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# Preservice Teachers' Disposition Self-Appraisals: Is There a Connection to Mathematics Instructional Practices?

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## Abstract

This paper explores preservice teachers' dispositions and the connection to mathematics instructional practices. The Theory of Culturally Relevant Pedagogy served as the theoretical grounding for the study. Hence, its three broad propositions: conceptions of self and others, social relations, and conceptions of knowledge structure the argument presented. The participants in the study are elementary preservice teachers enrolled in a post-baccalaureate alternative certification program. The full-time, accelerated program focuses on and is specifically designed for individuals committed to teaching in urban, high-poverty schools. A dispositions survey, open-ended narratives, and teaching observation rubric served as data sources for the qualitative study. Findings indicate a connection between dispositions and instructional practices; however, nuances existed between the components of culturally relevant pedagogy.

## Introduction

The field of psychology has long been engaged in unlocking the complexities of the human mind. In recent years, however, education scholars have attempted to understand the power of thought and its implications for teaching and learning. One might argue that the mind is the most prevailing facet of a human being. As the United States and its schools become more diverse, the notions that teachers hold about various student demographic groups becomes increasingly significant. The U.S. Census Bureau projects that by the year 2042 Whites will no longer make up the majority in the U.S. They estimate that by 2050 Whites will comprise 46% of the population, Hispanics 30%, African Americans 15%, and Asians 9%. The National Center for Education Statistics indicates that in 2003 U.S. public elementary and secondary schools were 58.7% White, 17.2% Black, and 18.5% Hispanic. In contrast, its teachers were 83.1% White, 7.9% Black, and 6.2% Hispanic (Strizek et al., 2006). These statistics highlight the fact that most Black and Hispanic children will be taught by a teacher that does not share their racial/ethnic background. In addition to being racially and culturally diverse, U.S. public schools are also linguistically and socioeconomically diverse. Nineteen percent of students speak a language other than English at home (Rooney, 2006). Further, the U.S. Census Bureau data reveals that 18% of children under eighteen years old are living in poverty.

With such demographics it is critical that preservice teachers be adequately prepared to provide effective, high-quality mathematics instruction to all students regardless of their race, ethnicity, gender, socioeconomic status, culture, or other characteristics. Now, more than ever equity in mathematics education is critically salient. Teachers must function as agents of change and challenge the pervasive societal belief that only some students are capable of learning mathematics. They must hold high expectations for all students and challenge the implicit, often unspoken, notion that only the experiences of some students are valuable and reflect mathematical knowledge. The lived experiences, prior knowledge, intellectual strengths, and personal interests of all students should be valued and utilized as a springboard for learning. Therefore, mathematics teachers must reconceptualize the nature of students' mathematical knowledge, bridging informal and formal mathematical experiences, and providing students opportunities to demonstrate their understanding of mathematics in a multitude of ways. If these goals are to be met, it is important that teachers hold excellence-oriented views toward all students and those views are explicitly reflected in all aspects of the mathematics teaching and learning process – instructional planning, decision making, practices, and classroom community.

Given the critical significance of reaching all mathematics learners, this study sought to examine the connection between preservice teachers' disposition self-appraisals and their mathematics instructional practices. In essence, are the views teachers express congruent with what they do in the classroom?

## Theoretical Framework

The Theory of Culturally Relevant Pedagogy (Ladson-Billings, 1995) served as the theoretical grounding for framing elementary preservice teachers' self-appraisals of their dispositions. Ladson-Billings asserts that culturally relevant teachers exhibit the following broad qualities with respect to the underlying propositions: (a) Conceptions of self and others suggests that culturally relevant teachers hold high expectations for all students and believe all students are capable of achieving academic excellence; (b) social relations infers that culturally relevant teachers establish and maintain positive teacher-student relationships and classroom learning community as well as are passionate about teaching and view it as a service to the community; and (c) conceptions of knowledge suggests that culturally relevant teachers view knowledge as

fluid and facilitate students' ability to construct their own understanding. Ladson-Billings' work provides a context for illuminating instructional practices that facilitate the academic success and cultural competence of traditionally underserved student populations. Hence, it is salient for the goal of the study.

