities for meaningful professional growth for both in-service and pre-

service teachers. We suggest that there are three tenets that led to this change. First, the active participation of both in-service and pre-service teachers within their small book clubs was paramount. Rather that attending a workshop where experts tell teachers what they need to be doing in the classrooms, these teachers developed their own expertise during their weekly meetings. Similarly, the pre-service teachers were not constrained to a university course with little or no connection to practice. Within their internship placement, they could more readily connect theory to practice by applying what they were reading and discussing in their seminar class and with their cooperating teacher at the PDS site to real world classroom practices.

Second, active participation gave the pre-service and in-service teachers a sense of agency. Building on the readings from the book study, each group could select an area of focus. Each week, the pre-service and in-service teacher had the opportunity to discuss and deliberate together over situations relevant to their classroom, school, and community. For example, at one school, teachers decided to focus on parental involvement and developed several community based initiatives. Concurrently, the pre-service teachers began seeing diversity beyond skin color or language among the students in their classroom. Their definition of diversity and how teachers implement culturally relevant pedagogy was greatly enhanced. We believe requiring the book study with their semester long internship, rather in an isolated course without a field placement component allowed the pre-service teachers the opportunity to truly connect theory with practice. Third, a commitment to lifelong learning should guide any model of professional learning for all educators from the most experienced to the novice. Project REACH provided opportunities for teachers, many for the first time, to ask difficult questions relating to culturally diversity. Based on their personal reflections, the book initiated topics which otherwise teachers would have felt uncomfortable bringing up among

colleagues. Similar to the teachers, many of the pre-service teachers indicated their lack of experiences and knowledge of cultural diversity and were often reluctant to discuss such topics for fear of "saying something politically or socially incorrect." Conversations about reaching all students became deliberate, purposeful, and planned. Pre-service and in-service teacher alike embraced the power of positive relationships and elevated expectations to reach the misinterpreted or disengaged students recognizing that only through reality and relations can rigor and relevance be applied. Without the close relationship with our PDS partners in planning, implementing, and reflecting on this joint professional development for both pre-service and in-service teachers, Project REACH would not have been possible. As we move forward in our quest to ensure that all student reach their optimum potential, the goals of Project REACH will be embedded in our thinking, our actions, and our progress with our PDS partners and what we achieve collectively for the individual faces, names, and diverse learners will be the measure of the pinnacle of success for our partnership community. SUP

References

Alabama State Department of Education. Alabama Quality Teaching Standards. Retrieved from http://alex.state.al.us/leadership/alqts_full.pdf

Bennett, C. I. (1995). *Comprehensive multicultural education: Theory and practice* (3rd ed.). Boston: Allyn & Bacon.

Burstein, N. D., & Cabello, B. (1989). Preparing teachers to work with culturally diverse students: A teacher education model. *Journal of Teacher Education, 40*(5), 9–16.

Chevalier, M., & Houser, N. (1997). Preservice teachers' multicultural self-development through adolescent fiction. *Journal of Adolescent and Adult Literacy, 40*(6), 426–436.

Clark, C. (2001). *Talking shop: Authentic conversation and teacher learning*. New York: Teachers College Press.

Corbin, J. M., & Strauss, A. L. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage Publications.

Denzin, N. K., & Lincoln, Y.S. (1998). Entering the field of qualitative research. In N.K. Denzin & Y.S. Lincoln (Eds.), *Collecting and interpreting qualitative materials* (pp.47–78). Thousand Oaks, CA: Sage Publications.

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational researcher, 38*(3), 181–199.

Elmore, R. F. (2002). *Bridging the gap between standards and achievement: The imperative for professional development in education*. Washington, DC: American Federation of Teachers, Albert Shanker Institute.

Fetterman, D. M., & Wandersman, A. (2005). *Empowerment evaluation principles in practice*. New York: Guilford Press.

Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education, 53*(2), 106–116.

Glaser, B.G., & Strauss, A. L. (1967). *The discovery of grounded theory*. Chicago, IL: Aldine.

