

ICME13

Hamburg 2016

13th International Congress on
Mathematical Education (ICME-13)
24 – 31 July 2016 in Hamburg



Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

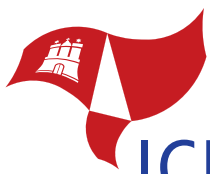
Final Programme





Content

	Welcome to ICME-13	5
	Committees of ICME-13	6
	Congress Information / Overview	7
	General Information	8
	Opening and Closing Ceremony	14
	Lectures of the ICMI awardees	15
	Plenary Activities	16
	Invited Lectures	20
	ICMI Studies and Survey Teams	26
	ICMI Affiliate Organisations	30
	National Presentations	34
	Thematic Afternoon	36
	Topic Study Groups	44
	Oral Communications	146
	Poster	258
	Discussion Groups	308
	Workshops	326
	Mathematical Exhibition	344
	Early Career Researcher Day	345
	Teachers' Activities	348
	For your notes	350
	Sponsors and Supporters	355



ICME13

Hamburg 2016

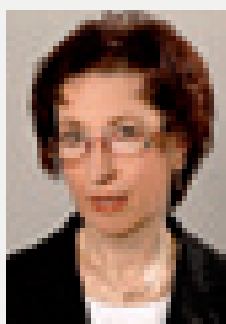


Welcome to ICME-13

The Society of Didactics of Mathematics (Gesellschaft für Didaktik der Mathematik – GDM) has the pleasure of hosting ICME-13 in 2016 in Germany. The congress – to be held under the auspices of the International Commission on Mathematical Instruction (ICMI) – takes place at the University of Hamburg from Sunday, 24th July to Sunday, 31st July 2016. Hamburg is a bustling cosmopolitan port in the north of Germany, and with 1.8 million inhabitants its second largest city. It offers a perfect environment for a challenging congress.

We invite participants from all over the world to come to Hamburg and make ICME-13 a rich experience for all. ICME-3 took place in Germany in 1976 in Karlsruhe, and we are proud to welcome mathematics educators from all over the world back to Germany. The congress attendees will experience the very special characteristics of the German mathematics education discussion, which is closely connected to European traditions of didactics of mathematics and has seen important recent developments.

The Society of Didactics of Mathematics represents the German speaking community of didactics of mathematics, bringing together mathematics education groups from Germany, Austria and Switzerland. Supported by the German Mathematical Society, the German Educational Research Association and the German Association for the Advancement of Mathematics and Science Education we are eager to welcome ICME-13 participants to Germany. The congress is hosted by the University of Hamburg supporting ICME-13 strongly since the very beginning. The University of Hamburg deserves our special thanks.

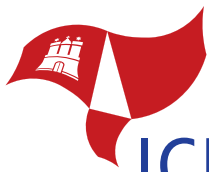


Gabriele Kaiser
University of Hamburg
Convenor of ICME-13



Rudolf vom Hofe
President of the Society of
Didactics of Mathematics





COMMITTEES OF ICME-13

International Programme Committee (IPC)

Gabriele Kaiser (Germany) – Chair of IPC and Convenor ICME-13
Abraham Arcavi (Israel) – Secretary General of ICMI
Ferdinando Arzarello (Italy) – President of ICMI
Kiril Bankov (Bulgaria)
Rute Borba (Brazil)
George Ekol (Uganda)
Helen Forgasz (Australia)
Mellony Graven (South Africa)
Alain Kuzniak (France)
Hee-Chan Lew (Korea)
Johnny Lott (USA)
Marianne Nolte (Germany) – Chair of Local Organising Committee ICME-13
Jarmila Novotna (Czech Republic)
Birgit Pepin (The Netherlands)
Susanne Prediger (Germany)
Elaine Simmt (Canada)
John Toland (Great Britain) – Representative of IMU
Kalifa Traoré (Burkina Faso)
Behiye Ubuz (Turkey)
Monica Ester Villarreal (Argentina)
Binyan Xu (China)
Senior Advisor: Mogens Niss (Denmark)

