



A PEDAGOGY OF PLACE: PROMOTING RELATIONAL KNOWLEDGE IN SCIENCE TEACHER EDUCATION

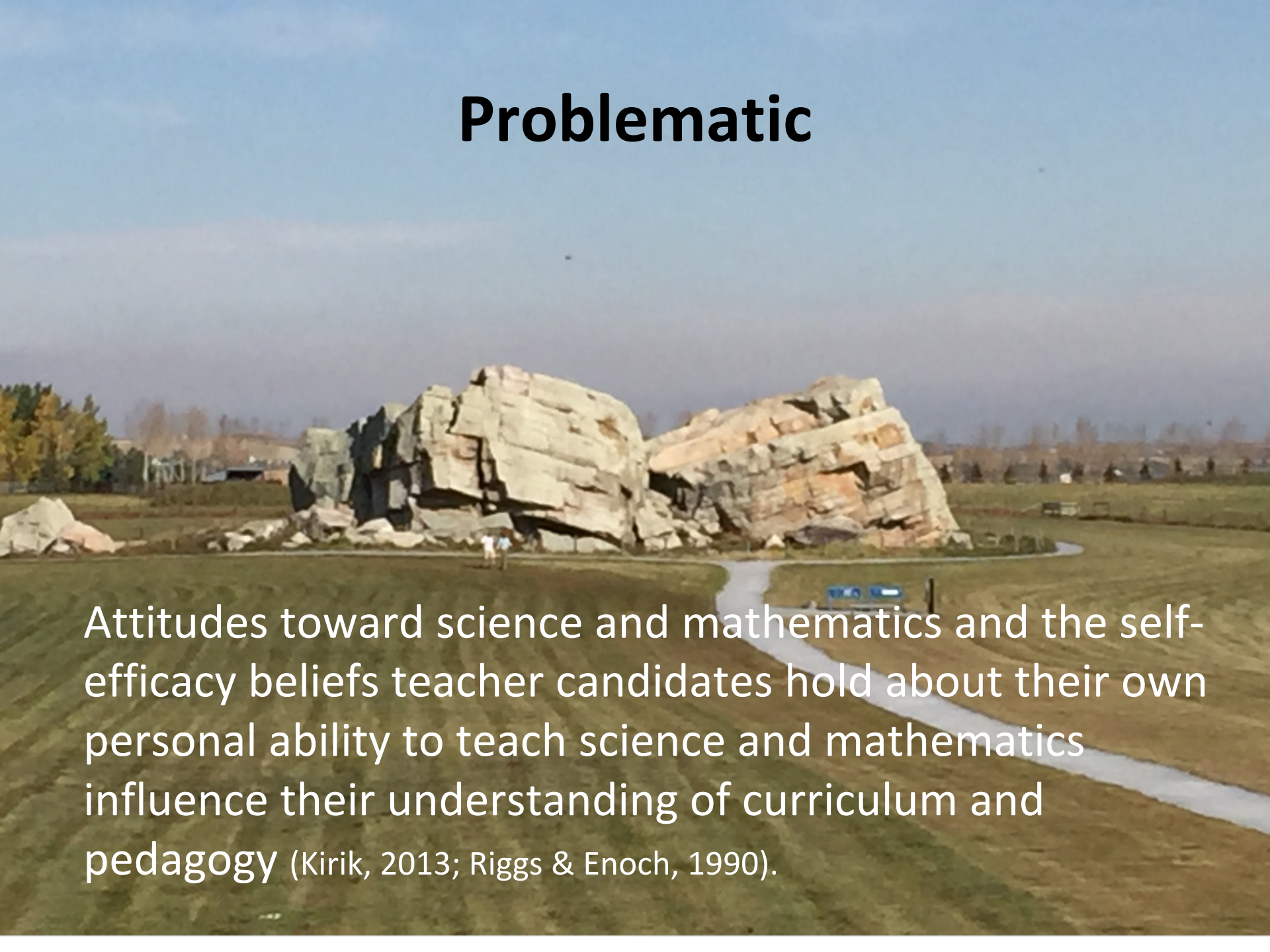
GLOBE 2017

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Problematic

Teacher candidates often feel unprepared to teach science and mathematics because they have little content and conceptual knowledge in science and mathematics because of a lack of exposure or negative school science and mathematics experiences (Banilower et al., 2013; Fulp, 2002; Mantzicopoulos et al., 2008).

