Felicia Moore Mensah, Ph.D.
Associate Professor of Science Education
Teachers College, Columbia University
Email: fm2140@tc.columbia.edu
Faculty Page:
http://www.tc.columbia.edu/academics/index.htm?facid=fm2140

Scholarly Interests & Expertise

Science Teacher Education; Diversity, Equity & Social Justice Education; Urban and Multicultural Education

- Social justice (science teaching as achievement, access, empowerment, opportunity)
- Identity (positional identity and science teacher identity)
- Multicultural education, Critical theory, Critical race theory (teachers of color)
- Feminist poststructuralist analysis (power and knowledge; language and discourse; difference)
- Qualitative research methods (ethnography, case study, narrative, grounded theory, phenomenology)
- STEM education (Science, Technology, Engineering, Mathematics curriculum development)
- Culturally relevant, culturally responsive science teaching and curriculum
- Doctoral and junior faculty career development (newest interest)

Abstracts from Published Journal Articles & Book Chapters

1. Berg, A., & Mensah, F.M. (2014). De-marginalizing science in the elementary classroom by coaching teachers to address perceived dilemmas. *Education Policy Analysis Archives, 22*(57), 1-35. In EPAA/AAPE's Special Issue on *Politics, Policies, and Practices of Coaching and Mentoring Programs,* Guest Edited by Dr. Sarah Woulfin.

ABSTRACT: This study identifies and explores the dilemmas experienced by three first-grade teachers in teaching elementary school science. The impact of coaching and teachers' career stages on how teachers reconcile their dilemmas was examined. Results of this comparative case study indicate teachers perceived tensions between focusing instructional practice on science versus the other school subjects, tensions between their responsibility to teach science and their lack of a science background, and tensions between using their curriculum as a script, supplement, starting point, or not all. Participants reconcile their common dilemmas in different ways. Extent of teaching experience; comfort level with teaching reading, writing, and mathematics; and the sense of accountability teachers feel to teach science are related to how effectively dilemmas are addressed. The amount of time spent with the science coach-researchers is tied to the amount of time science is taught and the extent to which teachers address dilemmas in reform-oriented ways. Keywords: Science coach; elementary science; dilemmas; professional development

2. *#Mensah, F.M. (2014). Creating solidarity across diverse communities: International perspectives in education, by Christine E. Sleeter and Encarnación Soriano (Editors). Teachers College Press, New York, NY, USA, 2012, 230 pp. ISBN: 978-0-8077-5337-8. Book Review, *Teachers College Record.* http://www.tcrecord.org ID Number: 17531

FIRST PARAGRAPH: Christine Sleeter and Encarnacion Soriano, serving as editors, bring together a collected volume of research studies that examines barriers to building relationships of solidarity between schools and marginalized communities. The book highlights the perils and possibilities for transcending these barriers within various communities, with research from the United States, Spain, New Zealand, Mexico, India, France, and Chile. Chapters throughout the book "dispel negative myths about diverse populations in particular contexts" and "build relationships based on communication, respect, and mutuality" (p. 3). Each chapter also outlines and uses solidarity toward social justice and social change within education. This indeed is a challenging endeavor since "building solidarity is perhaps the most crucial yet undertheorized process in organizing people for social change-an essential yet elusive component of any successful movement" (Dobbie & Richards-Schuster, 2008, p. 138). As a collective, each research study extends notions of solidarity beyond making one feel good, thus challenging us to fully engage ourselves, to question the work that we do as educators and researchers, and to join allies in the work that is required to build strong schools and communities built upon solidarity. The studies communicate successful and not so successful attempts in working toward solidarity. This book frames solidarity by theorizing about it across multiple contexts so that readers are able to extend their understandings and definition of solidarity-particularly in how it is applied in education and with marginalized groups. The international context of the book brings to mind that issues of solidarity are not just issues that educators in the United States struggle with; rather, the international focus connects us all as agents of social change.

3. Mensah, F.M. (2014). Using observation prompts in the urban elementary school field placement. In Y. Sealey-Ruiz, C.W. Lewis, & I. Toldson (Eds.), Teacher education and black communities: Implications for access, equity and achievement, (*pp.*). Charlotte, NC: Information Age Publishing.