Local Organising Committee (LOC)

Convenor: Gabriele Kaiser (University of Hamburg)
Chair of the LOC: Marianne Nolte (University of Hamburg)
Angelika Bikner-Ahsbahs (University of Bremen)
Dagmar Bönig (University of Bremen)
Nils Buchholtz (University of Hamburg)
Aiso Heinze (IPN at CAU University Kiel)
Christine Knipping (University of Bremen)
Ulrich Kortenkamp (University of Potsdam)
Günter Krauthausen (University of Hamburg)
Dominik Leiß (Leuphana University Lüneburg)
Anke Lindmeier (IPN at CAU University Kiel)
Michael Neubrand (Carl Ossietsky University Oldenburg)
David Reid (University of Bremen)
Silke Ruwisch (Leuphana University Lüneburg)
Marcus Schütte (TU Dresden / University of Hamburg)
Björn Schwarz (University of Hamburg)
Jens Struckmeier (University of Hamburg, Department of Mathematics)
Maike Vollstedt (University of Bremen)
Katrin Vorhölter (University of Hamburg)

Congress Information / Overview

Date:	24th to 31st July 2016
Venue:	University of Hamburg, Congress Center / CCH, City of Hamburg, Germany
Host:	GDM, University of Hamburg, ICMI
Official language:	English
Facts and figures:	<p>3750 Scholars participate (plus 360 accompanying persons) from 106 countries 220 People are getting financial support from the solidarity grant 240 German teachers are attending supplementary activities 450 Scholars are taking part in the pre-congress Early Career Researcher Day</p> <p>2 Plenary panels and 4 Plenary speakers are presenting their work 5 ICMI awardees are presenting their work 5 Survey teams are discussing their results 3 ICMI studies present their work 6 National presentations are displayed 61 Invited lectures are held 24 scholars are preparing the activities for the thematic afternoon 42 Workshops and 38 Discussion groups are designated 1952 Papers and 530 Posters have been reviewed and accepted</p> <p>26 ICME-13 Topical Surveys are published "open access" until the congress More than 30 post-congress monographs are expected from the TSGs and other activities apart from the congress proceedings</p>
Supporters:	<p>Federal Ministry of Science, Research and Equality (BWFG) Federal Ministry of Education and Research (BMBF) German Mathematical Society (DMV) German Educational Research Association (DGfE) German Association for the Advancement of Mathematics & Science Education (MNU) DZLM Deutsche Telekom Stiftung / German Telekom Foundation German Research Society (DFG) Robert-Bosch-Stiftung / Robert-Bosch-Foundation Springer International Publishing Casio HP Texas Instruments T3 Deutschland Hamburg Convention Bureau</p>
Convenor:	<p>Gabriele Kaiser, VZD-ICME-13 e.V. c/o University of Hamburg, Faculty of Education, Von-Melle-Park 8, 20146 Hamburg convenor.icme13@uni-hamburg.de</p>
VZD-ICME-13 e.V.:	<p>Association for ICME-13 (Non-profit institution) Christine Bescherer (PH Ludwigsburg University of Education) Angelika Bikner-Ahsbahr (University of Bremen) Rudolf vom Hofe (University of Bielefeld, President of the Society of Didactics of Mathematics) Gabriele Kaiser (University of Hamburg) Günter Krauthausen (University of Hamburg) Marianne Nolte (University of Hamburg) Silke Ruwisch (Leuphana University Lüneburg, Vice President of the Society of Didactics of Mathematics) Rudolf Sträßer (University of Gießen) Hans-Georg Weigand (University of Würzburg)</p>





General Information

Location: A: grey, Congress Center / CCH, foyer

Opening hours of the Congress Office with Congress Registration:

