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Ruthmae Sears  
*University of South Florida*

Tonisha B. Lane  
*University of South Florida*

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## **Integrating Diversity Training into Doctoral Programs in Mathematics Education**

**Ruthmae Sears**

**Tonisha B. Lane**

**University of South Florida**

There exists a need to promote diversity, equity, and inclusion in mathematics education (Wilson and Franke, 2008). Being cognizant that there are few underrepresented groups that obtain doctoral degrees in mathematical sciences or mathematics education (AMS, 2014; Reys and Dossey, 2008), focused training is needed to prepare doctoral students on diversity issues that may arise in higher education and the means by to address such issues. An advance seminar course or colloquium that would be helpful to mathematics education doctoral students who seek a career position in higher education should be entitled, “Gaining a better perspective of diversity in higher education”. This course would addresses issues related to establishing and sustaining an equitable and inclusive environment in classroom environments and throughout the university. “Climate can be examined through various components...structural diversity (the number of underrepresented students on a campus), the psychological climate (prejudice), and behavioral dimensions (relations among students, an instructors’ pedagogical approach)” (Hurtado, Milem, Clayton-Pedersen, and Allen, 1999, p. x). The climate is often enacted in the hidden curriculum that complements the overt curriculum of the university. Admittedly, diversity courses taught at many universities might address diversity climate issues, however it is not a requirement for a doctorate in mathematics education, and hence most doctoral students in mathematics education never enroll in such courses. Considering that by the year 2044, more than half of the U.S. population will be individuals of color (Colby & Ortman, 2015) and the academy is becoming increasingly diverse, it is imperative that we train educators to work within such diverse contexts. Thus, gaining an understanding of the complexities of diversity, and how to incorporate

it into their practice will be vital to mathematics education doctoral students' success in academia.

Therefore, we propose that an advance seminar course or colloquium in mathematics education be dedicated to the teaching of diversity, equity, and inclusion in higher education: We will first discuss the content that should be covered, and subsequently describe how the training should be organized. By first shedding light on what ought to be learned, faculty members can strategically incorporate pedagogical strategies to promote the learning of the desired content.

### ***Content to be taught***

Hurtado, Milem, Clayton Pedersen and Allen (1999) identified four elements that can significantly influence campus climate: *historical legacy of inclusion, structural diversity, psychological climate, and behavioral dimensions*. These four elements will be the core content doctoral students ought to consider in preparing to work within diverse and inclusive higher education contexts.

First, the historical component reflects the tradition of the university. The school goals and policies may be guided by the history in which schools were founded. For example, historically black colleges and universities (HBCU), enrollments have a large percentage of students who are individuals of color. HBCUs were founded to provide education for individuals that were denied access to higher education during segregated eras in education. Additionally, legal challenges can be intertwined into the history of the university. Notwithstanding, many predominantly white universities (PWIs) history promoted segregation, and individuals of color only gained admission because of Supreme court rulings or affirmative action (e.g. Gaines vs. Canada was filed to allow Lloyd Gaines access to the University of Missouri-Columbia in 1938) (Bluford,1959). Hence, the campus climate can be influenced by the school's history for inclusion initiatives (or lack thereof).

Second, structural diversity of the university can significantly impact the climate of diversity at the university. The structural diversity encompasses the ethnicity, race, religion, gender, and sexuality of faculty, staff and students. Researchers have shown that minority ethnic groups may feel repelled when the percentage of minority is small, when compared to the larger population (Hurtado, Milem, Clayton Pedersen and Allen, 1999). Hence universities are challenged to diversify faculty with the intent that it could promote the diversification of the student body. Hurtado, Milem, Clayton Pedersen and Allen (1999) argued that there are five major benefits of diversifying faculty. They noted,

First, faculty of color are able to provide support that benefit students from their particular group...Second a diverse faculty and staff serve as important representatives of the commitment of the institution has to issues of diversity. Third a more diverse faculty and staff serve to create a more comfortable environment ...Fourth, a diverse faculty and staff brings more voices and more diverse perspectives...Fifth, a diverse faculty and staff reflects one measure of institutional success for an educational institution in a pluralistic society. (Hurtado, Milem, Clayton Pedersen and Allen, 1999, p.22)

The benefits of diversifying the faculty populace can have implications for improving campus climate for students of color. Observing faculty in the classroom that is representative of the student population can contribute to positive outcomes for students of color, in addition to majority students (Umbach, 2006). Hence, the structural diversity can significantly impact campus climate within the university setting. Notwithstanding, diversity efforts must seek to ensure that all individuals (both majority and minority) feel valued and a part of the community in which they study, work and socialize.

