

TSG Agenda

TSG 33: Knowledge in/for teaching mathematics at secondary level

Class: A

****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

1. Time: 14:30—14:50

Introduction to TSG 33 by the TSG organizing team

The team will introduce to the main topics of the TSG

2. Time: 14:50—15:10

Title of the Paper: CRITICAL REMARKS ON THE NOTION OF UNPACKING MATHEMATICS IN DISCOURSES OF TEACHER KNOWLEDGE

Author(s): Thorsten SCHEINER

Institute for Learning Sciences & Teacher Education, Australian Catholic University, Australia

This presentation examines the notion of unpacking mathematics prevalent in discourses of mathematics teacher knowledge. First, a relatively deep account of the notion of unpacking mathematics is given, and its resemblance to the French tradition of transposition didactique and the German tradition of Stoffdidaktik is outlined. Then, the presentation problematizes the notion of unpacking mathematics around three broad issues: (1) the conceptualization of mathematics as a static object; (2) the individual as the locus of teaching and learning; and (3) the power imbalance in the teaching–learning context. Lastly, implications of the problematization of these issues for conceptualizing teacher work and teacher knowledge are discussed.

3. Time: 15:10—15:30

Title of the Paper: WHAT SUBJECT MATTER KNOWLEDGE DO CHINESE IN-SERVICE JUNIOR MIDDLE SCHOOL TEACHERS LACK?

Author(s): Dandan SUN

School of Mathematical Sciences, East China Normal University, China

This study aims to identify what subjective matter knowledge Chinese in-service junior middle school teachers lack. 82 Chinese in-service junior middle school teachers were asked to formulate three questions about the mathematics that they find most confusing. The teachers' questions are coded deductively according to the framework of mathematical knowledge for teaching (MKT), more specifically, subjective matter knowledge (SMK). The result shows that teachers mostly lack specialized content knowledge (SCK). To gain further insight on which SCK the teachers are lacking, some of the questions are coded inductively. Based on the data, SCK can be divided into 6 subcategories: origin of knowledge; understanding of concepts; the rationality of rules; principle of procedure; proof of propositions, structure of the subject, the first two of which need to be paid more attention.

4. Time: 15:30—15:40

Title of the Paper: ASSESSING THE RELATIONSHIP BETWEEN TEACHERS' KNOWLEDGE AND CLASSROOM PRACTICES IN THE USE OF ICT IN THE SECONDARY MATHEMATICS CLASSROOM

Author(s): Mailizar MAILIZAR

Universitas Syiah Kuala, Banda Aceh, Indonesia

This study aimed to examine the relationship between teachers' knowledge and their classroom practices in the use of ICT in the secondary mathematics classroom. It employed an explanatory mixed-method whereby both quantitative and qualitative approaches for data collection were undertaken sequentially. The study was conducted in Indonesia in which 341 upper secondary mathematics teachers participated in the quantitative phase, and ten of them got involved in the qualitative phase. The findings reveal a significantly positive correlation between teachers' knowledge and their classroom practices in ICT use. In further detail, the findings show that the correlation between teachers' knowledge of ICT use in teaching and their classroom practices is stronger than the correlation between teachers' knowledge of ICT and their classroom practices. It is suggested that teachers'

knowledge of ICT use in teaching plays a more significant role than teachers' knowledge of ICT in the integrating of ICT in the classroom.

5. Time: 15:40—15:50

Title of the Paper: NUMBER SENSE OF TEACHERS IN DIFFERENT SCHOOL LEVELS

Author(s): Rahmah JOHAR, Munirah Ghazali, Mailizar & Suci Maulina
Universitas Syiah Kuala & Universiti Sains, Malaysia

Number sense is essential in mathematics but, it has not received much attention. A number of studies reported Indonesian students' number sense ability remains insufficient. On the other hand, research on Indonesian teachers' number sense is still limited. This study aims to investigate Indonesian primary and secondary teachers' number sense and describe their number sense strategies. A test, consisting of five questions adapted from Alsawaie (2012) was administered to 33 primary school teachers (PSTs), 25 junior high school teachers (JHSTs) and 39 senior high school teachers (SHSTs) for at most 15 minutes. Their answers were analyzed descriptively. The findings showed that the PSTs' number sense is lower than the JHSTs' and SHSTs'. However, the percentages of JHSTs and SHSTs who possessed good number sense were also relatively small. One implication from this study is the need to improve mathematics curriculum for primary and secondary schoolteachers.