PURPOSE: There is an emergent body of research on the urban field placement and the preparation of teachers for these settings (Lee et al., 2010; Roselle & Liner, 2010; Sleeter, 2001). Still few studies pertaining to field experiences focus on student diversity, urban school culture, and science teaching. Therefore, considering previous research on the urban field placement, journaling, and the preparation of teachers for diverse settings, the purpose of this study is to describe how weekly guided observation prompts were used as an initial assignment in an elementary science methods course. The emphasis was on providing a rich, field-based experience, while focusing on issues of diversity in urban science teaching prior to formal student teaching internships through journaling. The research question for this study was: In what ways do guided observation prompts aid elementary preservice teachers in gaining a deeper understanding of student diversity, school culture, and science teaching in urban elementary schools?

4. Graham, R., Zubiaurre Bitzer, L., Mensah, F.M., & Anderson, O.R. (2014). Dental student perceptions of the educational value of a comprehensive, multidisciplinary OSCE. *Journal of Dental Education, 78*(5), 694-702.

ABSTRACT: The aim of this study was to examine student perceptions of the educational value of a comprehensive, multidisciplinary objective structured clinical examination (OSCE). The examination is administered after the second year of the curriculum, prior to the beginning of clinical training at the Columbia University College of Dental Medicine. The quantitative component of the study consisted of a survey administered to students who had taken the OSCE (N=78). Due to the ordinal level of data produced by the Likert-scale survey, statistical analysis was performed

through calculation of the median and interquartile range (IQR). Overall, student perceptions of the educational value of the OSCE, as measured using a five-point scale (1=strongly disagree to 5=strongly agree) were positive, demonstrating students' agreement that the exam required the ability to think critically and problem-solve (median=4, IQR=1), assessed clinically relevant skills (median=5, IQR=1), and was a learning experience (median=5, IQR=1). A statistically significant chi-square value ($p<0.001$) was found for all questions. The qualitative component consisted of phenomenological examination of student focus group interviews (N=15). Four main themes were identified including that the OSCE was an authentic assessment that required integration and application of knowledge. Key words: objective structured clinical examination, OSCE, assessment, dental education

5. Brotman, J., & Mensah, F.M. (2013). Urban high school students' perspectives about sexual health decision-making: the role of school culture and identity. *Cultural Studies of Science Education, 8(2), 403-431.*

ABSTRACT: Studies across fields such as science education, health education, health behavior, and curriculum studies identify a persistent gap between the aims of the school curriculum and its impact on students' thinking and acting about the real-life decisions that affect their lives. The present study presents a different story from this predominant pattern in the literature. Through a year-long ethnographic investigation of a health-focused New York City public high school's HIV/AIDS and sex education program, this study illustrates a case in which 20 12th grade students respond positively to their education on these topics and largely assert that school significantly influences their perspectives and actions related to sexual health decision-making. This paper presents the following interpretation of this positive influence: School culture influences these students' perspectives and decisions around sexual health by contributing to the formation of students' identities. This paper further shows how science learning in particular becomes important for students in relation to decision-making when it is linked to issues of identity. These findings suggest that, in addition to attending to the design of classroom curriculum, HIV/AIDS and sex education researchers and curriculum developers (as well 23 as those in science education focusing on other controversial science topics) might also explore 24 the kinds of relational and school-wide factors that potentially influence students' identities, 25 decisions, and responses to school learning. Keywords: Decision-making , Identity, HIV/AIDS, Sex education, Biology, School culture

6. Mensah, F.M. (2013). Theoretically and practically speaking, what is needed in diversity and equity in science teaching and learning? *Theory Into Practice, 52*(1), 66-72. Special Theme Issue: *Diversity and Equity in Science Education*

ABSRACT: Teacher education is critically important on several levels: first, it is essential to the success of teacher practice and student learning for diverse groups; and second, it is foundational for future growth and development of teachers and their students. This article discusses how issues of diversity and equity are addressed in the preparation of science teachers who are charged with teaching diverse students in schools. Highlighting examples from my teaching and a few studies in education, I frame this commentary in terms of a broad application of theory in science teacher education and its application to classroom practices that are needed to address science achievement and equity for diverse students, and discuss the relevance of my argument for in-service professional development.

7. Mensah, F.M. (2012). Positional identity as a lens for connecting elementary preservice teachers to science teaching in urban classrooms. In M. Varelas (Ed.), *Identity construction and science*

education research: Learning, teaching, and being in multiple contexts, (pp. 107-123). Rotterdam, The Netherlands: Sense Publishers.