### Methodology

The fourteen participants in the study are elementary preservice teachers enrolled in a post-baccalaureate alternative certification program. The full-time, accelerated program focuses on and is specifically designed for individuals committed to teaching in urban, high-poverty schools.

A dispositions survey, open-ended narratives, and teaching observation rubric served as data sources for the study. All three sets of data were collected during the same semester. The dispositions survey utilized in the study is a component of the program assessment preservice teachers complete at the end of their program. The disposition items on the survey are based on the Interstate New Teacher Assessment and Support Consortium (INTASC) Standards. Preservice teachers are asked to self-rate their demonstrated level of knowledge on a scale of 1 to 5 with 1 being not demonstrated; 2 - basic; 3 - developing; 4 - proficient; and 5 - advanced. For this purpose of this study the disposition items were categorized and analyzed with respect to the broad propositions of culturally relevant pedagogy: conceptions of self and others, social relations, and conceptions of knowledge. See table 1.

Table 1. Disposition Items aligned with Culturally Relevant Pedagogy

<i>Proposition: Conceptions of Self and Others</i>			<i>Rating</i>		
	Not Demonstrated 1	Basic 2	Developing 3	Proficient 4	Advanced 5
I value the individual differences among all students and accommodating these differences to fulfill the learning needs of all students.					
I value human diversity, respect students' varied talents and perspectives, and show sensitivity to community and cultural norms.					
I value personal reflection in my development.					

  

<i>Proposition: Social Relations</i>			<i>Rating</i>		
	Not Demonstrated 1	Basic 2	Developing 3	Proficient 4	Advanced 5
I value an environment in which students have clear expectations and in which time and space in the classroom are managed to ensure student engagement.					
I value the many ways in which people seek to communicate and values responsive listening.					
I value relationships with school colleagues, parents, agencies, and the community.					

  

<i>Proposition: Conceptions of Knowledge</i>			<i>Rating</i>		
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	Not Demonstrated 1	Basic 2	Developing 3	Proficient 4	Advanced 5
I value the need for using appropriate materials, for linking the curriculum to the students' prior learning, and for using an interdisciplinary approach and methods central to the discipline.					
I value the development of students' critical thinking, independent problem solving and performance capabilities.					
I value planning as a short and long term collegial activity open to revision.					
I value the need for assessment of students' learning, and regularly use assessment evidence in making decisions in my instruction.					

The open-ended narratives generated information about participants' views of mathematics teaching and learning as it relates to specific student demographic groups. The nature of the questions reflected the broad propositions of culturally relevant pedagogy. Participants provided a written response to the following open-ended questions:

- (a) Education statistics indicate a disparity in the mathematics achievement of Black, Hispanic, and White students in U.S. schools. Why do you believe this disparity exists?
- (b) Education statistics also indicate a disparity in the mathematics achievement of low income and middle/high income students in U.S. schools. Why do you believe this disparity exists?
- (c) Some educators suggest that low income students better learn mathematics in an environment that is teacher-centered, emphasizes direct instruction, procedural understanding, and seatwork. Do you agree or disagree with this position? Why?
- (d) Some educators also suggest that low income and minority students do not possess significant mathematics cultural capital. That is, they do not bring valuable out-of-school experiences and mathematics informal knowledge to the teaching and learning process. Do you agree or disagree with this position? Why?

Participants' mathematics instructional practices were documented via a teaching observation rubric during their student teaching experience. Participants were observed six times over a period of one semester. The indicators on the teaching observation rubric are based on the INTASC standards. See table 2.