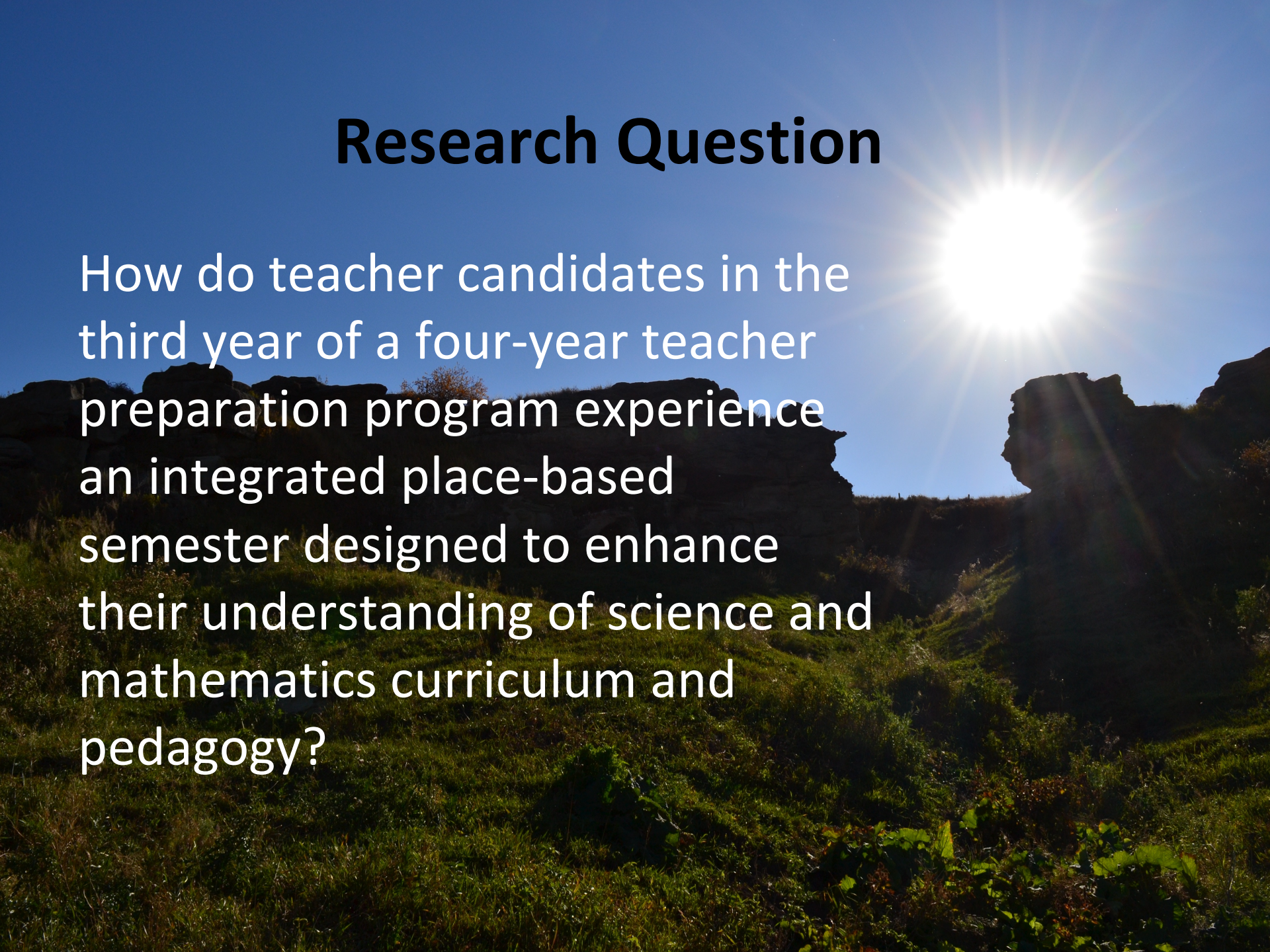
Problematic

A landscape photograph of a golf course. In the background, there are large, layered rock formations. A winding path or stream flows through the green grass in the foreground. The sky is a clear, light blue.

Attitudes toward science and mathematics and the self-efficacy beliefs teacher candidates hold about their own personal ability to teach science and mathematics influence their understanding of curriculum and pedagogy (Kirik, 2013; Riggs & Enoch, 1990).

Research Question

How do teacher candidates in the third year of a four-year teacher preparation program experience an integrated place-based semester designed to enhance their understanding of science and mathematics curriculum and pedagogy?