INTRODUCTION: Using qualitative methods of data collection and analysis, this study explores positional identity as a lens for understanding elementary preservice teachers' discourse around identity and science teaching. The three preservice teachers in the study were enrolled in a 16-week science methods course. At the conclusion of the course, they agreed to participate in this study to explore early understandings of positional identity and science teaching. The findings suggest that positional identity is a useful lens for understanding the complex ways in which preservice teachers discuss who they are, and how they view self and teaching. Their views of self can be used to develop stronger relationships to science, to teaching science in urban classrooms, and for developing relationships with students in urban classrooms.

8. Rivera Maulucci, M., & Mensah, F.M. (2012). NARST equity and ethics committee: Mentoring scholars of color in the organization. In J.A. Bianchini, V. L. Akerson, A. Calabrese Barton, O. Lee, & A. J. Rodriguez (Eds.), *Moving the equity agenda forward: Equity research, practice, and policy in science education*, (pp. 295-316). New York, NY: Springer.

IINTRODUCTION: In this chapter, we analyze the ways in which the "problem" of underrepresentation gets framed, the challenges and possibilities scholars of color navigate, and the possibilities of using organizations like NARST to support the career trajectories of scholars of color in the academy. In particular, we describe our work as members of the NARST Equity and Ethics Committee in developing and facilitating the preconference workshop and explain how this work contributes to building a community of scholars.

9. Mensah, F.M. (2012). Retrospective accounts in the formation of an agenda for diversity, equity and social justice for science education. In J.A. Bianchini, V. L. Akerson, A. Calabrese Barton, O. Lee, & A. J. Rodriguez (Eds.), *Moving the equity agenda forward: Equity research, practice, and policy in science education*, (pp. 317-336). New York, NY: Springer.

FIRST PARAGRAPH: It's the first day of class. This is always an exciting and nervous day for me. First, I'm excited because it is a new semester—new students with new ideas and perspectives. I wonder who they are as persons and what insights they will bring to the class. Second, I'm nervous for the same reason. I imagine how they will receive my ideas and me. The first day of class sets the tone for the rest of the semester.

10. Johnston, A., Butler, M. B., Mensah, F.M., & Williams, B. (2011). Playing with science: Models for engaging communities. Special issue on Designing Environments to Promote Play-based Science Learning. *Children, Youth and Environments, 21(2), 312-324.*

ABSTRACT: This field report provides examples of how "play" is a model for science education in informal environments. By utilizing community settings such as parks during the summer, schools in the evening, and museum space on the weekend, accessible contexts for children and their families are provided in these examples. The contexts, methods, and activities of each of these examples are described in order to suggest the wide variety of ways in which science education can be woven with community through play.

11. Mallya, A., Mensah, F.M., Contento, I.R., Koch, P.A., & Calabrese Barton, A. (2012). Extending science beyond the classroom door: Learning from students' experiences with the Choice, Control & Change (C3) curriculum. *Journal of Research in Science Teaching*

    Honor/Acknowledgment-- Republished in three NSTA journals as current education research and recommended Summer Reading List for teachers, Summer/July 2013 issues of *Journal of College Science Teaching*, *The Science Teacher*, & *Science Scope*

ABSTRACT: This paper describes the experiences of seventh-grade students living in high poverty areas of New York City who participated in the *Choice, Control & Change (C3)* science curriculum. Data were collected from eight case study students in the form of individual interviews, classroom observations, and student artifacts. Analysis of these data revealed that students were able to extend their *C3* science understandings beyond the classroom door by developing and expressing *science agency* in the following ways: (1) critically analyzing the conditions of their food environment, (2) purposeful attempts to make healthier choices, and (3) expanding the food and activity options available to themselves and others. Through participation in the *C3* curriculum, and the science content and practices addressed therein, students began to view their worlds with a more critical mindset and to devise ways to transform themselves and the conditions of their own and others' lives. Based on the findings, we propose taking a closer look at how we might create meaningful and relevant learning opportunities for students through connecting school science with issues of personal and social significance in students' lives outside of school.

12. Mensah, F.M. (2011). The DESTIN: Preservice teachers' drawings of the ideal elementary science teacher. *School Science and Mathematics*, 111(8), 379-388.