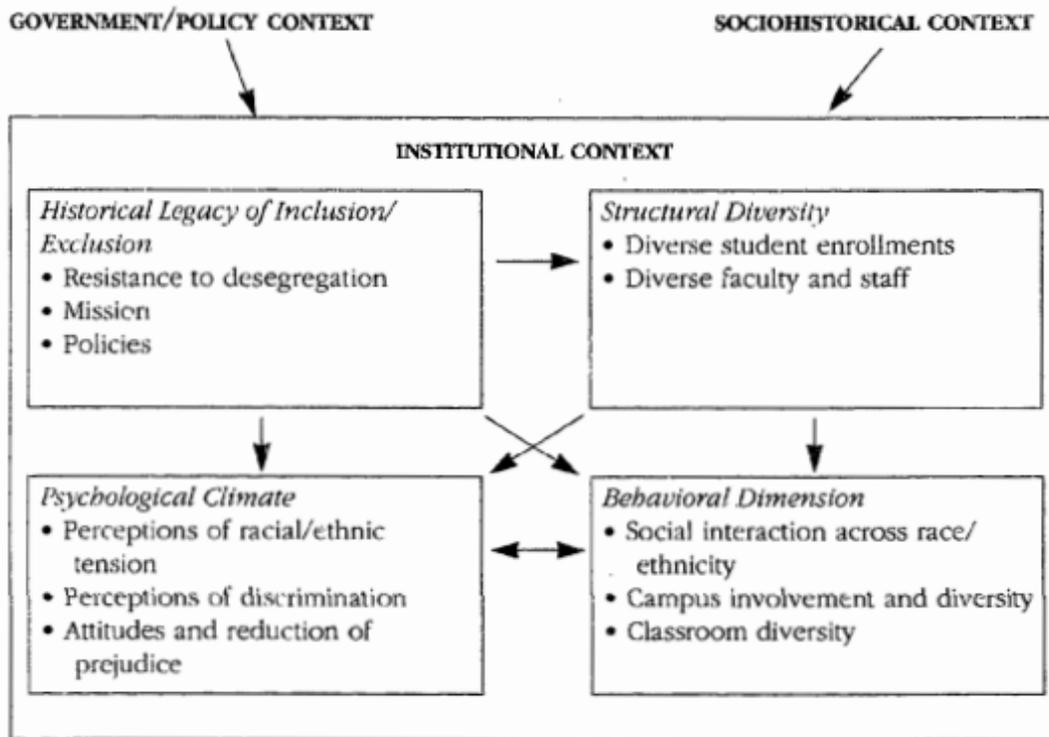
Third, the psychological climate of the university may reflect perception of racism, prejudice or forms of discrimination. Higher education institutions must seek to create inclusive environments such that underrepresented groups feel valued and welcomed. Thus, faculty

members are challenged to ensure that their actions are perceived as equitable and inclusive to all students. An environment that is perceived to be respectful can strengthen relationships between diverse groups, and promote retention of faculty and students at the university. Due to the possibility that a faculty can be accused of acts of discrimination, training is needed to sensitize faculty to differences in cultures and perspectives. Being cognizant of the fact that universities are social agents, the psychological climate of the school will inadvertently impact the wider community. Hence, faculty should promote tolerance for diverse group and respect for all.

The final element of the diversity climate to be discussed is the behavioral dimension. The behavioral dimension considers the interaction of diverse groups in class, clubs, and social interaction. Admittedly, you may have diverse representation on campus, but that does not necessarily mean that the different groups work together in an integrated way, towards a common goal. Within college classes, there exist students who are Black, White, Asian, Muslim etc; a professor is often challenged to find means to showcase the differences in cultures in efforts to positively influence the behavioral dimension. Hence faculty must seek to generate behaviors that promote diversity, and cross culture interaction in efforts to positively contribute to the diversity climate of the class.

Figure 1 depicts Hurtado, Milem, Clayton-Pedersen, and Allen (1999) interrelationship model of *“Elements influencing the climate for racial/ethnic diversity”* (p.4)

Figure 1. Elements influencing the climate for racial/ethnic diversity (Hurtado, Milem, Clayton-Pedersen, and Allen, 1999, p.4)



Prior to the start of the advance seminar or colloquium, doctoral students should be asked to read Hurtado, Milem, Clayton-Pedersen, and Allen (1999) “Enacting diverse learning environments: improving the climate for racial/ethnic diversity in higher education” among other texts. To generate students’ reflection about the reading, doctoral students should be asked to submit a reflection to the following questions: How can the diversity climates of a university impact faculty? How might the diversity climate differ among the following schools: an HBCU, a pre-dominantly white college and a religious university?

The writing assignment before the start of the advance seminar or colloquium, should seek to ignite students to consider challenges they may have as future faculty, based on the diversity climate of the school, and for students to reflect on how the diversity climate may be different pending the type of university they choose to work at. The writing assignment provides

an opportunity for doctoral students to express their perception of variance in the diversity climate pending the school, and will be used as a springboard for the class discussion on diversity climate in higher education.

At the beginning of class doctoral students will be asked to share their responses to the writing assignment: how can the diversity climates of a university impact faculty? Possible responses may consider challenges of assessment, hiring of new faculty, instructional strategies used (such as group work), social clubs in which to participate, etc.

After which, the discussion of the class will shift to Figure 1. Doctoral students should be asked: Is there a particular element(s) that is crucial to the diversity climate, or are all elements of equal significance? Additionally, they should be asked to justify their responses as to whether or not they agree with the unidirectional and bidirectional arrows. Their responses will draw attention to the bureaucracy of the university that may overshadow the campus climate for racial and ethnic diversity.

