



An Examination of "Well-prepared" Urban Science Teachers: Teacher Preparation as Identity Work

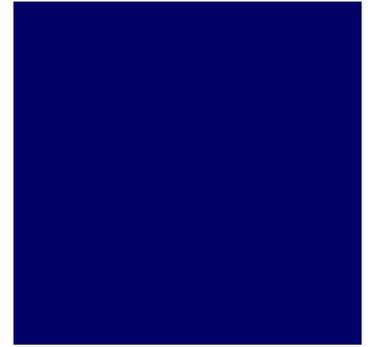
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Problem



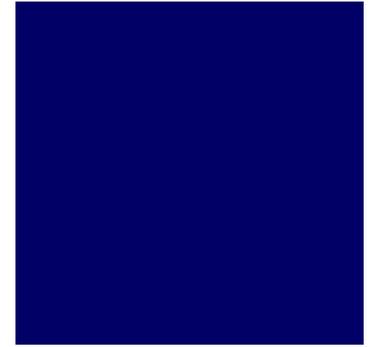
- High rates of attrition for secondary science teachers in urban schools (National School Shortage Staffing List, 2016)
- Why do teachers stay in urban schools? Social justice perspectives on commitment
 - More than just a teacher; dedicated to working with underserved students and creating change (e.g. Picower, 2012)
- What about science teachers and social justice?
 - Disciplinary values, eg. objectivity/neutrality (e.g. Sondel, et al., 2017)

Research Question



- *How do teachers integrate social justice perspectives into their science teaching beliefs and practices?*

Research Context



“Urban Science Teacher Preparation” program (USTP)

- M. Ed. program for urban secondary science teaching

Program Structures

- Cohort model
- Induction support/ participation in research
- Social justice mission
 - Multiculturalism, diverse learners
 - Structural critique

Sociocultural Framework of Identity

(Gee, 2000)

- Identity is social, relational, and contextually bound
- Multidimensional and dynamic

Dimension	Definition
Nature (N)	The innate, or natural, characteristics of a person, including an individual's gender, race, cultural background, etc.
Discourse (D)	Aspects of an individual's identity that are defined through discourse, or through talking and interaction.
Institutional (I)	Aspects of an individual's identity imparted by their role in an organization
Affinity (A)	Aspects of an individual's identity related to engaging in shared communal practices.

Methods

Longitudinal Case Study (Yin, 2013)

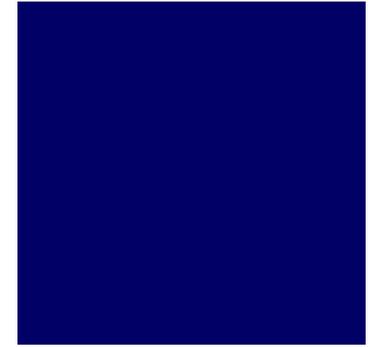
- USTP, critical case (Yin, 2013)
 - 1 cohort (3 out of 4 teachers)
- 3 years

Narrative Inquiry Methodology (Clandinin & Connelly, 1999)

What does it mean to be an urban science teacher?

- Data: 7 individual interviews, 4 lesson plans and written reflections
- Analyses:
 1. *Inductive: coding scheme based upon identify (ICC=95%)*
 2. *Deductive: "over-reading" (Ayers, et al., 2003)*

Methods: Participants



Teacher*	Gender	Race/ Ethnicity	Language status	Undergraduate Major	School type	Teaching position
Alan	Male	White	Bilingual	Geosciences (Minor Biology)	Alternative, Public high school	Biology; Forensics, Oceano- graphy
Felicia	Female	Black	Bilingual	Biology Psychology	Charter middle school	8 th grade science
Gabriel	Male	White	Monolingual	Chemistry	Public high school	Chemistry, SEI Chemistry

* All names are pseudonyms

Findings: Overview

Dimension	Theme
Nature	Contending with their “outsider” status.
Discourse	Shifting understandings of teaching science for social justice.
Institutional	Encountering barriers in urban schools.
Affinity	Legitimizing and sustaining their identities through USTP.

Nature

Contending with their
“outsider” status.

Pre-Service

Personal introspection on the identities they bring to the science classroom.

- **Alan:** *I am a white male in an urban school with predominantly immigrant students and students of color. So it was just a moment for me of realizing, I guess, my background and my history and what I'm bringing into the school, and what the students are bringing.*
- **Felicia:** *Growing up in Jamaica—I kind of did buy into the idea of, if you work hard, you'll get where you need to be, because ...that's my experience and it was an all-Black nation, so I was like, "Okay, what's wrong with people over here?"*

Nature

Contending with their
“outsider” status.