Sunday	24 July 2016	Registration / Helpdesk Cloak Room	09.00 – 19.00 09.00 – 21.00
Monday	25 July 2016	Registration / Helpdesk Including disbursement of support for researchers from less-affluent countries	07.30 – 18.00
		Cloak Room	07.30 – 18.30
Tuesday	26 July 2016	Registration / Helpdesk Including disbursement of support for researchers from less-affluent countries	07.30 – 18.00
		Cloak Room	07.30 – 18.30
Wednesday	27 July 2016	Registration / Helpdesk Cloak Room	07.30 – 18.00 07.30 – 18.30
Thursday	28 July 2016 Excursion-Day	Helpdesk Cloak Room	07.30 – 18.00 closed
Friday	29 July 2016	Helpdesk Cloak Room	07.30 – 18.00 07.30 – 18.30
Saturday	30 July 2016	Helpdesk Cloak Room	07.30 – 18.00 07.30 – 18.30
Sunday	31 July 2016	Helpdesk Cloak Room	08.00 – 14.00 08.00 – 15.00

Printed Congress-Programme

Due to the high number of submissions the programme does not contain abstracts of single presentations. The programme with all abstracts is available via www.icme13.org or via your personal account in Conftool. Using your personal account you can access all papers and posters assigned to your TSG via the gallery function.

Help and Support

On the second sheet in your congress badge holder you will find emergency telephone numbers for exclusive usage in high emergency situations.

We have helpdesks at the **Congress Center / CCH** and at the **Auditorium Maximum** and a lot of friendly ICME-13-team-members on the Campus.

In cases of **"lost and found"** please contact our help-desk in the Congress Center / CCH.

Exhibitions

There are **exhibitions of institutions and commercial providers**:

You will find in the **East Wing Building** (B: dark-brown) Casio, Texas Instrumenst, Mintfit BWFG, T3 Deutschland, ICMI-IMU, Mathematical Association GB, Austral. Assoc. of Mathematics Teachers.

In the **West Wing Building** (D: Yellow) you will find Springer Internat. Publishing, HP,NCTM, CFEM, DZLM, Sense Publisher. In the **Auditorium Maximum** (Building J: red) there are MNU, DMV and the ICME-14 team.

ICME-13 Excursions

At Thursday, 28 July 2016 there is a rich variety of 21 different **excursions** for congress participants and accompanying persons.

Please check in time, which excursion you have selected and when and where it starts. You will find pillars with a leaflet for every excursion with the **necessary info** in the foyer of the **Congress center / CCH**. Please be at the starting point of your excursion in time. Please note that departure times of the different excursions are varying. In every bus and on every boat you will find one person as host from the GDM (German Society for Didactics of Mathematics) and an ICME-13-Team-member.

Accuracy

Please be aware, that in Germany we are planning with precise times – and e.g. a bus at the excursion will perhaps wait 5 to 6 minutes for missing persons, but certainly not longer. So please be at the right place at the right time and plan your way with an adequate **time buffer**.

Internet

Due to the very strict German Copyright Laws the free Internet is not as open as in other parts of the world. Hotspot-providers in Germany are responsible for downloads via their hotspots, i.e. for misuses of copyright regulations of texts, pictures, videos, Spams etc. These laws have just been changed to an "open world", but for our congress it is too late to get more user-friendly conditions. So we can only offer you a less comfortable workflow with individual log-ins.

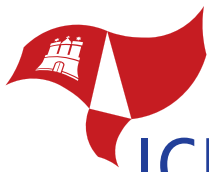
At the Congress Center / CCH an individual code for access to the hotspot of the Congress Center / CCH will be sent via text message to every participant of ICME-13. When arriving there, your electronical devices will find the net **"WiFi_SMS_CCH"** and ask you for your **personal code**. Please enter the code **"cchwlan1602"** and follow the instructions. You will receive a new code via text message, which is valid maximally 24 hours and is expiring at midnight. If you do not have a mobile phone connection, please ask the technical Help-Desk in the foyer for assistance.

At the University of Hamburg the situation is similar. We are offering you a personalised code for the University Internet, which you will find in your congress material. This code is valid for your whole stay until 31 July 2016 and functions at the whole Campus.