6. Time: 15:50—16:00

Title of the Paper: ARTS INTEGRATED PEDAGOGY FOR MEANINGFUL MATHEMATICS TEACHING AND LEARNING

Author(s): Binod Prasad PANT, Bal Chandra Luitel & Indra Mani Shrestha
Kathmandu University, Nepal

In Nepal, teaching Mathematics has been guided by the notion of transferring knowledge and skills from teachers to students. The overemphasis on "rule-centric" approach of mathematics teaching and the focus on pre-defined algorithms as the ultimate way of solving mathematical problems since the yearly years of schooling have been creating problems in school level mathematics. In this context, the authors argue that students should learn the real-world mathematical problems through the various artistic ways of knowing. The arts integrated pedagogy is an innovative pedagogical approach which offers better alternative as an integrated and interdisciplinary approach to learning that encourages

students to think more broadly and critically about the real-world problems. The paper, as a part of ongoing PhD study of the first author, focuses on the needs and usefulness of arts integrated pedagogy in Nepali context to make mathematics teaching more meaningful for producing creative and critical citizens. This paper is useful for mathematics teachers, teacher educators and researchers who argue on arts integration in mathematics teaching.

7. Time: 16:00–16:10

Title of the Paper: UNCOVERING MATHEMATICS TEACHING KNOWLEDGE OF OUT-OF-FIELD MATHEMATICS TEACHERS

Author(s): Achmad NIZAR, Merrilyn Goos, Niamh O’Meara & Ciara Lane

University of Limerick, Ireland

Recently, the phenomenon of out-of-field (OOF) mathematics teachers has been highlighted worldwide. Some studies show that several countries such as Ireland, Indonesia, Australia, United States, England, South Africa, Korea, Germany, or Israel tend to assign OOF teachers rather than qualified mathematics teachers in implementing their mathematics lessons. This article aims to expose the phenomenon of OOF teachers of mathematics based on findings from TIMSS 2015, PISA 2012, and TEDS-M 2008 while also highlighting challenges and strategies in uncovering the mathematics teaching knowledge among OOF teachers of mathematics.

8. Time: 16:10–16:20

Title of the Paper: A STUDY OF SRI LANKA’S PRE-SERVICE MATHEMATICS TEACHERS’ PEDAGOGICAL CONTENT KNOWLEDGE

Author(s): G.M. WADANAMBI & Frederick K.S. Leung

Nilwala National College of Education; Sri Lanka & The University of Hong Kong

The purpose of this study is to investigate the pedagogical content knowledge (PCK) of pre-service mathematics teachers in Sri Lanka. A questionnaire consisting of PCK items was employed to collect data from a cohort of pre-service mathematics teachers enrolled in a three-year pre-service teacher education program at National Colleges of Education (NCoEs) in Sri Lanka. The results suggest that the participants need more learning opportunities to improve their PCK regarding both knowledge of teaching (KOT) and knowledge of students thinking (KOS).

9. Time: 16:20–16:30

Time for Discussion by the TSG organizing team

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Session 2

1. Time: 19:30–19:40

Introduction to session 2 TSG 33 by the TSG organizing team

2. Time: 19:40–20:00

Title of the Paper: INTERWEAVING MATHEMATICS-NEWS-SNAPSHOTS IN CLASS: IMPLICATIONS FOR TEACHERS' HORIZON CONTENT KNOWLEDGE

Author(s): Ruti SEGAL, Atara Shriki, Boaz Silverman, Nitsa Movshovitz-Hadar Oranim
Academic College of Education, Kibbutzim College of Education, Technion –I.I.T, Israel

In this paper, we bring results from a longitudinal study that examined the development of teachers' Mathematical Knowledge for Teaching (MKT) after interweaving mathematical news from contemporary mathematics in their teaching. In particular, we focus on: mathematical Horizon Content Knowledge (HCK), Specialized Content Knowledge (SCK), and Knowledge of Content and Students (KCS). Six high-school teachers were provided with a series of ready-to-deliver Mathematics-News-Snapshots. They exposed them once a month over three years of high school to the same group of students (grades 10-12). Our findings indicate that teachers' involvement in the project gradually developed their SCK, KCS and HCK. The findings related to the development of their HCK, indicate that there are two types of HCK: (i) personal HCK held by an individual math teacher; (ii) enacted HCK, on which teachers draw when planning or teaching lessons. These two types intertwine and nurture each other.