Place-based Thinking

‘Place’ can be described as “fragments of human environments where meanings, activities and a specific landscape are all implicated and enfolded by each other” (Relph, 1992, p. 37)



‘Place-based Education’ is grounded in the context of community, both natural and social (Penetito, 2009; Raffan, 1995; Theobald & Curtiss, 2000)

The content is specific to the geography, ecology, sociology, politics, and other dynamics of that place (Gruenewald, 2003; Woodhouse & Knapp, 2000)



“In a curriculum of place, young people or novices grow into knowledge through engagement in hands-on activities learning side-by-side with masters of the crafts. This knowledge enables people to find their way in that place where they dwell and this knowledge and these skills endow them with identity”

(Chambers, 2008, p. 120)



Overview

- ▣ 4-year Bachelor of Education program

Fall of 2015 & 2016 semesters, 3rd year cohort

Integrated sections of:

- ▣ EDUC 3106/3108-Program of Studies Curriculum Instruction in **Science**/**Mathematics** (*7 weeks full-time intensive courses on campus*)
- ▣ EDUC 3010-Practicum 1 (*6 weeks full-time in schools*)

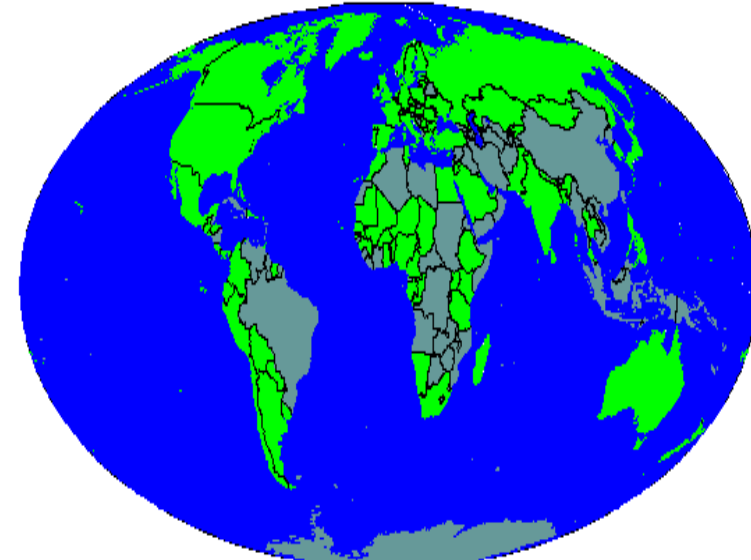




Science activities include environmental assessments in the fields of:

- Atmosphere, Biosphere, Hydrosphere, and Pedosphere;
- Collecting and Reporting Data;
- Creating Maps and Records that describe traditional lands and uses; and
- Collaborating with Community Members, Elders, Environmental Monitors, other Teachers, Students, and Scientists.

GLOBE countries in green



Alternative Pedagogies

- Integrated curriculum and pedagogy courses
- Community-based field studies
- School-based seminars in practicum

