TSG Agenda

TSG _51___: ____ **Mathematics education for ethnic minorities_____**

Class: __A__ (Class A for TSGs with odd numbers; Class B for TSGs with even numbers)

**Please prioritize the sessions in "core-time" (from 19:30-23:00, Beijing time, i.e. Session 2, 3 for Class A and session 1, 2 for Class B) as they are friendly to most of the time zones in the world.

Session 1

Time: 14:30─14:34

Opening words by TSG team.

1. Time: 14:35─15:05

   Title of the Paper:

   HOW DOES A TEACHER SUSTAIN COLLECTIVE MATHEMATIZING AMONG NON-DOMINANT STUDENTS?

   Author(s) (with the presenter name in BOLD if more than 1 name here):

   John Griffith Tupouniua, Jodie Hunter

   Institution(s) (to school/department/research center) and Country/Region:

   Massey University, New Zealand

   Short abstract of the paper (20 lines maximum):

   In this paper, we describe a teacher's attempt to sustain collective mathematizing among non- dominant students in a classroom that emphasizes collective success. Taking a collectivist stance, we conceptualize the featured classroom as one in which the students function as a single learning organism. We analyze three roles that the teacher played within a lesson focused on students' engagement with repeating patterns. Specifically, we discuss the affordances of the three roles with respect to

sustaining three characteristics of a classroom that functions as a single learning organism.

2. Time: 15:06─15:25

   Title of the Paper:

   CHINESE ETHNIC MINORITIES STUDENTS PERFORMANCE IN MATHEMATICAL PROBLEM POSING

   Author(s) (with the presenter name in BOLD if more than 1 name here)

   Lianchun Dong, Wei He

   Institution(s) (to school/department/research center) and Country/Region

   Minzu University of China, China

   Short abstract of the paper (20 lines maximum):

   This study investigates Chinese ethnic minorities students performance in problem posing tasks. A set of mathematics problem posing tasks in three different situations (respectively free, semi-structured and structured situations) was developed to examine students performance in mathematics posing. 105 students in year 5 from Xinjiang Province, China participated in this study. This study found that the number of problems posed by Chinese ethnic minorities students in all three situations is fewer than those by Chinese Han students, but the complexity of the problems posed by Chinese ethnic minorities students in semi-structured and structured situations is not lower than their Chinese Han counterparts.

3. Time: 15:26─15:45

   Title of the Paper:

   STUDY ON INFLUENCING FACTORS OF MATH ACHIEVEMENTS OF ETHNIC MINORITY SENIOR HIGH SCHOOL STUDENTS IN MAINLAND CHINA

Author(s) (with the presenter name in BOLD if more than 1 name here)

Aoxue Su

Institution(s) (to school/department/research center) and Country/Region

College of Science, Minzu university of china, China

Short abstract of the paper (20 lines maximum):

The quality of minority education is related to the cultivation of talents in ethnic areas, the economic development of ethnic areas and the improvement of ethnic quality. Based on a questionnaire survey of 932 teachers and 1873 ethnic minority senior high studentsas well as a students' academic math testthe student and school factors that impact students' math achievement have been studies with the two levels HLM. The results showed that at the student individual levelboys' math achievement was significantly higher than girls; Students who expected to be enrolled in mixed classes had a significantly higher math achievement than those who expected to be enrolled in divided classes; SES had no significant influence on math achievement; students' learning strategies and learning self-efficacy had a significant positive impact on their math achievement and learning self-efficacy was the primary factor. At the school level, the teacher job satisfaction had significant positive effects on student math achievement, and school location meditated the relationship among the expected mode of class and academic performance.