3. Time: 20:00–20:20

Title of the Paper: COMPARING GERMAN AND SLOVAK TEACHERS' KNOWLEDGE OF CONTENT AND STUDENTS RELATED TO FUNCTIONS

Author(s): Veronika HUBEŇÁKOVÁ, Ute Sproesser & Ingrid Semanišínová

Pavol Jozef Safarik University in Košice, Ludwigsburg University of Education

A crucial aspect of learning about (linear) functions is being able to change between graph and equation. Common German and Slovak textbooks propose different procedures for these representational changes. Within a sample of 49 German and 56 Slovak teachers, we analyzed if these different procedures can also be observed in the teachers' corresponding knowledge of content and students, i. e. if the teachers expected different student strategies and errors. The results confirm this assumption and emphasize the importance to consider this teacher's knowledge in a country-specific way and to be careful when comparing such knowledge of teachers from different countries.

4. Time: 20:20—20:30

Title of the Paper: A FOCUS ON THE SPECIFICITIES OF TEACHERS' KNOWLEDGE FOR IMPROVING TEACHER EDUCATION: THE CASE OF THE MTSK CONCEPTUALIZATION

Author(s): Miguel RIBEIRO, Marlova Caldatto, & Milena Policastro

State University of Campinas – UNICAMP, Brazil; Federal Technological University of Paraná – UTFPR, Brazil

Teachers' knowledge impacts teachers' practices, and consequently, the improvement of students' learnings and results. It's thus, crucial to discuss deeper understand the content of such knowledge and how it is understood and the foci of its development in different contexts in order to enrich the proposals for teacher education. This paper discusses some potentialities (and constrains) of using the Mathematics Teacher's Specialised Knowledge (MTSK) conceptualization in and for analyzing two mathematics teacher education contexts – initial and continuous – with two different approaches – documental analysis and case study. Results reveal the MTSK as a powerful methodological tool for characterizing teachers' knowledge even in contexts designed within other backgrounds.

5. Time: 20:30—20:40

Title of the Paper: THE INFLUENCE OF TEACHING EXPERIENCE ON MATHEMATICAL TEACHER CONTENT KNOWLEDGE AT MIDDLE SCHOOL LEVEL

Author(s): Maria D. CRUZ QUIÑONES, Mourat Tchoshanov, Héctor Jesús Portillo Lara, Carlos Paez & Rocío Gallardo

Universidad Autónoma de Cd. Juárez, University of Texas at El Paso, Navajo Technical University

The intent of this study was to examine the mathematical teacher content knowledge of Mexican teachers. Teachers (n=64) from 7-9 grades in Mexico were tested using the teacher content knowledge survey. This survey measures the three cognitive types of teacher content knowledge. Cognitive type 1 is the knowledge of facts and procedures. Cognitive type 2 refers to the knowledge of concepts and connections. The cognitive type 3 is the knowledge of model and generalizations. An examination of each cognitive type of content knowledge and the overall TCKS score as they related to years of teaching experience is presented. Findings show that teaching experience is strongly correlated with the mathematical teacher content knowledge concerned to the knowledge of facts and procedures

6. Time: 20:40—20:50

Title of the Paper: IMPLEMENTATION OF EIGHT TEACHING PRACTICES FOR TEACHING PROBLEM SOLVING

Author(s): Sarah SPARKS, Alees Lee, Katie Morrison, Gulden Karakok

University of Northern Colorado

The purpose of this paper is to describe an implementation of the eight mathematics teaching practices outlined in the Principles to Actions in a weeklong Math Teachers' Circle summer workshop, a problem-solving focused professional development model for middle school teachers. Participants worked on solving challenging mathematics problems and discussed different solution strategies as well as shared what they noticed from the eight teaching practices as learners during problem-solving sessions. The subsequent sessions focused on having participants make connections to their teaching of problem solving through task designing and lesson planning activities. Our qualitative research study explored the ways in which emphasizing the eight teaching practices during daily problem-solving sessions assisted participants' transition from engaging with mathematics as learners to planning problem solving lessons as teachers. One group of participants' tasks and lesson plans analysis indicated a need to unpack the meaning of productive struggle in teaching of problem solving.