In your accommodation, normally you will have **free access** to the Internet.

There are several free hotspots in the city, often for free for 30 minutes; after this money is charged.





Safety

Hamburg with its 1.8 mill inhabitants from 190 nations is a safe city, but we also have areas and places, where **thieves** might look for your billfold or handbag. **Please be careful** especially at crowded places and at the red-light and club-district, the so-called Reeperbahn. Especially at these places a friendly offer for a free beer in a nightclub may become very expensive.

Banks and ATM

There are a lot of bank branches (opening times normally Mo. – Fr. between 09.00 and 18.00) around the Campus and thousands of ATM in the whole city.

Electricity

The power supply in Germany is **220 volts**.

Medical Service

Hamburg has a huge number of hospitals and medical services for every disease; in case of emergency cases the doctor will reach you in 8–10 minutes. The rescue ambulance has the telephone number 112. There is also a First-Aid-team on the Campus during the Congress – if you have serious health problems, ask a ICME-13 team member with a blue or yellow vest for help.

Meals and Refreshments ●

The University Mensa (Canteen) offers you several meals for lunch every day – just follow the signs MENSA. The quarter around the University Campus offers many supermarkets, bakeries, cafeterias and restaurants with food to reasonable prices. An American burger fast food restaurant can be found at the station Dammtor, close to the Congress Center / CCH. In our little city map of the Campus with neighbourhood we have marked the streets with the most gastronomic offers close to the University with short walking times. For the higher gastronomic level there are restaurants in the Hotel Radisson at the Congress Center / CCH or at the Elysee at the backside of the University Main Building. And, of course for dinner, thousands of restaurants with kitchen from more than 130 nations are waiting for you, located all over Hamburg.

Public Traffic

Your congress badge shows a printed little sign, which allows you to use the **complete public transport** system of the city of Hamburg **for free** (including busses, harbour ferries, overground traffic (S-Bahn) and underground traffic (U-Bahn)). The ticket is valid for the congress time, i.e. from 24 – 31 July 2016. Public transport stops their business around 00.30 in the night and starts again at about 04.00, night-busses are running. At the weekend from Friday to Sunday the trains are running through the whole night.

You can find your connections via <http://www.hvv.de/en>

Please note that this agreement with HVV **does not include** a train ride to other cities with the German Train DB! It is just valid for the area of the City of Hamburg.