In-service

Reflecting on their position relative to their teaching context.

- **Alan:** *Equality is not for them, trying to meet the same standards, the same curriculum, it's meeting them where they're at. ... Last year I would have said "no if we lower the bar or decrease the rigor we're lowering the bar for the students!" and what I'm realizing is no, it's a totally different ball game.*
- **Felicia:** *I was at a loss as to how to enact discipline within the framework of the school, because the school is traditionally African American where the adult is the absolute authority... I kind of took a step back because I was like "OK well, is this me? Is this how I want to be? Is this the type of discipline that I intend to use?" ...and I just kind of started soul searching...*

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Discourse

Shifting understandings of teaching science for social justice.

Pre-Service

Science teaching is more than science content expertise.

- **Alan:** *...the biology's there, but you're also doing...you're doing therapy, you're doing mentoring, you're doing college prep...you play, many more roles than just your typical teacher.*
- **Felicia:** *I think, my pedagogy is shifted to...me kind of coming in with like all these different kind of tools in my arsenal, and kind of using them for different kids to kind of draw them in.*

Discourse

Shifting understandings of teaching science for social justice.

In-Service

Balancing content and student needs/relevance.

- **Alan:** *I always tell my colleagues in English and history because they can read a poem, **there is more humanity in those subjects**. We made history, we made books, they're human activities, **whereas science is about natural phenomemon, which is not as relevant to everyday life like the civil rights movement might be**. So the key thing I do every day as a science teacher is make it relevant.*

Discourse

Shifting understandings of teaching science for social justice.

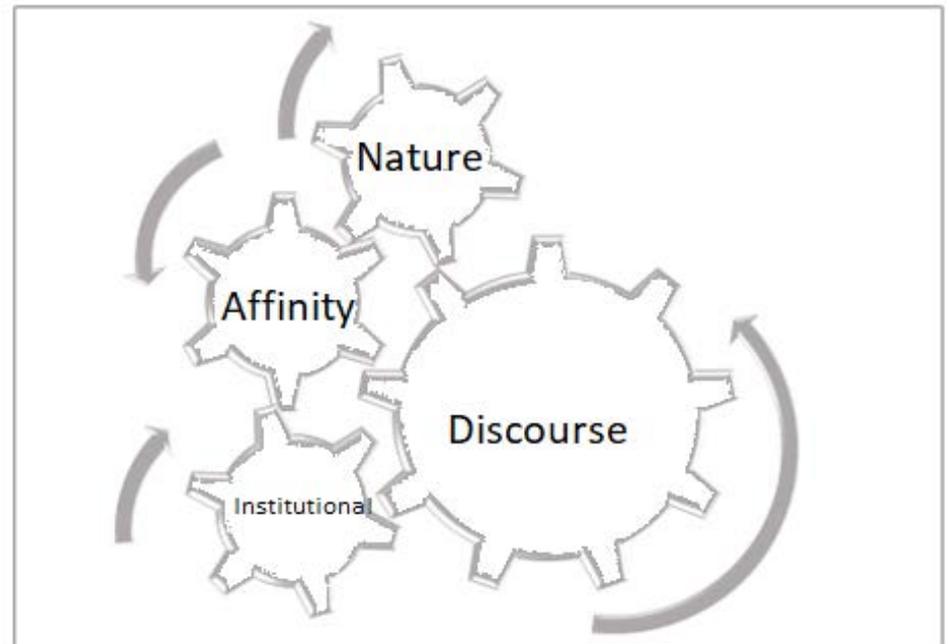
In-Service

Balancing content and student needs/relevance.

- **Felicia:** *...students were able to engage in talking about a superhero who looked like them and was celebrating African ancestry and culture. This gave them more of a buy in as they could see themselves represented in a positive way on the big screen, with characters that were engaging in science practices and the development of technology.*

Conclusion

- Teachers engaged in sustained identity work through reflection (Luehmann, 2007)
- Science was prominent in their identity work
- More social justice connections through individual relationships with students; had more difficulty making science and social justice connections



Implications



- Teacher education programs have an important role to play in the development of science teachers of social justice
 1. Ideological clarity (Bartolomé & Balderrama, 2001) – integrating science and social justice
 2. Social legitimacy (Kamens, 1977) – being a particular kind of science teacher
 3. “Science identity” – reflect on nature of science

Thank You!

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