As a culminating exercise the doctoral students will be asked to participate in *Difficult Dialogues*. According to the University of Missouri *Difficult Dialogues* webpage (2015), the “Program activities provide an environment in which differing views are defended, heard, and considered by those who hold conflicting ideas and values across cultures.” *Difficult Dialogues* creates scenarios in which members of the audience can join the cast and change the outcome of the play. Initially, the audience observes the script unedited, and the second time, they are invited to join the play at anytime to change the outcome of the script. Hence, we proposed that the following difficult dialogues be enacted within a mathematics education context that reflects on employment decisions, class integration and being an agent of change at the university. Hence, the difficult dialogue should depict three themes: whom should we hire? How can we facilitate an integrated and diverse classroom community? And how can we be agents of change within the university?

During the first theme scenario, the cast should depict a search committee trying to decide on whom to hire for a mathematics education position. The candidates will be an African American woman and a White male. The White male is perceived to be more qualified; however the university is challenged to increased faculty diversity. The doctoral students will subsequently be asked to assist with this decision-making, and consider how their decision will influence the climate of structural diversity.

The second theme scenario should focus on promoting cross culture socialization within the class. The script should have a diversity of ethnicity, religion, and social status within the class. The faculty assigns group work but observes individual with similar race, and social class often chooses to work together. So the doctoral students should be asked to play the role of the professor in the script and find means to enhance the behavioral dimension of the climate of diversity in the class.

The third theme scenario should focus on the reenactment of the “Cotton Ball” incident at University of Missouri (Heavin, 2010), in which two young men threw cotton balls in front of the Black Cultural Center and subsequently went and rode the university’s symbolic tiger statue. Once the backdrop of the incidence is set, the cast will then consist of three faculty members who are sitting down for breakfast discussing the recent activities. One faculty would be laughing at the story and suggest that the students were just having fun, another faculty would comment that they should have a white cultural center to complement the black cultural center, while the third faculty states that he hopes this story go away because the school does not need “black drama”, and suggest that the students be removed from the university for this sole reason. Doctoral students should be asked to be a part of this difficult dialogue and extend the breakfast conversation. They should also be asked to consider the implication such an act can have on the psychological climate of diversity at the university and to recommend means to improve the psychological climate of diversity after the incident.

In closing the reading assignment, class activity and difficult dialogues scenarios will seek to promote an understanding of the elements of the diversity climate that exist at institutions of higher education. Having doctoral students' reflection on elements of diversity, an opportunity to participate in situations that may arise regarding diversity can increase their awareness of challenges of diversity that may exist. It is hoped that doctoral students in mathematics education will learn, that saying nothing regarding issues of diversity may actually communicate a message (a negative message) relative to the diversity climate at the university. Hence, this session is needed, because it will provide an opportunity for students to reflect on means that can facilitate the positive climate of diversity at their future place of employment.

### References

American Mathematical Society (AMS), 2014. *Annual Survey on Mathematical Sciences*.

Retrieved on October 16, 2015 from <http://www.ams.org/profession/data/annual-survey/2014Survey-SREC.pdf>

Bluford, L. H. (1959). The Lloyd Gaines story. *Journal of Educational Sociology*, 32(6), 242-246.

Colby, S. L., & Ortman, J. M. (2015). Projections of the size and composition of the U.S.

population: 2014 to 2060. Retrieved from

<http://www.census.gov/content/dam/Census/library/publications/2015/demo/p25-1143.pdf?>

Heavin, J. (2010, March 3). Two arrested in cotton ball incident. *Columbia Tribune*. Retrieved

from [http://www.columbiatribune.com/news/crime/two-arrested-in-cotton-ball-incident/article\\_d9781cd7-52ee-5f18-801b-a66de6d6720c.html](http://www.columbiatribune.com/news/crime/two-arrested-in-cotton-ball-incident/article_d9781cd7-52ee-5f18-801b-a66de6d6720c.html)

Hurtado, S., Milem, J., Clayton-Pedersen, A., & Allen, W. (1999). Enacting diverse learning environments: Improving the climate for racial/ethnic diversity in higher education.

*ASHE-ERIC Higher Education Report*, 26, 8.

Reys, R. E., & Dossey, J. A. (Eds.) (2008). *U.S. doctorates in mathematics education:*

*Developing stewards of the discipline*. American Mathematical Society in cooperation with Mathematical Association of America. Providence, Rhode Island.

Umbach, P. D. (2006). The contribution of faculty of color to undergraduate education. *Research in higher education*, 47(3), 317-345.

University of Missouri Difficult Dialogues (2015). Promoting pluralism and academic freedom on campus. Retrieved October 16, 2015 from <http://difficultdialogues.missouri.edu/>

Wilson, P. S., & Franke, M. (2008). Preparing teachers in mathematics education doctoral programs: Tensions and strategies. In R. E. Reys, & J. A. Dossey (Eds.), *U.S. doctorates in mathematics education: Developing stewards of the discipline* (pp. 103-109).

Providence, RI: American Mathematical Society.