ABSTRACT: The aim of this study is to report findings from the Drawing-Elementary-Science-Teacher-Ideal-Not, or DESTIN procedure. The study utilizes a simple drawing procedure accompanied by a narrative and discussion for understanding preservice teachers' images of science, science teaching, and the science teacher. Ninety drawings from two sections of an elementary science methods course were analyzed. Looking at the pre-drawings from the beginning of the semester and post-drawings done at the end of the semester, the findings relate the value of using drawings in teacher education and the usefulness of this procedure to promote discussions about science teaching, the construction of new images and practices for teaching elementary science, and teacher identity. The DESTIN procedure has potential as a productive activity for teacher education and long-term professional development by making more explicit teachers' views of science teaching and learning and their past experiences as science learners.

13. Mensah, F.M. (2011). A case for culturally relevant teaching in science education and lessons learned for teacher education. *The Journal of Negro Education, 80*(3), 296-309. Special Issue: Teacher Education and the Black Community: Preparing Teachers to Teach Black Students, Preparing Black Students to Become Teachers.

    Honor/Recognition: Selected for republication in 2014 Annual Editions: Multicultural Education, published by McGraw-Hill

ABSTRACT: In this article, the researcher discusses three elementary pre-service teachers' experiences in co-planning and co-teaching a Pollution Unit in a 4th-5th grade science classroom in New York City. The study makes use of microteaching papers, lesson plans, researcher classroom observations, interviews, and informal conversations to elicit lessons learned from implementing culturally relevant teaching in science education. Examples of pre-service teachers' planning process, culturally relevant teaching examples, assessment of student learning, and reflections on

microteaching are also presented as exemplars and interpretations of culturally relevant science teaching. Implications from the study are discussed in terms of support to enact culturally relevant teaching in urban elementary classrooms and in pre-service science teacher education.

14. Mensah, F. M. (2011). On the road to reform: A sociocultural interpretation of reform. *Cultural Studies of Science Education, 6*(3), 671-678.

ABSTRACT: In this paper I discuss how reform in science education is interpreted by Barma as she recounts the story of Catherine, a grade 9 biology teacher, who reforms her teaching practices in response to a national curriculum reform in Quebec, Canada. Unlike some cases in response to reform, this case is hopeful and positive. Also in this paper, I address some familiar areas that must be considered when teachers undertake curriculum reform and how science educators may fulfill the role of facilitator and advocate in the support of teachers on the road to reform. The commentary focuses on how Barma retells the story through the lens of activity theory.

15. Mensah, F.M. (2011). The hardest questions aren't on the test: Lessons from an innovative urban school. Book Review. *Science Education, 95*(4), 768-770.

FIRST PARAGRAPH: Linda Nathan compassionately writes about her experiences and learning as an administrative leader in The Boston Arts Academy (BAA), an ethnically and socioeconomically diverse urban school in Boston, Massachusetts. The mission of the 11-year-old pilot school situated within the Boston Public School district is to be a "laboratory and a beacon for artistic and academic innovation" (p. x) for 420 students and 45 teachers. The intent of BAA is to address student learning and academic achievement and to create a school where students truly own their learning and everyone knows what the school stands for.

16. Brotman, J.S., Mensah, F.M., & Lesko, N. (2011). Urban high school students' learning about HIV/AIDS in different contexts. *Science Education, 95*(1), 87-120.

ABSTRACT: Science education researchers increasingly focus on the use of controversial science topics in the classroom to prepare students to make personal and societal decisions about these issues. However, researchers infrequently investigate the diverse ways in which students learn about controversial science topics outside the classroom, and how these interact with school learning. Therefore, this study uses qualitative, ethnographic research methods to investigate how 20 high school students attending a New York City public school learn about a particular controversial science topic—HIV/AIDS—in different contexts, as well as how different sources of learning interact. In addition to finding that learning about HIV/AIDS happens across seven contexts of students' lives in diverse ways, including and beyond school settings, this study finds that students integrate learning that happens in these different contexts to shape their understandings and perspectives on HIV/AIDS issues. These findings are used to discuss the place of school learning within students' thinking about HIV/AIDS, highlighting ways in which students both value and discount their school learning in relation to other sources of learning. On the basis of our analysis, we make suggestions for bringing different sources of learning into the classroom to facilitate critical analysis of controversial science topics.