7. Time: 20:50—21:00

Title of the Paper: TEACHER'S MATHEMATICAL KNOWLEDGE IN SOLVING A SYSTEM OF LINEAR EQUATIONS. A CASE STUDY

Author(s): David Alfonso PÁEZ, Cesar Martínez Hernández, Daniel Eudave Muñoz & Teresa de J. Cañedo Ortiz

CONACyT, Universidad de Colima, & Universidad Autónoma de Aguascalientes

The aim of this paper is to show the mathematical knowledge that a teacher reveals when solving systems of linear equations in two variables. We report a case study of a Mexican teacher, teaching mathematics even when his professional profile is not related. Two class sessions were videotaped in order to promote a reflection on his teaching practice. Results show this teacher has basic knowledge related to finding the values that satisfy a system of linear equations, which may produce conceptual and epistemological obstacles to students; results also show that he lacks mathematical arguments to determine and justify if a system of linear equations can be solved.

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Session 3 (717B)

1. Time: 14:30—14:40

Introduction to session 3 TSG 33 by the TSG organizing team

2. Time: 14:40—15:00

Title of the Paper: A PRESERVICE SECONDARY MATHEMATICS TEACHER'S SPECIALIZED KNOWLEDGE: THE CASE OF LIMIT

Author(s): RÜYA SAVURAN & MINE IŞIKSAL-BOSTAN

Middle East Technical University; Turkey

This study examines the mathematical knowledge of preservice secondary teachers from the perspective of Mathematical Teachers' Specialized Knowledge (MTSK) regarding the concept of limits. For this aim, it was focused on knowledge of topics including the dimensions of properties and its foundations, phenomenology and application, mathematical procedures and representation systems. The research method was a single

case study and the data collection tool was a task-based interview prepared by the researcher considering the literature. The study contributes to the development of the subdomain of MTSK model for the mathematics education research in terms of its practicality.

3. Time: 15:00—15:20

Title of the Paper: WHAT DO TEACHERS LEARN ABOUT WHAT MATHEMATICS IS IN ACADEMIC MATHEMATICS COURSES?

Author(s): Anna HOFFMANN & Ruhama Even

Weizmann Institute of Science, Israel

This study investigates the contribution of academic mathematics courses to teacher learning about the discipline of mathematics. Analysis of interviews with 11 secondary school mathematics teachers, who graduated from a master's program that included a strong emphasis on academic mathematics studies, identified references of contribution to seven topics that can be grouped into three aspects of knowledge about the discipline of mathematics: (1) essence, (2) doing, and (3) worth. Two additional topics related to knowledge about the discipline of mathematics were mentioned by the teachers, but not with reference to contribution of their academic studies. Each of the three aspects was addressed by all or almost all the teachers. However, the number of teachers that addressed each topic varied considerably among and within aspects.

4. Time: 15:20—15:40

Title of the Paper: HIGH-SCHOOL MATHEMATICS TEACHER'S HORIZON CONTENT KNOWLEDGE: A CASE STUDY

Author(s): Yi-An CHO

National Hsin Chu Senior Industrial Vocational School, Taiwan

This study combines qualitative case study data with task analysis to explore an experienced high-school mathematics teachers' horizon content knowledge (HCK). Using systematic classroom observations and the follow-up interviews, this research explores teachers' HCK that exemplify a kind of elementary perspective on advanced knowledge, which complements to a higher perspective on elementary mathematics. Furthermore, HCK could be seen as a reciprocal pathway between the advanced mathematical knowledge and elementary mathematical perspectives.

5. Time: 15:40—15:50

Title of the Paper: MATHEMATICAL QUALITY OF GEOMETRY INSTRUCTION OF A NOVICE HIGH SCHOOL TEACHER IN TERMS OF RICHNESS OF MATHEMATICS

Author(s): Fatma ASLAN-TUTAK & Buket Semercioglu Kapcak
Bogazici University, Turkey

The aim of this study is to examine the quality of geometry instruction of a novice high school mathematics teacher in terms of richness of mathematics and the factors that affect her instruction. The quality of the geometry instruction of a participant who is first year mathematics teacher is aimed to be examined.

6. Time: 15:50—16:00

Title of the Paper: INVESTIGATION OF PRESERVICE MATHEMATICS TEACHERS' TRANSLATIONS AMONG MULTIPLE REPRESENTATIONS

Author(s): Zeynep PEHLIVAN & Fatma Aslan-Tutak Achmad
Bogazici University & Bogazici University

Algebraic thinking is a cohesive thread of exploring mathematical relationships, formulating generalizations and reasoning and connecting of multiple representations. This article strongly emphasized preservice high school teachers' patterns of behavior that elicits algebraic thinking while translation process is required between graphical representation and model representation. For this purpose, explanatory research design was implemented. Semi-structured and video-recorded interviews with two preservice teachers who recruited according to their relatively different positions in the study constituted the main data sources of this study. The findings demonstrated participating preservice high school mathematics teachers' relatively weak conceptual understanding on the concept of functions and difficulties with coordinating and interpreting dependent and independent variables. These results may indicate importance of addressing translations among multiple representations in functions during preservice teacher education.