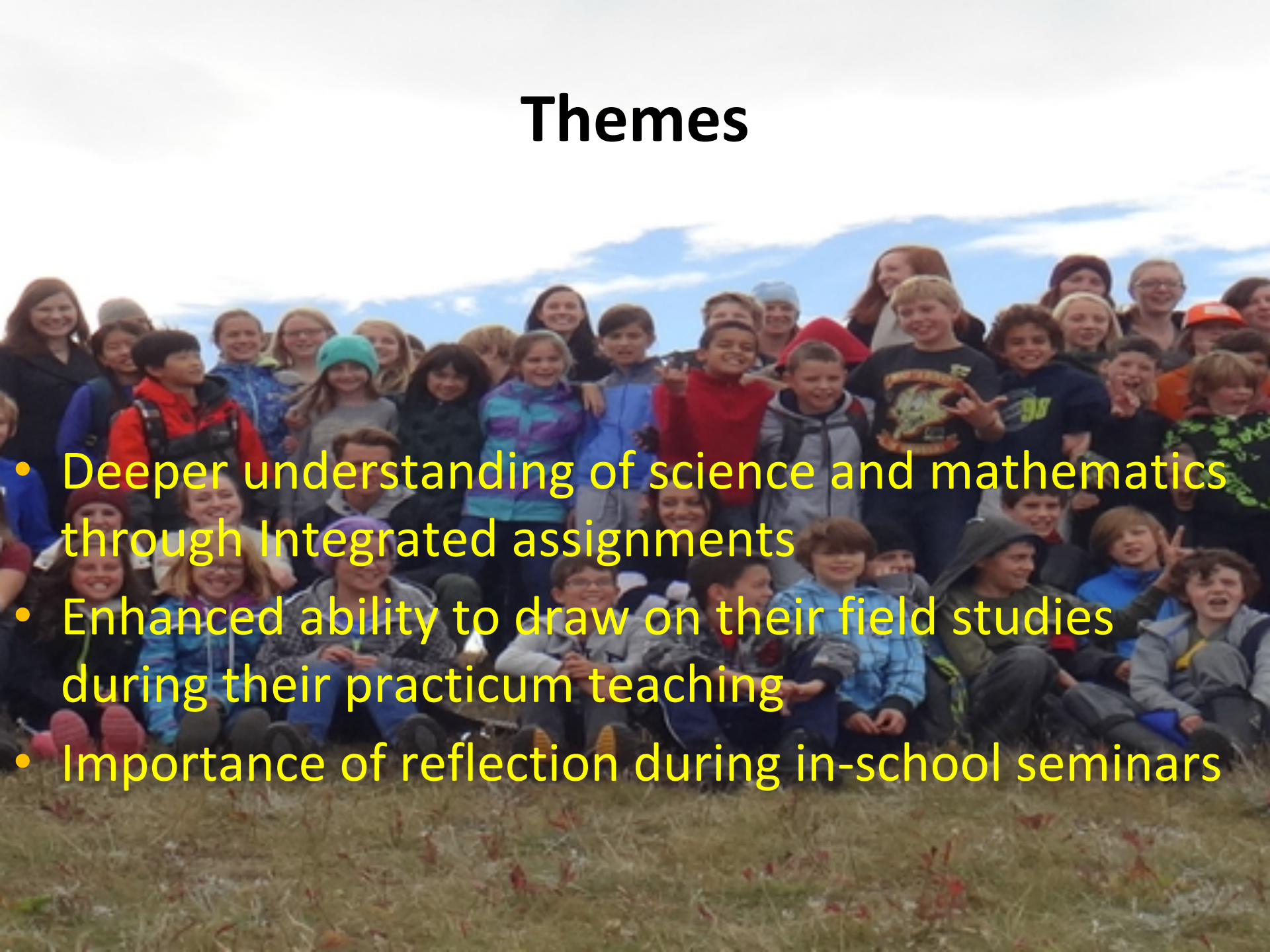


Methodology

- Qualitative Study
- 53 Teacher Candidates
- Class assignments; Mid-term interviews with 9 TCs; Final interviews with 11 TCs



Themes

- 
- Deeper understanding of science and mathematics through Integrated assignments
 - Enhanced ability to draw on their field studies during their practicum teaching
 - Importance of reflection during in-school seminars

Integrated Assignments

- *It forced you to do that reflective piece...and I have boxes in my brain. I have a Language Arts box and I am starting to realize that I can't just have boxes because things don't fit into one or the other, you can have bits of everything.* (Interview 6, April 18, 2016)

- **Others spoke about the challenge to integrate disciplines becoming easier because of attention to student learning:**

“At first, it seems a little silly because we are, ‘Oh we have to integrate all this stuff and this is really difficult,’ but if you look at a classroom you are integrating everything all day long” (Interview 7, April 21, 2016).



Field Studies

- *It was going out into the field [study that helped me connect theory and practice] because I began to realize that it doesn't have to be [direct teaching]" (Interview 6, April 18, 2016).*
- *I loved the integration of the [field study] experience. I thought that was very valuable. It gave us a first-hand view of inquiry learning. It gave us a first-hand experience with kids and that it is okay that it is a little bit messy...I hadn't experienced that before. (Interview 2, March 16, 2016).*



Science and Math Curricular Studies in field at ASCCA

In-School Seminars

- *I feel that reflection time was huge, and that is something that has really helped making those ties between theory and practice...I found we would naturally start talking about it, but I feel if it were prompted a bit, too, it also really helped, like bringing up some of the topics that we worked through, reflected on, and gave examples. I think that is one of the biggest things, having that time to make those connections when they don't occur to me or to one of my peers. Sometimes somebody else brought it up and it made a lot more sense because I had a very similar example that had occurred to me that also applied to that scenario, or hadn't occurred to me that I could use, that actually occurred to a kid, or they came up with something I hadn't thought of. (Interview 5, April 5, 2016)*

Considerations for Future Research

- Incorporating Indigenous Knowledges of Place
- Creating a Integrated **STEAM** Semester



Implications for Educational Programs

Structural Implications

- Organizational Models
- Sustainability
- Partnerships

Pedagogical Implications

- Evaluation
- Curriculum Integration
- Family/Community Involvement

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