11. Brotman, J.S., Dawson, V., & Mensah, F.M. (2011). Metalogue: Critical issues for teaching with socio-scientific issues. In T. D. Sadler (Ed.), *Socio-scientific issues in the classroom: Teaching, learning and research* (pp. 347-353). New York, NY: Springer.

FIRST PARAGRAPH: Despite numerous links to complex SSI, the topic of reproduction has not been a frequent focus of SSI research. This chapter vividly illustrates the potential for topics related to reproduction to engage students in the kind of thinking promoted by the SSI movement. It was refreshing to see that students responded positively to the reproduction unit, and that it prompted them to become more aware of their own and other's beliefs, to more deeply understand these issues, to see these issues as personally relevant, and to reflect upon the interplay between science, society, and ethics.

12. Yu, Yuqing, & Mensah, F.M. (2011). The multiple response model for the "views on science-technology-society" (VOSTS) instrument: An empirical application in the context of the electronic-waste issue. In I.M. Saleh & M. S. Khine (Eds*.), Attitude research in science: Classic and contemporary measurements* (pp. 137-176). Charlotte, NC: Information Age Publishing.

FIRST PARAGRAPH: A major goal of science education today is to promote students' understanding of the nature of science, technology, and their interactions within society (American Association for the Advancement of Science [AAAS], 1990, 1993; National Research Council [NRC], 1996). To accomplish this goal, science educators have advocated the instruction of scientific knowledge in the context of Science-Technology-Society (STS) education. STS education supports students' natural tendency to integrate their personal understandings of the natural, technological, and social environments (Aikenhead, 1994; Layton, 1994; Ziman, 1994). Fundamentally, it is student-oriented; ultimately, it aims to promote students' social responsibility in collective decision making on issues related to science and technology (Aikenhead, 1994; Ziman, 1994).

13. Gunning, A.M., & Mensah, F.M. (2010). One pre-service elementary teacher's development of self-efficacy and confidence to teach science: A case study. *Journal of Science Teacher Education, 22*(2), 171-185.

ABSTRACT: This study examines the self-efficacy of one preservice elementary school teacher (Kasey) during and after her participation in Science in Childhood Education—a 16-week, elementary preservice science methods course. The case study of this teacher is situated in the context of the class as a whole. This is accomplished through interviewing the one teacher and examining artifacts and observations of the entire class. The results of these experiences are studied to determine what changes have taken place in the participants' self-efficacy in science teaching as well as the one preservice teacher in greater detail. Because self efficacy is influential to student learning, the results of this study have significant implications for the design of elementary teacher education programs and the support of elementary teachers in teaching science.

14. Marrero, M., & Mensah, F. M. (2010). Socioscientific decision making and the ocean: A case study of 7th grade life science students. *Electronic Journal of Science Education, 14*(1), 1-27.

ABSTRACT: The purpose of achieving ocean literacy, like scientific literacy, is for citizens to be able to make informed decisions based on science. One approach for teaching students about decision making is to use socioscientific issues, or "SSI." The case study included a group of students participating in an ocean literacy-focused curriculum called Signals of Spring – ACES. The authors used focus group interviews, student-produced documents, and a decision-making task to explore decision making as it relates to the ocean. Findings contradict previous ones that students do not rely on what they learn in science class when making decisions. The 7th grade students in this study were able to apply ocean concepts pertaining to physical and biological processes to personal and societal decision making related to pollution, food choice, and on a sample SSI-based task. The

results suggest that students are empowered by the knowledge of the ocean gained through the ACES curriculum and that using SSI may be a way to help students achieve ocean literacy.

15. Mensah, F.M. (2010). Toward the mark of empowering policies in elementary school science programs and teacher professional development. *Cultural Studies of Science Education, 5*(4), 977-983.

ABSTRACT: In this commentary, I discuss how policy initiatives play out in two different contexts for elementary school teachers yet produce very similar outcomes regarding teachers' professional development and school science learning for elementary students. Ironically, the outcomes that we want see in elementary school science learning and professional development are not realized when policies are introduced that distract from practices that were working prior to new reforms.
Keywords: Elementary science, Professional development, Policy

16. Mensah, F.M. (2010). Who do I look like? Diversity in self, family, and others. *Science Activities, 47*, 125-132. Special Issue: Multicultural Science Teaching.