7. Time: 16:00—16:10

Title of the Paper: PRESERVICE SECONDARY SCHOOL TEACHER’S ERRORS WHEN TRANSLATING BETWEEN REPRESENTATIONS

Author(s): Florence Thomo MAMBA

Mathematics and Statistics Department, University of Malawi-Polytechnic

This qualitative study investigated a preservice secondary school teacher’s misconceptions when translating between representations. Data were generated using an open ended paper and pencil test and interviews. I analysed the data using thematic analysis. Results indicate the preservice teacher formulated an inequality instead of equation when translating a word problem and formulated expressions instead of equations from a graph. These results suggest that errors might be transitional from teachers to their students unless the Mathematics teacher educator intervenes pedagogically.

8. Time: 16:10—16:20

Title of the Paper: INFLUENCE OF EVERYDAY EXPERIENCE ON PRE-SERVICE TEACHERS SUBJECT MATTER KNOWLEDGE OF FUNCTIONS

Author(s): Mirosława SAJKA

Pedagogical University of Cracow, Institute of Mathematics

Every human being experiences movement. The analysis and description of movement is a subject of mathematics and physics education, therefore it is crucial also in the context of mathematics teachers’ subject matter knowledge. The paper shows however, that in the light of preliminary research with the use of eyetracking methodology, pre-service mathematics teachers’ elementary skills in this matter are insufficient. One of the reasons for this is the influence of everyday experience where the graph of a function is unconsciously confused with a movement trajectory. The conclusion can be drawn that there is a need to provide a specially designed training for pre-service mathematics teachers to overcome such obstacles and work on developing teachers’ discipline of thinking.

9. Time: 16:20—16:30

Time for Discussion by the TSG organizing team

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Session 4 (717A)

1. Time: 21:30

Short welcome to session 4 TSG 33 by the TSG organizing team

2. Time: 21:30—21:50

Title of the Paper: CONNECTING KNOWLEDGE FOR TEACHING GEOMETRY AT THE SECONDARY LEVEL WITH INSTRUCTIONAL QUALITY IN MATHEMATICS TEACHING

Author(s): Agida G. MANIZADE & Dragana Martinovic

Radford University, USA, University of Windsor, Canada

In this study, we explore connections between theoretical knowledge for teaching mathematics at the secondary level, measured by a content-specific, short interactive (with virtual manipulatives), on-line scenario-based instrument, and teaching practice, as well as instructional quality in mathematics teaching. Since 1987, when Medley described relationships between variables within the presage-process-product and when Shulman conceptualized pedagogical content knowledge (PCK), different researchers have expanded on these works and developed their own conceptual and theoretical frameworks when describing the constructs and the connections between different types of teacher knowledge, teaching practice, evidence of instructional quality, and student outcomes. The methodology of this study included a concurrent mixed-methods approach, in which quantitative and qualitative phases of data collection were intermixed to explore research questions related to identifying the connections. The discussion of theoretical and methodological challenges related to design and analysis, as well as development of domain and instrumentation, will be presented here.

3. Time: 21:50—22:10

Title of the Paper: UPGRADING LEARNING FOR TEACHERS IN REAL ANALYSIS (ULTRA): AN INSTRUCTIONAL MODEL FOR SECONDARY TEACHER EDUCATION

Author(s): Nicholas H. WASSERMAN, Keith Weber, Juan Pablo, Mejia-Ramos & Timothy Fukawa-Connelly

Columbia University & Rutgers University, USA

In this paper, we explore the mathematical preparation of secondary teachers. In particular, we describe an instructional model – ‘building up from and stepping down to teaching practice’ – that we developed and has been used in advanced mathematics courses, such as real analysis. We elaborate on how the instructional model was developed in relation to theories of teacher knowledge and teacher education, as well as how the instructional model accounted for developing teacher classroom practices through ‘pedagogical mathematical practices’. Findings suggest the instructional model was promising for developing mathematical and pedagogical course objectives.