4. Time: 15:46 ─15:55

Title of the Paper:

THE IMPLEMENTATION OF CULTURALLY RESPONSIVE TEACHING PRACTICES INTO THE MATHEMATICS COURSE

Author(s) (with the presenter name in BOLD if more than 1 name here)

Hsueh-Yun Yu, Huey-Lien Kao,Kuo-Hua Wang

Institution(s) (to school/department/research center) and Country/Region

National Changhua University of education, Taichung, Taiwan

Short abstract of the paper (20 lines maximum):

The purpose of this study was from motivating students to engage in Mathematics learning. Using action research, which included the subjects from secondary level in eight grade of Bunun folk. The researcher who designed relevant materials culturally responsive pedagogy of mathematics teaching. Adopted students learning by a series of mathematics question groups, reflections, interactions, interviews with students as well as the pre and post tests. Findings of this study were referent verification for teaching efficiency which also explored the transformations of students learning motivation and the efficiency of mathematics. Students viewpoints toward learning mathematics course had a better understanding after implementing culturally responsive teaching. The conclusions were followed: (a) Students learning motivation had become more positive after experiencing culturally responsive pedagogy of mathematics teaching. (b) Culturally responsive pedagogy of mathematics teaching enhanced students mathematics capabilities and scores efficiently.

5. Time: 15:56─16:30

Round of debate, with questions for the presenters and general reflections form the participants-

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Session 2

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1. Time: 19:30─20:00

Title of the Paper:

A Case Study on the Application of "Situational Problems" Teaching Model in the Mathematics Education of Ethnic Primary School Students

Author(s) (with the presenter name in BOLD if more than 1 name here):

Chang-Jun Zhou

Institution(s) (to school/department/research center) and Country/Region:

Dehong teachers college, Mangshi, China

Short abstract of the paper (20 lines maximum):

In this study, 12 primary schools in longchuan County, dehong state, were selected to explore the effects and existing problems of the teaching mode of mathematics "situational problems" in the cross-border ethnic areas of Southwest China. The three-year study from 2014 to 2016 shows that teachers who are culturally sensitive and good at using modern educational methods can use this model to help ethnic students study mathematics and achieve better results. To apply this teaching model in ethnic minority areas, the goal of this teaching model can be fully reflected only if we pay attention to the cultivation of the cultural sensitivity quality of the teachers before and after work and enhance their ability to use modern education techniques.

2. Time: 20:01—20:20

Title of the Paper:

INVESTIGATION ON TEACHER PROFESSIONAL DEVELOPMENT IN MINORITY AREAS: TAKING YAO AUTONOMOUS COUNTY OF LIANNAN, QINGYUAN AS AN EXAMPLE

Author(s) (with the presenter name in BOLD if more than 1 name here)

Mudan Chen, Ida A.C. Mok

Institution(s) (to school/department/research center) and Country/Region

Faculty of Education, The University of Hong Kong, HK

Short abstract of the paper (20 lines maximum):

Quality Education in minority areas has been paid much attention in education research. The quality of teachers has been regarded as the key guarantee of quality education. Taking the Yao Autonomous County of Liannan, Qingyuan in Guangdong Province as an example, this study focuses on the professional development of mathematics teachers in minority areas from the perspective of

Mathematics Pedagogical Content Knowledge (MPCK). By employing the questionnaire survey and in-depth interview, it investigates the current status, studies the degree of contribution of different sources to the development of three dimensions of MPCK, and explores whether characteristic variables have a significant impact on the MPCK development. Hearing the voices of teachers in different contexts and putting forwards schemes for related departments are efficient patterns for accelerating the teacher education development. Although the investigation is only taken place in the certain minority area, education researchers and policy makers can also draw inspiration from it.

3. Time: 20:21—20:30

Title of the Paper:

Renegotiating Recruitment and Retention Efforts: Promoting Teacher Diversity in Mathematics and Science Classrooms

Author(s) (with the presenter name in BOLD if more than 1 name here)

Christine Darling Thomas, Natalie Simone King

Institution(s) (to school/department/research center) and Country/Region

Georgia State University, (Atlanta, GA), USA

Short abstract of the paper (20 lines maximum):