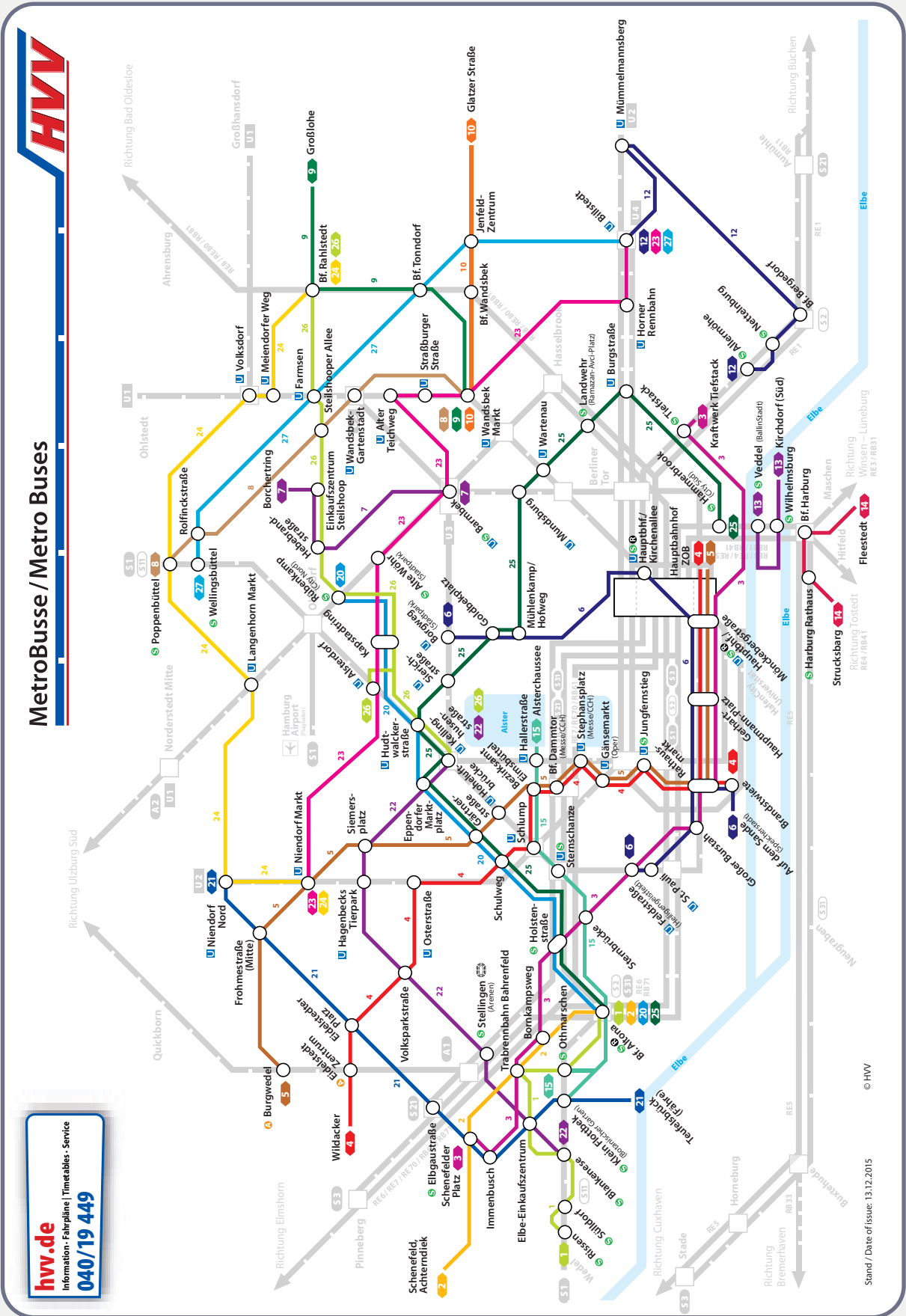
See maps on the next pages for Metro Buses and Rapid Transit / Regional Rail.