Table 2. Field-Based Teaching Observation Rubric

INTASC STANDARDS	PROFICIENT	DEVELOPING	BASIC	UNSATISFACTORY
<b>Standard 1:</b> <b>Knowledge of Subject Matter</b> <b>Standard 7:</b> <b>Instructional Planning Skills</b>	Teacher candidate displays extensive content knowledge and makes connections between the content and other parts of the discipline and other disciplines. Instruction effectively promotes student	Teacher candidate displays solid content knowledge and makes some connections between the content and other parts of the discipline and other disciplines. Instruction moderately promotes student	Teacher candidate displays general content knowledge but cannot articulate connections with other parts of the discipline or with other disciplines. Instruction minimally promotes student	Teacher candidate makes content errors or does not correct content errors students make. Instruction does not promote student conceptual understanding. Learning activities and/or instructional materials are not suitable to students

	conceptual understanding. Learning activities and/or instructional materials are highly relevant to students and instructional goals. They progress coherently, producing a unified whole and reflect best practices.	conceptual understanding. Most of the learning activities and/or instructional materials are suitable to students and instructional goals. Most activities reflect best practices.	conceptual understanding. Some of the learning activities and/or instructional materials are suitable to students and instructional goals. Some activities reflect best practices.	and instructional goals. Activities do not reflect best practices.
<b>Standard 2: Knowledge of Human Development and Learning</b> <b>Standard 3: Adapting Instruction for Individual Needs</b> <b>Standard 4: Multiple Instructional Strategies</b>	All instructional goals and activities are developmentally appropriate. Pacing is appropriate throughout the lesson. Teacher candidate displays thorough knowledge of students' skills and needs and utilizes a variety of instructional strategies, manipulatives, and resources. Instructional practices and interactions consistently reflect high expectations for all learners. Candidate consistently and effectively scaffolds student learning, encourages students to articulate their thinking, probes incorrect or off target responses, and uses errors as a springboard for learning.	Most instructional goals and activities are developmentally appropriate. Pacing is appropriate during most of the lesson. Teacher candidate displays solid knowledge of students' skills and needs and utilizes some variety in instructional strategies, manipulatives, and resources. Instructional practices and interactions moderately reflect high expectations for all learners. Candidate, in most instances, scaffolds student learning, encourages students to articulate their thinking, probes incorrect or off target responses, and uses errors as a springboard for learning.	Only some instructional goals and activities are developmentally appropriate. Pacing is appropriate during some of the lesson. Teacher candidate displays general knowledge of students' skills and needs and utilizes minimal variety in instructional strategies, manipulatives, and resources. Instructional practices and interactions minimally reflect high expectations for all learners. Candidate, in some instances, scaffolds student learning, encourages students to articulate their thinking, probes incorrect or off target responses, and uses errors as a springboard for learning.	Instructional goals and activities are not developmentally appropriate. Pacing is inappropriate. Teacher candidate displays minimal knowledge of students' skills and needs and does not utilize variety in instructional strategies, manipulatives, and resources. Instructional practices and interactions do not reflect high expectations for all learners. Candidate does not scaffold student learning, encourages students to articulate their thinking, probes incorrect or off target responses, and uses errors as a springboard for learning.

<b>Standard 5: Classroom Motivation and Management</b>	Management system and response to student misbehavior are highly effective and consistent. Transitions, routines, and classroom procedures are well established and highly effective. Strategies to ensure all students are actively engaged are well established and utilized consistently. All learners are on task during the lesson.	Management system and response to student misbehavior are effective and consistent most of the time. Transitions, routines, and classroom procedures are established and effective in most instances. Strategies to ensure all students are actively engaged are moderately established and utilized most of the time. Most learners are on task during the lesson.	Management system and response to student misbehavior are moderately effective and consistent some of the time. Transitions, routines, and classroom procedures are effective in some instances. Strategies to ensure all students are actively engaged are minimally established and utilized some of the time. Only some learners are on task during the lesson.	Management system and response to student misbehavior are ineffective and inconsistent. Transitions, routines, and classroom procedures are not established and ineffective. Strategies to ensure all students are actively engaged are not established and utilized. Learners are not on task during the lesson.
<b>Standard 6:</b>	Teacher candidate	Teacher candidate	Teacher candidate	Teacher candidate