In this presentation, we share evidence-based strategies on how to recruit and retain diverse mathematics and science teachers. Research suggests that many teachers often underestimate the potential of students of color to excel in the STEM disciplines (Brickhouse, Lowery, & Schultz, 2000). These negative perceptions have a tendency to discourage students from realizing their true potentials and perceiving themselves as STEM talent. Although researchers have analyzed various challenges and strategies to decrease the impact of resisting factors, increasing teachers capacity to create equitable mathematics and science learning spaces within urban settings continues to remain a challenge (Fraser-Abder, Atwater, and Lee, 2006; Kokka, 2016). These realities reify the need to explore innovative ways to prepare and develop culturally competent STEM teachers who can thrive even in the most challenging working conditions. We provide potential approaches and solutions so that the relatively homogeneous and static demographic of the teaching workforce (particularly in

mathematics and science) can begin to adequately reflect the dynamism and racial and ethnic diversity of U.S. students.

4. Time: 20:31—21:00

Round of debate, with questions for the presenters and general reflections

Session 3

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1. Time: 21:30 —22:00

Title of the Paper:

RETHINKING ETHNOGRAPHY IN MATHEMATICS EDUCATION OF ETHNIC MINORITIES

Author(s) (with the presenter name in BOLD if more than 1 name here):

Carolina Tamayo, Aldo Parra

Institution(s) (to school/department/research center) and Country/Region:

Universidade Federal de Minas Gerais/Brazil.
Mathematics Department, Universidad del Cauca/Colombia.

Short abstract of the paper (20 lines maximum):

This text aims to problematize ethnography in research conducted on ethnic minorities, by provoking a movement of deconstruction of the certainties caused by the uses of this method, tracing lines of escape to understand that ethnography carries with it a series of assumptions that create limitations of political and epistemological nature for mathematics education research, and some of those limitations end up undermining the possibility of reaching a new understanding of mathematics as a sociocultural practice.

2. Time: 22:01—22:20

Title of the Paper:

INVESTIGATION AND RESEARCH ON MATHEMATICAL CULTURE ACCOMPLISHMENT OF PRIMARY SCHOOL MATHEMATICS TEACHERS IN ETHNIC MINORITY AREAS

Author(s) (with the presenter name in BOLD if more than 1 name here)

Jun Wu, Jing Ting

Institution(s) (to school/department/research center) and Country/Region

Yunnan Normal University, Kunming, China

Short abstract of the paper (20 lines maximum):

The accomplishment of teachers in ethnic minority areas is the key to the reform of national education. The promotion of mathematics culture accomplishment is of great significance to the promotion of the professional development of primary school mathematics teachers. Based on the questionnaire and interview survey of 760 primary school mathematics teachers in ethnic minority areas of Yunnan, this research shows that, the mathematics culture accomplishment of primary school mathematics teachers in ethnic minority areas are generally at a medium level, there are significant differences in ethnicity, gender, urban and rural areas. Therefore, it is necessary to set up a "primary school mathematics culture" course; establish a primary school mathematics culture teacher community; and integrate the national mathematics culture into primary school mathematics teaching.

3. Time: 22:21—22:30

Title of the Paper:

PREPARING THE NEXT GENERATION OF STEM INNOVATORS

Author(s) (with the presenter name in BOLD if more than 1 name here)

Daniela Cabrera, Jose David Fonseca, Gerardo Lopez

Institution(s) (to school/department/research center) and Country/Region

University of Arizona, USA

Short abstract of the paper (20 lines maximum):

This project addresses issues of social justice, and the environment in the educational pipeline, by incorporating environmental science, math, and cultural elements into hands-on project-based learning activities for 6-12 students in predominantly American Indian and Hispanic communities. Professional development (PD) workshops for the development of a culturally relevant STEM greenhouse project-based learning curriculum was provided for teachers.

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4. Time: 22:30─23:00

Round of debate, with questions for the presenters and final reflections

Note:

Class A:

- Session 1: 14:30-16:30 Beijing time, July 13th
- Session 2: 19:30-21:00 Beijing time, July 14th
- Session 3: 21:30-23:00 Beijing time, July 17th

Class B:

- Session 1: 19:30-21:00 Beijing time, July 13th
- Session 2: 21:30-23:00 Beijing time, July 16th
- Session 3: 14:30-16:30 Beijing time, July 17th