Abstract: In this introductory, hands-on, multicultural genetics lesson for elementary students, the author describes an activity used to engage learners in understanding diversity in self, family, and others. Students make connections between traits within their family and learn a few basic concepts about inheritance. At the end of the lesson, the author provides extension activities for interdisciplinary connections.

17. Brotman, J.S., Mensah, F.M., & Lesko, N. (2010). Exploring identities to deepen understanding of urban high school students' decision-making about HIV/AIDS. *Journal of Research in Science Teaching, 47*(6), 742-762.

ABSTRACT: Sexual health is a controversial science topic that has received little attention in the field of science education, despite its direct relevance to students' lives and communities. Moreover, research from other fields indicates that a great deal remains to be learned about how to make school learning about sexual health influence the real-life choices of students. In order to provide a more nuanced understanding of young people's decision-making, this study examines students' talk about sexual health decision-making through the lens of identities. Qualitative, ethnographic research methods with twenty 12th grade students attending a New York City public school are used to illustrate how students take on multiple identities in relation to sexual health decision-making. Further, the study illustrates how these identities are formed by various aspects of students' lives, such as school, family, relationships, and religion, and by societal discourses on topics such as gender, individual responsibility, and morality. The study argues that looking at sexual health decision-making—and at decision-making about other controversial science topics—as tied to students' identities provides a useful way for teachers and researchers to grasp the complexity of these decisions, as a step toward creating curriculum that influences them.
Keywords: health science; biology; socioscientific issues; secondary

18. Geelan, D., Mensah, F.M., Rahm, J., & Maulucci, M.R. (2010). Forum: Roles, caring and learning to teach science. *Cultural Studies of Science Education, 5*(4), 649-663.

ABSTRACT: Classroom narratives and stories are rich and powerful in offering deep insights into classrooms and the reality of teaching—a reality critically re-examined in this forum. Discussing Maria's narratives led to reflections about what it takes to support teachers to become agents of more equitable science practices. Factors such as time and identity-work are key

dimensions of the authors' struggle, but they also address understanding students in profound ways. The ways in which contradictions at different levels in the educational system can become sources of growth, reflection and action are discussed; yet no simple answers follow. Teaching and becoming a teacher are best understood as life-long processes of reflection and action and as political acts that entail challenging many boundaries. They also involve putting oneself into vulnerable roles and positions. This dialogue opens up many questions about how we can collaborate, guide and support both novices and experienced professionals in education as researchers, science staff developers, and teacher educators. It seeks to support the on-going quest to make science education authentic and equitable. Keywords Narrative, Beginning teacher development, Understanding youth, Positionality

19. Parsons, A.C., & Mensah, F.M. (2010). Black feminist thought: The lived experiences of two black female science educators (pp. 13-24). In K. Scantlebury, J.B. Kahle, & S.N. Martin (Eds.), *Re-visioning science education from feminist perspectives: Challenges, choices and careers*. Rotterdam, The Netherlands: Sense Publishers.

INTRODUCTION: As Black females from working class origins in the rural South, we encounter a myriad of challenges and tensions in science education, a field that is predominantly White, male, and middle class. Even in writing this chapter, we struggled: Are we at liberty to use the communicative practices of our cultural communities? Do we structure our sharing in a manner that is more acceptable to the field? We decided to employ both communicative repertoires in the form of personal stories and conversation framed by theory. Within our stories, we relay episodic snippets of our childhood and adolescence as well as our years as undergraduates at The University of North Carolina at Chapel Hill (UNC). In our conversation, we discursively discuss our careers in relation to our worldviews. At the outset, we conform to the standard in the field by contextualizing our personal histories and dialogue within a conceptual framework, Black feminist thought.

20. Moore Mensah, F. (2009). A portrait of black teachers in science classrooms. *The Negro Educational Review, 60*(1-4), 39-52.

ABSTRACT: Although the body of research that presents the stories of Black teachers is increasing and contributing to a more accurate portrait of their knowledge and practices, few of these studies provide portraits of Black teachers as content-specific experts. Using narrative research methods, this study reports findings of three Black secondary science teachers—two females and one male—and the knowledge gained from their personal experiences in science and characteristics they bring to science teaching for Black students. The study took place in two high schools in a rural, predominantly Black school district in the Southeastern United States. The study highlights additional characteristics of Black science teachers that give attention to content-specific expertise.