<b>Communication Skills</b>	consistently poses high level questions that promote student thinking. Teacher candidates' dialogue and interactions consistently demonstrate high expectations, genuine caring, and respect. Both verbal and non-verbal communication is always positive.	moderately poses high level questions that promote student thinking. Teacher candidates' dialogue and interactions moderately demonstrate high expectations, genuine caring, and respect. Verbal and non-verbal communication is generally positive.	minimally poses high level questions that promote student thinking. Teacher candidates' dialogue and interactions minimally demonstrate high expectations, genuine caring, and respect. Verbal and non-verbal communication is somewhat positive.	moderately poses high level questions that promote student thinking. Teacher candidates' dialogue and interactions do not demonstrate high expectations, genuine caring, and respect. Verbal and non-verbal communication is not positive.
<b>Standard 8: Assessment of Student Learning</b>	Teacher candidate effectively monitors student learning and makes appropriate modifications during the lesson, based on student responses and feedback. Assessment is congruent with instructional goals, and stated in clear and measurable terms.	Teacher candidate moderately monitors student learning and makes some modifications during the lesson, based on student responses and feedback. Assessment is moderately congruent with instructional goals, but could be strengthened.	Teacher candidate minimally monitors student learning and makes few modifications during the lesson, based on student responses and feedback. Assessment is minimally congruent with instructional goals.	Teacher candidate does not monitor student learning or make modifications during the lesson, based on student responses and feedback. Assessment is not congruent with instructional goals.

### Findings and Discussion

The broad propositions of culturally relevant pedagogy served as the lens for organizing and analyzing the data sets. Hence, the participants' disposition self ratings, open-ended responses, and instructional snapshots were logged, chunked, and coded along the following themes: conceptions of self and others, social relations, and conceptions of knowledge. Analyses of data sets followed the schema reflected in table 3.

Table 3. Analyses Schema

	Disposition Self-Ratings	Open-Ended Narratives	Instructional Snapshots
	Ratings logged (1 to 5)	Responses chunked and coded	Practices chunked and coded
Conceptions of Self and Others	I value the individual differences among all students and accommodating these differences to fulfill the learning needs of all students. I value human diversity, respect students' varied talents and perspectives, and show sensitivity to community and cultural norms.  I value personal reflection in my development.	Education statistics indicate a disparity in the mathematics achievement of Black, Hispanic, and White students in U.S. schools. Why do you believe this disparity exists?  Education statistics also indicate a disparity in the mathematics achievement of low income and middle/high income students in U.S. schools. Why do you believe this disparity exists?	INTASC Standard 2: Knowledge of Human Development and Learning  INTASC Standard 3: Adapting Instruction for Individual Needs  INTASC Standard 4: Multiple Instructional Strategies
Social Relations	I value an environment in which students have clear expectations and in which time and space in the classroom are managed to ensure student engagement.	Some educators suggest that low income students better learn mathematics in an environment that is teacher-	INTASC Standard 5: Classroom Motivation and Management

	<p>I value the many ways in which people seek to communicate and values responsive listening.</p> <p>I value relationships with school colleagues, parents, agencies, and the community.</p>	<p>centered, emphasizes direct instruction, procedural understanding, and seatwork. Do you agree or disagree with this position? Why?</p>	<p>INTASC Standard 6: Communication Skills</p> <p>INTASC Standard 10: Partnerships</p>
Conceptions of Knowledge	<p>I value the need for using appropriate materials, for linking the curriculum to the students' prior learning, and for using an interdisciplinary approach and methods central to the discipline.</p> <p>I value the development of students' critical thinking, independent problem solving and performance capabilities.</p> <p>I value planning as a short and long term collegial activity open to revision.</p> <p>I value the need for assessment of students' learning, and regularly use assessment evidence in making decisions in my instruction.</p>	<p>Some educators also suggest that low income and minority students do not possess significant mathematics cultural capital. That is, they do not bring valuable out-of-school experiences and mathematics informal knowledge to the teaching and learning process. Do you agree or disagree with this position? Why?</p>	<p>INTASC Standard 1: Knowledge of Subject Matter</p> <p>INTASC Standard 7: Instructional Planning Skills</p> <p>INTASC Standard 8: Assessment of Student Learning</p>

