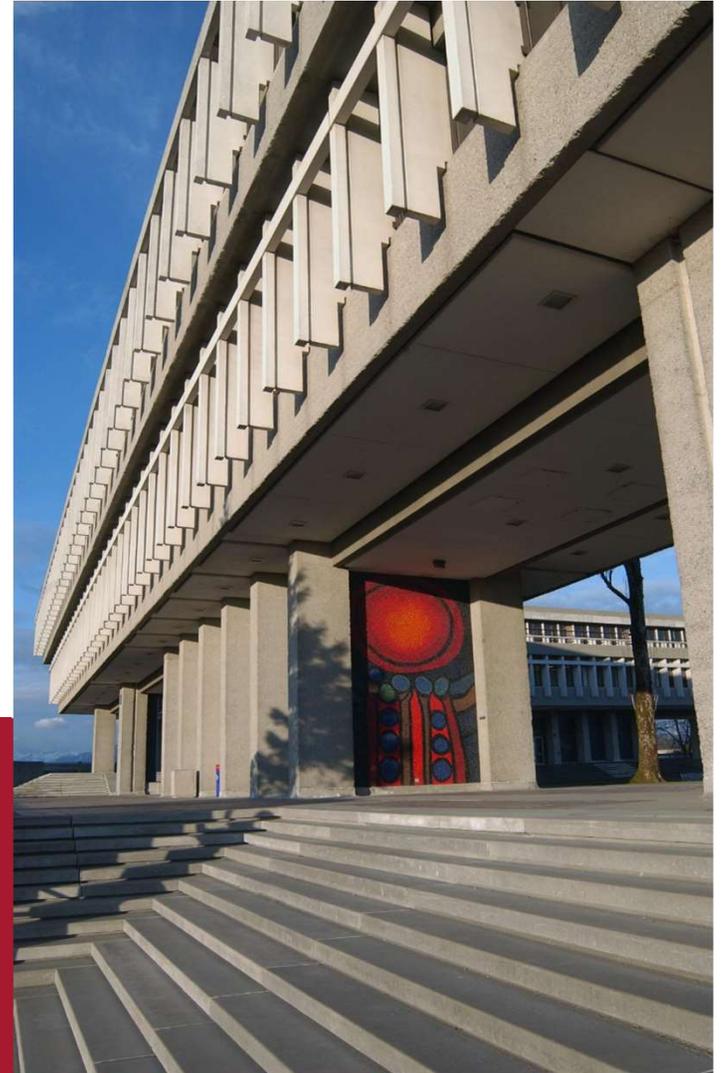




SIMON FRASER UNIVERSITY
ENGAGING THE WORLD

Tensions in Teaching Mathematics

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Tensions in Teaching Mathematics

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Tensions?

What tensions do mathematics teachers experience?

How do teachers cope with tensions?

What effect does this have on their mathematics teaching practice and professional growth?

Tension is described variously in research as:

~deliberating about alternatives rather than making choices~
(Nicol, 1997)

~a situation in which a perfect solution is not available~
(Katz & Rath, 1992)

~striving to attain competing, worthwhile aims~
(Ball, 1993)

Tensions:

- are endemic to the teaching profession
- encompass the inner turmoil teachers experience when faced with contradictory alternatives for which there are no clear answers
- are not problems to be solved - they result in good-enough compromises, not neat solutions

Berlak and Berlak (1981)

identified sixteen dilemmas for the purpose of illuminating the relationship between everyday school events to broader social, economics, and political issues

Lampert (1985)

teachers are dilemma managers who accept conflict as endemic and even useful to practice rather than as a burden that needs to be eliminated

Adler (1998)

the language of tensions is “a powerful explanatory and analytic tool, and a source of praxis for mathematics teachers.” (p. 26)

Berry (2007)

- utilized the notion of tension as a framework for both undertaking and analyzing her research
- The result was twelve tensions expressed as dichotomous pairs that “*capture the sense of conflicting purpose and ambiguity held within each*” (Berry, 2007, p. 120)
- Noting that these tensions do not exist in isolation, she used their interconnectedness as a lens to examine her practice

Berry's Tension Framework:

1. Telling and growth

- between informing and creating opportunities to reflect and self-direct

Berry's Tension Framework:

1. Telling and growth

2. Confidence and uncertainty

- between exposing vulnerability as a teacher educator and maintaining prospective teachers' confidence in the teacher educator as a leader.

Berry's Tension Framework:

1. Telling and growth
2. Confidence and uncertainty
3. Safety and challenge

- between a constructive learning experience and an uncomfortable learning experience.

Berry's Tension Framework:

1. Telling and growth
2. Confidence and uncertainty
3. Safety and challenge
4. Action and intent

- between working towards a particular ideal and jeopardising that ideal by the approach chosen to attain it.

Berry's Tension Framework:

1. Telling and growth
2. Confidence and uncertainty
3. Safety and challenge
4. Action and intent
5. Valuing and reconstructing experience

- between helping students recognise the 'authority of their experience' and helping them to see that there is more to teaching than simply acquiring experience.

Berry's Tension Framework:

1. Telling and growth
2. Confidence and uncertainty
3. Safety and challenge
4. Action and intent
5. Valuing and reconstructing experience
6. Planning and being responsive

- between planning for learning and responding to learning opportunities as they arise in practice

Framework:

1. Telling and growth
2. Confidence and uncertainty
3. Safety and challenge
4. Action and intent
5. Valuing and reconstructing experience
6. Planning and being responsive

Research Question:

Can I identify tension pairs within a
teacher's mathematics practice?

Methodology:

Naomi

- participant on my District Learning Team
- two classroom observations
- two interviews

Analysis:

Telling and Growth

- values hands-on, collaborative activities where students talk and work through things together to come up with many different ways to do things
- tension arises when she is faced with students who are not accustomed to being taught this way and finds herself reverting back to “old school” teaching

*neither managed nor resolved, this tension
became an impetus for change*

Analysis:

Confidence and Uncertainty

- initially she hid her struggles with math from her students
- eventually she felt compelled to reveal her uncertainty deciding “maybe it would be okay if they knew”

her tension is not resolved but it is managed

Analysis:

Action and Intent

- aware that her teaching style requires the use of formative assessment
- yet her reliance on summative assessment creates tension

another tension in which seeking professional growth is seen as part of the outcome in resolution

Research Implications:

My results indicate that unlike prior research on tensions, teachers do not simply manage these opposing forces but also work at, and seek help in, resolving them.

- Which tensions drive teachers to seek professional growth opportunities?
- Can tensions be effectively recreated in a professional development setting as a catalyst for professional growth?

Future Directions:

1. limitation in applying Berry's (2007) framework
 - tensions emerged that do not fit within the prescribed categories
 - *considering Festinger's Cognitive Dissonance theory, Harel's positioning theory and/or discourse analysis*
2. beneficial to consider further categorizing the tensions according to whether they are personal or pedagogical tensions, or possibly conflicts from external, systemic influences
 - *considering moving away from binary dichotomies*