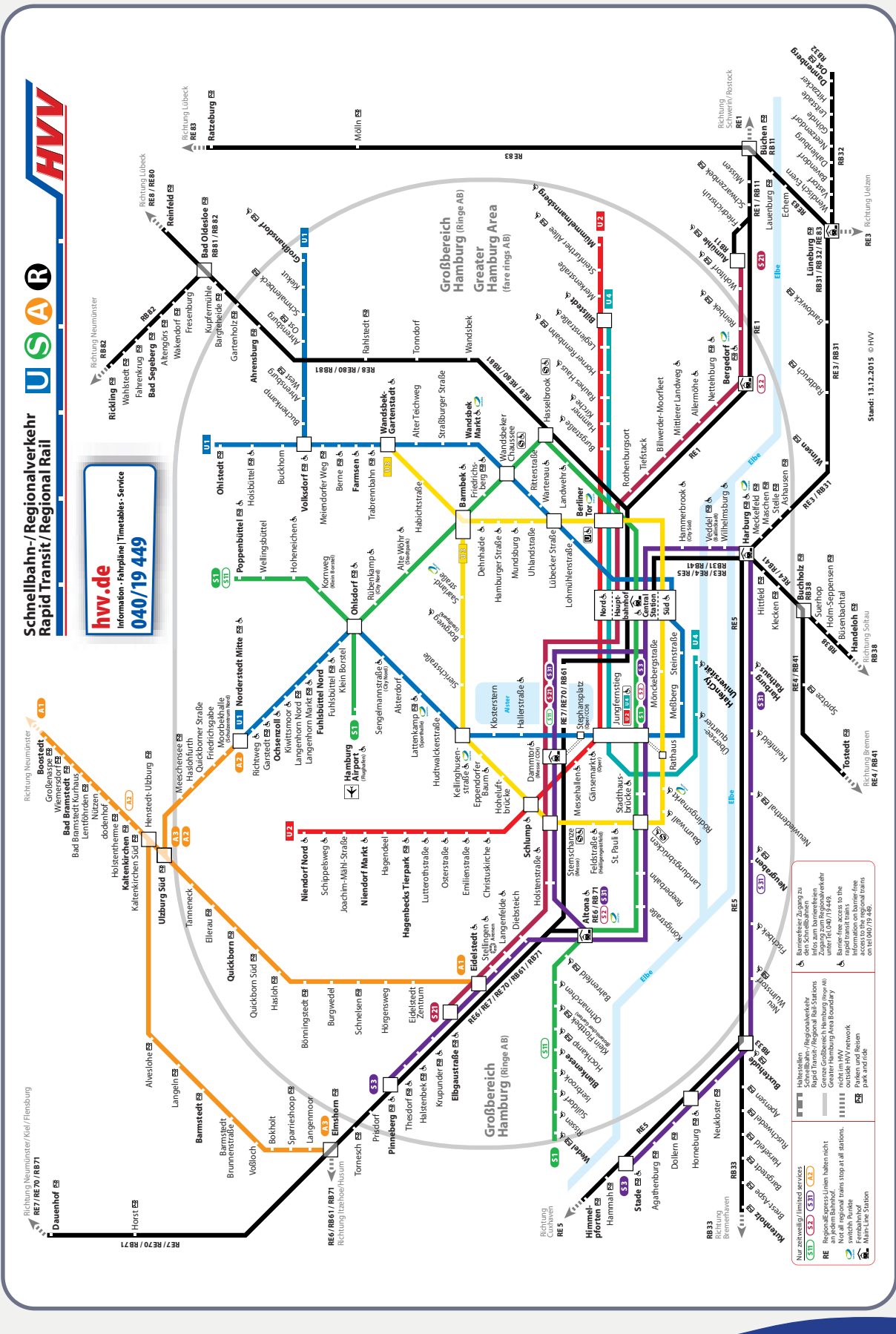
General Information





GI





HVV
U S A R
Schnellbahn-/Regionalverkehr
Rapid Transit/Regional Rail

hvv.de
 Information - Fahrpläne Timetables - Service
040/19 449

Nur zeitweilig/limited services
 RE Regional Express
 RB Regionalbahn
 S-Bahn Hamburg
 S-Bahn Regional

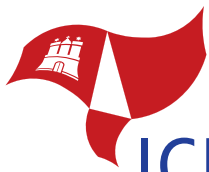
Barrierefreier Zugang zu
 Infos zum barrierefreien
 Rapid Transit/Regional Rail
 unter 040/19 449

Barrierefreie
 Zugang zu den
 Rapid Transit/Regional Rail
 unter 040/19 449

Barrierefreie
 Zugang zu den
 Rapid Transit/Regional Rail
 unter 040/19 449

Barrierefreie
 Zugang zu den
 Rapid Transit/Regional Rail
 unter 040/19 449

Stand: 13.12.2015 © HVV



Opening Ceremony

Time: Monday, 25 July 2016, 09.00 – 11.00

Location: A: grey, Congress Center / CCH lecture hall 1

Video transmission lecture hall 2

C

Mistress of the ceremony: Christine **Knipping**

Procedure

Opening of ICME-13 and welcome by the Convenor: Gabriele **Kaiser**

Greeting address by the Second Mayor of the Free and Hanseatic City of Hamburg: Katharina **Fegebank**

Greeting address by the Minister of the Federal Ministry of Education and Research: Johanna **Wanka**