21. Moore Mensah, F. (2009). Confronting assumptions, biases, and stereotypes in preservice teachers' conceptualizations of science teaching and diversity through the use of book club. *Journal of Research in Science Teaching, 46*(9), 1041-1066.

ABSTRACT: This study focuses on the structure and theoretical foundations of the book club for promoting multicultural understandings in science teacher education. The book club was defined as an informal, peer-directed group discussion that met regularly to discuss an ethnographic, multicultural text regarding issues pertinent to science teaching and learning in urban classrooms. Twenty-three preservice teachers (PSTs) enrolled in a 16-week elementary science methods course at a large urban university participated in the study. From the qualitative analyses of PSTs' written reflections and researcher journal notes, five themes which emphasize Individual, Collaborative,

and Collective learning are presented. These findings highlight how the book club structure and theoretical foundation fostered critical, reflective inquiry and served as a method for effecting ideological change which is needed in order to embrace issues of diversity in urban science education. Implications for science teacher education concerning the relevancy of pedagogical strategies, the use of multiple theoretical perspectives, and the book club as a strategy in teacher education and urban education are discussed. Keywords: science teacher education; multicultural science; critical theory; college/university

22. Catlin, J.N., & Mensah, F.M. (2009, March). Creating and equitable classroom through establishing respect [Electronic Version]. *Beyond Penguins and Polar Bears*, from http://beyondpenguins.nsdl.org/

ABSTRACT: The relationship between teacher and student is important in that their interaction is essential for successful teacher practice and student learning to take place. Our teaching experiences both in school and in informal settings let us understand the delicate balance of first establishing high expectations for students through informing them of acceptable classroom practices and second creating an environment that welcomes students to express their ideas about these practices. The underlying theme that resonates through this way of teaching is respect. Respect between teacher and student is necessary for success in the classroom.

23. Brotman, J.S., & Mensah, F.M. (2008). Girls and science: A review of four themes in the science education literature. *Journal of Research in Science Teaching, 45*(9), 971-1002.

ABSTRACT: Despite valuable syntheses of the field of gender and science education, there has not been a systematic, comprehensive review of the literature on gender and science education in recent years. We examine the literature pertaining to girls' engagement in science and develop four themes (equity and access, curriculum and pedagogy, the nature and culture of science, and identity) that we believe provide a coherent picture of the different kinds of approaches happening currently, while at the same time allowing for discussion of how ideas in the field have progressed and changed over time. We present new questions and approaches for further research that arise when applying insights from these themes to ongoing work in gender and science education. Keywords: gender/equity; science education

24. Moore, F.M. (2008). Agency, identity, and social justice: Preservice teachers' thoughts on becoming agents of change in urban elementary science classrooms. *Research in Science Education, 38*(5), 589-610.

ABSTRACT: Using multiple theoretical frameworks, reflective writings and interviews, this study explores preservice elementary teachers' emerging identities as science teachers and how this identity is connected to notions of critical agency and a stance toward social justice. The study addresses two central questions pertaining to preservice teachers' conceptions as "agents of change" and how their perceptions as change agents frame their science teacher identities and understanding of teaching science in urban elementary classrooms. Their identity in the moment as elementary preservice teachers—not yet teachers—influences how they view themselves as teachers and how much agency or power they feel they have as agents of change in science classrooms. Findings suggest that science teacher education must play a more immediate, fundamental and emancipatory role in preparing preservice teachers in developing science teacher identities and a stance toward social justice. Keywords: Identity, Agency, Social justice, Preservice elementary teachers, Urban education

25. Moore, F.M. (2008). Positional identity and science teacher professional development. *Journal of Research in Science Teaching, 45*(6), 684-710.

ABSTRACT: The aim of this study was to understand the positional identity of three African American secondary science teachers. Positional identity was operationally defined in terms of race, ethnicity, economic status, gender, religion, and age. Positional identity was posited to inform why diverse teachers with differing knowledge and experiences in science exist. An analysis of the findings suggested that the teachers' positional identity was defined beyond race, ethnicity and gender. Although the three science teachers came from very similar social backgrounds and were members of the same racial/ethnic group (African American), their positionality manifested itself in different ways: meanings of their life experiences; orientations to professional development; and future career goals in science education. Thus they possessed multiple positional identities that intersected in various ways which resulted in them having different perceptions of the world and subjectivities as science teachers. Implications included addressing positional identity and the creation of professional development models that are framed around incorporating teacher identity in addition to furthering teachers' personal and professional advancement within science education. Keywords: general science; professional development; diversity; science education

26. Moore, F.M. (2008). The role of the elementary science teacher and linguistic diversity. *Journal of Elementary Science Education, 20*(3), 49-61.

