### Culturally Responsive Pedagogy (CRP) for the Elementary School Mathematics Teacher

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### Introduction and Context for Study
- This Indigenous Mathematics Education (IndigMEC) conference poster presents an example of a study into culturally responsive mathematics teaching.
- The study explores the development and teaching of a new course for elementary teachers (pre-service and in-service) offered in the Faculty of Education at the University of Regina (SK, Canada).
- In response to rising challenges of teaching mathematics in diverse classrooms to diverse populations, the course in culturally responsive pedagogy (CRP) was constructed as part of a new 10-course certificate program in *Teaching Elementary School Mathematics* (TESM).

### Cultural Context for Study
- The study is embedded at the University of Regina whose 2015-2020 Strategic Plan highlights Indigenization as an overarching area of emphasis.
- In Saskatchewan, CRP might reflect local Indigenous peoples cultures from Nêhiyawak (Plains Cree), Nahkawininiwak (Saulteaux), Nakota (Assiniboine), Dakota and Lakota (Sioux), and Denesuline (Dene/Chipewyan).
- In Saskatchewan, there is a growing and diverse immigrant population as well.

### Focus and Purpose of Study
- Culturally diverse student populations demand attention to, and transformation of, conventional (often teacher-directed) pedagogy in mathematics; such pedagogy is often based on a belief that mathematics is culturally- and value-neutral.
- The purpose of the study described in this poster is to share student experiences of the new course in *Culturally Responsive Pedagogy* (CRP) in the mathematics classroom. This course in CRP challenges and disrupts universal views of teaching, learning, and knowing mathematics.

### Theoretical Framework of Study
- In this CRP course research study, the theory and practice of CRP in mathematics is connected to, and embedded within, overarching goals of deepening understanding of mathematics concepts and developing a critical cultural consciousness through explicit engagement with anti-racist, anti-oppressive, and decolonial perspectives (Nolan & Graham, 2016).
- Gay (2000) defines culturally responsive teaching as “using the cultural knowledge, prior experiences, frames of reference, and performance styles of ethnically diverse students to make learning encounters more relevant and effective for them” (p. 29). Gay lists characteristics of culturally responsive teaching: [see next slide]

### Theoretical Framework of Study (cont’d)
- Different ethnic groups’ cultural heritages as worthy content; Meaningful bridges between home & school, between academic & sociocultural; Instructional strategies should connect to different learning styles; Students get to know cultural heritages (own and others); Integration of multicultural resources across curriculum. (p. 29)
- Leonard (2008) proposes that culturally relevant teaching in mathematics classrooms has a two-part definition: (1) the recognition that mathematics has been present in every culture since societies have had recorded histories; and (2) the effect of mathematics on any culture and its people... (p. 42). According to Leonard, CRP supports the following three goals for students: (1) academic success; (2) cultural competence; and (3) the ability to critique the existing social order (p. 42)
Methods and Data of Study

- First offering of the course occurred in July 2017
- Data were collected on student perceptions through a pre-course survey and a reflective blog assignment as the course progressed. Students (participants) were asked what culturally responsive (CR) means, how CR might apply to the pedagogy (P) of math, as well as a critical exploration of views on what it means to develop ‘cultural consciousness’
- Data still being analysed and summarized according to themes emerging from the survey and reflective blog assignment questions. In this presentation, a small subset of data is shared.

Methods and Data of Study (cont’d)

- Pre-Course Survey Questions Q4, Q5, Q6 [not presented due to space limitations]
- The final (post-course) REFLECTIVE BLOG assignment question:

Prior to beginning this course journey (the pre-course survey), you were asked to define culturally responsive pedagogy (CRP) in general and, more specifically, CRP in the mathematics classroom. Considering your learning in this course through the readings, discussions, reflections, and assignments, reflect on 3 key areas of your own personal and/or professional growth with regard to CRP in the mathematics classroom.

Excerpts from Student Final REFLECTIVE BLOG Responses:

It’s hard to believe that just over one month ago, I sat down to fill out a survey for this class, and had no idea what culturally responsive pedagogy was or why I needed to know about it. Math is math, isn’t it? Then, on July 5, I wrote:

What has been seen cannot be unseen, and now the burden for change rests on my shoulders. What do I teach when I can see the bias in the curriculum but do not possess the knowledge or tools to emend the bias? I can’t avoid teaching the curriculum. If I should take the time to really explore the issue rather than finding a quick solution, what do I teach until I figure it out? Will I get it right before I retire? Will I mess up a generation of children along the way? The questions that haunted my sleep in my first years of teaching are popping up again.

What has changed since then? Not a whole lot, I’m afraid. Today, I feel I have a deeper understanding of the problems, many more questions, and a few ideas of what I can do in my classroom. But those few ideas give me hope. [student 1]

There are people who believe they use CRP, but they may be going about it in the wrong way. CRP is not something that is done without learning how to meet the needs of your students in an authentic and purposeful way. During the past three weeks I have grown in three areas; authentic integration of culture, understanding global and historical perspectives of mathematics, and Indigenous education… CRP is when you respond to the needs of your students by understanding their culture and looking outside the traditional understanding of what mathematics is, pushing the boundaries of the box, and challenging your own ways of learning to push your students. [student 2]

Other cultures and languages each have their way of knowing. Their language is the first part of their collective knowledge. Through their language they begin to make sense of their family, community and the outside world. They learn how to speak their language and recognize themselves with in their language. I have learned that honoring students’ first language must always be the first and foremost in the minds of educators…. [M]athematics is not just about higher level math experiences. CRP explores ways to validate community. It starts with language and includes aspects such as current or historical knowledge, home or school knowledge, land base knowledge. CRP helps make a community and its members whole. [student 3]