Greeting address by the Vice-President of the University of Hamburg: Susanne **Rupp**

Welcome by the Chair of the LOC: Marianne **Nolte**

Cultural programme

Greeting address by the President of IMU: Shigefumi **Mori**

Greeting address by the President of ICMI: Ferdinando **Arzarello**

Greeting address by the President of the Society of Didactics of Mathematics: Rudolf **vom Hofe**

Cultural programme

Awardee ceremony presided by Ferdinando **Arzarello** and Abraham **Arcavi**:

- Felix-Klein Award: Michèle **Artigue**, Alan **Bishop**, chaired by Carolyn **Kieran**
- Hans-Freudenthal-Award: Frederick **Leung**, Jill **Adler**, chaired by Carolyn **Kieran**
- Emma-Castelnuovo-Award: Hugh **Burkhardt** and Malcolm **Swan**, chaired by Jeremy **Kilpatrick**

Cultural programme

Closing ceremony

Time: Sunday, 31 July 2016, 11.00 – 12.30

Location: A: grey, Congress Center / CCH, lecture hall 1

Master of the ceremony: Björn **Schwarz**

Welcome by the Convenor of the ceremony: Björn **Schwarz**

Report by the Secretary general of ICMI: Abraham **Arcavi**

Closing remarks by the Convenor of ICME-13: Gabriele **Kaiser**

Presentation of ICME-14: Jianpan **Wang** (Congress Chair Convenor),

Binyan **Xu** (LOC Co-Chair), Yingkang **Wu** (LOC Secretary General)

and their team

Cultural programme

Lectures of the ICMI awardees

Lectures of the ICMI awardees

All lectures will take place in parallel. Abstracts of all plenary activities can be found at the website or the web-based congress programme (Conftool).

Time: Monday, 25 July 2016, 15.00 – 16.00

Felix-Klein-Award 2013

Michèle **Artigue** (University Paris Diderot, France)

THE CHALLENGING RELATIONSHIP BETWEEN FUNDAMENTAL RESEARCH AND ACTION IN MATHEMATICS EDUCATION

Location: A: grey, Congress Center / CCH, lecture hall 2

Hans-Freudenthal-Award 2013

Frederick K. S. **Leung** (University of Hong Kong, Hong Kong – China)

MAKING SENSE OF MATHEMATICS ACHIEVEMENT IN EAST ASIA:
DOES CULTURE REALLY MATTER?

Location: A: grey, Congress Center / CCH, lecture hall 1

Felix-Klein-Award 2015

Alan J. **Bishop** (Monash University, Australia)

ELEMENTARY MATHEMATICIANS FROM ADVANCED STANDPOINTS –
A CULTURAL PERSPECTIVE ON MATHEMATICS EDUCATION

Location: J: red, Auditorium Maximum, lecture hall

Hans-Freudenthal-Award 2015

Jill **Adler** (University of the Witwatersrand, South Africa)

ONE FRAMEWORK, MULTIPLE PRACTICES: THE CASE FOR A COMMON DISCURSIVE RESOURCE

Location: C: turquoise, Main Building, lecture hall A; video transmission: lecture hall B

Emma-Castelnuovo-Award 2015

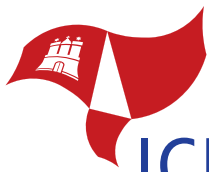
Hugh **Burkhardt** and Malcolm **Swan** (Shell Centre Nottingham, UK)

DESIGN, DEVELOPMENT AND THE SYSTEMIC IMPROVEMENT OF PRACTICE

Location: I: blue, Philosophical Tower, lecture hall A; video transmission: lecture hall B and C

IA





Plenary Activities

Location of all plenary activities: A: grey, Congress Center / CCH, lecture hall 1 with video transmission from Monday to Wednesday to lecture hall 2

Monday, 25 July 2016, 11.30–13.00

Jinfa **Cai** (Chair) (University of Delaware, USA), Ida **Mok** (University of Hong Kong, China), Vijay **Reddy** (Human Sciences Research Council, South Africa), Kaye **Stacey** (University of Melbourne, Australia)