Findings indicate that nine participants rated themselves as advanced or proficient on 10 out of 10 dispositions items. The remaining five participants rated themselves as developing or basic on at least 8 out of 10 disposition items. For the purpose of discussing patterns across the data sets the aforementioned nine participants were grouped together and labeled as the green cluster. Similarly, the other five participants were grouped together and labeled as the yellow cluster.

Cross analyses of participants' disposition self-ratings, open-ended narratives and instructional snapshots indicates that a connection exists between self-ratings and field-based practices. Preservice teachers reporting high levels of dispositional competency (green cluster) tended to assert equity-oriented views about mathematics teaching and learning in their narratives. This also held true for individuals reporting moderate levels of dispositional competency (yellow cluster). Overall, both groups' narratives reflected perspectives congruent with the broad propositions of culturally relevant pedagogy: conceptions of self and others, social relations, and conceptions of knowledge.

Differences between the two clusters were revealed, however, with the instructional snapshots. Along the propositions conceptions of self and others and social relations slight variations in mathematics instructional practices existed between the green and yellow clusters. Though the practices of the groups were similar, individuals in the green cluster netted slightly more instances of practices that were coded as culturally relevant. Within the proposition conceptions of knowledge, however, the variation was more pronounced. Participants reporting high levels of dispositional competency (green cluster) yielded twice the number of instances of practices that were coded culturally relevant as did individuals reporting moderate dispositional competency (yellow cluster). For example, participants in the yellow cluster consistently received positive feedback regarding the extent to which they used frames of reference salient to students within the mathematics teaching and learning process. Similarly, they were more adept at using students' out-of-school experiences to make mathematical connections and promote conceptual understanding.

These findings indeed suggest that there is a connection between teachers' dispositions self-appraisals and their mathematics instructional practices. Particularly interesting is the noted distinction between the different components of culturally relevant pedagogy. It is striking that individuals with differing levels of dispositional competency compare similarly along the propositions conceptions of self and others and social relations, but vary significantly with



respect to conceptions of knowledge. This distinction is interesting and worthy of further exploration in a subsequent study. This study reemphasizes the importance of mathematics teacher educators creating disequilibrium in their mathematics methods courses, assignments, and field experiences --- disequilibrium that challenges preservice teachers to critically examine their views of mathematics teaching and learning as it relates to students of color, students living in poverty, and students for whom English is a second language. Further, it illuminates the perspective that good intentions are simply not enough. While caring and affirming views are certainly requisites of a culturally relevant teacher, those affective attributes must be coupled with excellence-oriented, culturally relevant instructional practices.

For equity to be achieved, the mathematics education community as an entirety must be committed to the mathematics excellence of *all* students. That commitment must extend beyond rhetoric and slogans to action which facilitates the accomplishment of that in which we say we believe. In essence, do we have the will?

### References

- Ladson-Billings, G. (1995). Towards a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32(3), 465-491.
- NCES Common Core of Data (CCD), *Public Elementary/Secondary School Universe Survey, 1993-94, 2000-02, and 2003-04*. Washington, D.C: National Center for Education Statistics.
- Rooney, P. (et al). (2006). The Condition of Education 2006. *National Center for Education Statistics Publication #2006071*. Washington, D.C: National Center for Education Statistics.
- 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 2006-313 Revised). U.S. Department of Education, National Center for Education Statistics. Washington, D.C: U.S. Government Printing Office.