ABSTRACT: This qualitative study looks at 23 elementary preservice teachers' roles as science teachers and the importance of understanding linguistic diversity for science instruction. Using individual and group reflection papers, two important points are made that reflect the importance of preparing preservice teachers in science. Explicit conversations and tasks to connect science and linguistic diversity to science teaching suggests that preservice teachers need to discuss the implications of scientific language and linguistic diversity in terms of power and science teaching and learning in urban classrooms.

27. Moore, F.M. (2008). Preparing preservice teachers for urban elementary science classrooms: Challenging cultural biases toward diverse students. *Journal of Science Teacher Education, 19*(1), 85-109.

ABSTRACT: This study reports the learning of elementary preservice teachers regarding diversity and teaching science in diverse urban elementary classrooms. From participating in a semester-long book club, the preservice teachers reveal their cultural biases, connect and apply their knowledge of diversity, and understand that getting to know their students are important elements for teaching science in diverse classrooms. These 3 things connect in ways that allow the preservice teachers to understand how their cultural biases impede student learning and gain new knowledge of diversity as they change their cultural biases. Implications of this study reveal that preservice teachers need opportunities to reveal, confront, challenge, and change their cultural models and to develop new models for teaching science in urban elementary classrooms.

28. Moore, F.M. (2007). Language in science education as a gatekeeper to learning, teaching, and professional development. *Journal of Science Teacher Education, 18*(2), 319-343.

Abstract: In this study, I used a feminist poststructural perspective to explain how language is a gatekeeper in learning science, in achieving professional honors in teaching science, and in teaching science to English language learners. The various uses of language revealed interesting dynamics related to the culture of power of language and the culture of power of science along race–ethnicity,

gender, and class dimensions for teachers. Teachers did not necessarily see language as having distinct purposes and uses. This further maintained the gatekeeping nature of language and discourse in science education. I discuss implications for looking at language in science education for teacher professional development and student learning.

29. Moore, F.M. (2007). Teachers' coping strategies for teaching science in a "low performing" school district. *Journal of Science Teacher Education, 18(*5), 773-794.

ABSTRACT: This study describes how teachers use their personal knowledge of a school district and their students to cope with teaching under stressful situations associated with economic, social, and institutional factors. The 3 teachers dealt with these issues in unique ways, focusing on helping students to overcome negative perceptions, value the importance of an education, and build strong relationships. A model of multicultural science professional development is proposed that complements the strengths that these teachers have. A task for science educators working with teachers and administration in schools and districts that are ''critically low performing'' is to support everyone in implementing pedagogical methods aimed at empowerment, social justice, and high achievement for all students. Keywords African American teachers, Multicultural

30. Moore, F. (2006). Multicultural preservice teachers' views of diversity and science teaching. *Research and Practice in Social Sciences, 1*(2), 98-131.

ABSTRACT: This collective case study of ten ethnically and culturally diverse preservice teachers reports their perspectives of diversity, diverse learners, and teaching science in diverse urban elementary classrooms. Data sources consisted of reflective writings from participating in a Book Club, and initial and final surveys. Findings reveal that the multicultural preservice teachers moved beyond simplistic understandings of issues of diversity to more inclusive and broader meanings. With these broader understandings came their concerns and fears for teaching diverse learners. Encouraging preservice teachers to develop positive dispositions necessitates supporting them in teaching for diversity.

31. Moore, F.M. (2003). In the midst of it all: A feminist perspective on science and science teaching. In A.L. Green & L.V. Scott (Eds.), *Journey to the Ph.D.: How to navigate the process as African Americans* (pp. 104-121). Sterling, VA: Stylus.

INTRODUCTION: After taking a graduate course entitled Education and Culture, I thought about how culture influences the way students learn science and how I am influenced in teaching it. The course not only enlightened me to a new area of focus for science education but also broadened my perspective as to how I could become a more effective educator. As a requirement for the course, I was expected to conduct an independent research project or fieldwork that involved some aspect of a cultural issue. I was interested in cultural capital.