4. Time: 22:10–22:30

Title of the Paper: APPLICATIONS OF TEACHING SECONDARY MATHEMATICS IN UNDERGRADUATE MATHEMATICS COURSES

Author(s): Elizabeth G. ARNOLD, Elizabeth A. Burroughs, Elizabeth W. Fulton, James A. Mendoza Álvarez

James Madison University, Montana State University & University of Texas at Arlington, USA

Robust preparation of future secondary mathematics teachers requires attention to the acquisition of mathematical knowledge for teaching. Many future teachers learn mathematics content primarily through mathematics major courses that are taught by mathematicians who do not specialize in teacher preparation. How can mathematics education researchers assist mathematicians in making explicit connections between the content of undergraduate mathematics courses and the content of secondary mathematics? We present an articulation of five types of connections that can be used in secondary mathematics teacher preparation and give examples of question prompts that mathematicians can use as applications of teaching secondary mathematics in undergraduate mathematics courses.

5. Time: 22:30–22:40

Title of the Paper: MATHEMATICS TEACHERS’ PERCEPTIONS OF TEACHING COMPETENCIES: A STUDY OF GRADES 5 THROUGH 8

Author(s): Heather BLEECKER & Polly Dupuis

Salish Kootenai College

Research is limited in studies that compare general pedagogical knowledge (GPK) and mathematical pedagogical content knowledge (MPCK). This research study investigates mathematics teachers' perceptions of teaching competencies including GPK and MPCK. The aim of this study was to provide current and future mathematics teachers of grades 5 through 8 and their evaluators with a summary of how the importance of pedagogical knowledge can inform mathematics teacher practice, evaluation, and professional development. Data was collected by surveying practicing mathematics teachers. Respondents perceived GPK as more important than MPCK regardless of their teacher characteristics.

6. Time: 22:40—22:50

Title of the Paper: IDENTIFYING MATHEMATICAL LEARNING OPPORTUNITIES IN A TASK AS A MISSING, ESSENTIAL SKILL OF TEACHING

Author(s): Jodie D. Novak, Robert A. Powers, Alees T. Lee, Michelle (Morgan) KING, Adam Ruff & Shweta Naik

University of Northern Colorado & Western Colorado University, USA

This research examined a potential connection between teachers' mathematical knowledge for teaching [MKT] and what they attend to when reviewing novel mathematics tasks, particularly when asked to identify the potential mathematical learning opportunities in a task. Since the opportunities directly influence the type and quality of learning that take place in the classroom, a teachers' capacity to identify learning opportunities is an essential skill for effective mathematics teachers. The results suggest experienced teachers do not explicitly attend to learning opportunities in their review.

7. Time: 22:50—23:00

Closing Discussion by the TSG organizing team

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Posters

1. Poster presentation

Title of the Poster: THE VALIDATION OF AN ASSESSMENT INSTRUMENT FOR MEASURING MATHEMATICAL KNOWLEDGE FOR TEACHING (MKT)

Author(s): Mihyun Jeon

Indiana University, USA

This study aims to assess validity and reliability of assessment instrument that was designed to measure Mathematical Knowledge for Teaching ([MKT], Ball, Thames, & Phelps, 2008) by Jeon & Kim (2015). Through statistical test, this study compares the findings of this study with those of Jeon & Kim (2015)'s study; and discusses whether the instrument can be developed in an extended content area and context by replicating the instrument development process

2. Poster presentation

Title of the Poster: THE SPECIALIZED KNOWLEDGE OF A NEW GENERATION OF MATHEMATICS TEACHERS UNDER STEM TRAINING

Author(s): Jenny Patricia Acevedo-Rincón

Universidad del Norte, Colombia

This paper aims to analyse the results from a case study made up of a new generation of future mathematics teachers participating in STEM experiences. Four students analyse resolution practices in everyday situations under a STEM approach to provide a broad understanding of the practices and knowledge of the group of future teachers who teach mathematics. Finally, the future teachers reflect the complexities of the processes and overlapping moments in the planning, implementation, and discussion of the mathematics lessons under a STEM model.

3. Poster presentation

Title of the Poster: A CASE STUDY ON MPCK OF JUNIOR MIDDLE SCHOOL MATHEMATICS TEACHERS WITH DIFFERENT CHARACTERISTICS

Author(s): Ruifang Zhao , Meiyue Jin, Chang Li

Liaoning Normal University, China

Through the method of questionnaire survey, in-depth interview and case study, this paper takes six junior middle school mathematics teachers with different characteristics as the research object for case analysis. The results show that the MPCK of math teachers in "Level 1" is at the lowest level of "understanding". In order to improve the MPCK of mathematics teachers, three suggestions are proposed: Teachers should pay attention to the integration of mathematics knowledge and pedagogy knowledge; Combine mathematics curriculum standard with the mathematics textbook to profound interpretation teaching content.