Harlin, R., Marray, R., & Shea, M. (2007). Broadening teachers' views of diversity through multicultural book discussion. *Childhood Education, 85*(5), 299 −303.

Holmes Group. (1986). *Tomorrow's teachers*. East Lansing, MI: Holmes Group.

Holmes Group. (1995). *Tomorrow's schools of education: A report of the Holmes Group*. East Lansing, MI: Holmes Group.

Howard, T. C. (2003). Culturally relevant pedagogy: Ingredients for critical teacher reflection. *Theory into Practice, 42*(3), 195–202.

Keller, B. (2008). Book study helps teachers hone skills. *Education Week, 27*(38), 1–3.

Knight, S. L., & Wiseman, D. L. (2005). Professional Development for teachers of diverse students: A summary of the research. *Journal of Education for Students Placed at Risk, 10*(4), 387–405.

Kooy, M. M. (2006). The telling stories of novice teachers: Constructing teacher knowledge in book clubs. *Teaching and Teacher Education, 22*(6), 661–674.

Kuykendall, C. A. (2004). *From rage to hope: Reclaiming Black and Hispanic students*. Bloomington, IN: Solution Tree Press.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Association, 32*(3), 465–491.

National Center for Education Statistics (2012). *The condition of education: Status and trends in the education of racial and ethnic groups*. Retrieved from http://nces.edu.gov/pubs2010/2010015.pdf

National Center for Education Statistics (2012). *The Condition of Education: Characteristics of full-time teachers*. Retrieved from http://nces.ed.gov/programs/coe/indicator_tsp.asp

National Council of Accreditation for Teacher Education. (2008). *NCATE unit standards*. Retrieved January 21, 2009, from http://www.ncate.org/public/unitStandardsRubrics.asp?ch=4.

NCLB (2002) *Text of Public Law #107–110 No Child Left Behind*. Retrieved from http://www.nochildleftbehind.com/nclb-law-contents.html

Raphael, T., Florio-Ruane, S., Kehus, M., George, M., Hasty, N., & Highfield, K. (2001). Thinking for ourselves: Literacy learning in a diverse teacher inquiry network. *The Reading Teacher, 54*(6), 596–607.

Sleeter, C. E. (1995). An analysis of critiques of multicultural education. In J.A. Banks & C. A. McGee Banks (Eds.), *Handbook on research on multicultural education* (pp. 81 – 94). New York: Simon & Schuster Macmillan.

Smith, M. W., & Strickland, D. S. (2001). Complements or conflicts: Conceptions of discussion and multicultural literature in a teachers-as-readers discussion group. *Journal of Literacy Research, 33,* 137–167.

Strizek, G., Pittsonberger, J., Riordan, K., Lyter, D., & Orlofsky, G. (2006). *Characteristics of schools, districts, teachers, principals, and school libraries in the United States: 2003–2004 schools and staffing survey.* (NCES Report No. 20066313). Washington, DC: Government Printing Office.

United States Census Bureau. *(2010). Population Distribution and Change: 2000 to 2010.* Retrieved from http://www.census.gov/prod/cen2010/briefs/c2010br-01.pdf

Vaughan, W. (2004). Prospective teachers' attitudes and awareness toward culturally responsive teaching and learning. *Teacher Education and Practice, 17*(1), 45–55.

White-Hood, M. A. (2007). Becoming culturally proficient: A middle school principal uses a book study to foster discussion of race and culture. *Principal Leadership,* 8,(1), 35 – 36.

❖ ❖ ❖

Theresa M. McCormick is an associate professor and program chair of the Elementary Education Program in the Department of Curriculum and Teaching at Auburn University in Auburn, AL. Her research interests include school-university partnerships and teacher education.

Charles J. Eick is associate professor of elementary education at Auburn University where he teaches field-based courses in teaching and managing children in the culture of local schools. His area of expertise and research is in inquiry-based science education as a vehicle to motivate all children in learning science.

Janet S. Womack is the Superintendent of Florence City Schools in Florence, Alabama. Her research interests include school-university partnerships and equity in student learning.