Panel:

**INTERNATIONAL COMPARATIVE STUDIES IN MATHEMATICS:
LESSONS FOR IMPROVING STUDENTS' LEARNING**

Comparing is one of the most basic intellectual activities. We consciously make comparisons to understand where we stand, both in relation to others as well as to our own past experiences. There has been a long history of international comparative studies in education. Comparative studies not only provide information on students' achievement as examined in the context of the world's varied educational institutions, but also help identify effective aspects of educational practice. The focus of this Plenary Panel is to discuss the ways to use international comparative studies to improve students' learning. We take a strong position that the main purpose of educational research is to improve student learning. International comparative studies are not an exception.

In this panel, we use the phrase 'international comparative studies' to refer to those studies involving at least two countries, with an intention to compare at the country level. We include studies that are small and large, qualitative and quantitative, and initiatives of government and individual researchers. With this definition, we see international comparative studies in mathematics evolving from informal observations to the examination of performance differences, and from the examination of contributing factors to performance differences to the generation of theories, actions, and policies based on international comparative studies. In terms of scale, international comparative studies range from small-scale studies involving a few classes from two countries to the large-scale studies like TIMSS, PISA, and TEDS-M.

International comparative studies have completely transformed the way we see mathematics education. For example, because of the highest ranking of some Asian countries, the field of mathematics education over the years has been interested in mathematics education in Asian countries. We used to think that there was one basic way of teaching mathematics; international comparative studies, however, showed us many different ways of teaching mathematics in the classroom. We also learned that some student background variables (e.g., attitudes, gender) operate in different ways for students in different countries. With this panel, we have selected four lessons that we can learn from international comparative studies about improving students' learning: (1) understanding students' thinking, (2) examining the dispositions and experiences of mathematically literate students, (3) changing classroom instruction, and (4) making global research locally meaningful. We decided to focus on these four aspects because of their importance for the impact on students' learning. The first two lessons focus on students' mathematical thinking and literacy. The third lesson focuses on classroom instruction, and the fourth lesson focuses on policy in the local context. We have used both small- and large-scale international comparative studies to illustrate the lessons we can learn.

Tuesday, 26 July 2016, 08.30 – 09.30

Bill **Barton** (University of Auckland, New Zealand)

MATHEMATICS, EDUCATION AND CULTURE: A CONTEMPORARY MORAL IMPERATIVE

Ubiratan D'Ambrosio, in his plenary at ICME-5 in Adelaide in 1984, challenged us as mathematics educators to understand the relationship between mathematics, education and culture. He used the term 'ethnomathematics' to refer to the historical, political and cultural dimensions of mathematics and their relation to society. In subsequent writing he exposed humans' responsibility to build a just and beautiful world on the "dorsal spine" of mathematics.

I will reflect on the reverberations of his work in the wider mathematics education community, and express some opinions about how this sub-field might contribute to resolving the cross-cultural crises that pervade contemporary society. Most of all, I offer some practical suggestions on how each of us, as individuals and communities, might nurture a gentle, beautiful, and productive peacock on the dorsal spine of mathematics, rather than an amoral monster that tramples much beneath it while leading the technological charge into the future.

Wednesday, 27 July 2016, 08.30 – 09.30

Günter M. **Ziegler** (Freie Universität Berlin, Germany)

"WHAT IS MATHEMATICS?" – AND WHY WE SHOULD ASK, WHERE ONE SHOULD EXPERIENCE OR LEARN THAT, AND WHO CAN TEACH IT

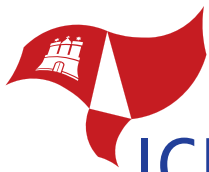
"What is Mathematics?" (with a question mark!) is the title of a famous book by Courant and Robbins, first published in 1941, which does not answer the question. The question is, however, essential: The public image of the subject (of the science, and of the profession) is not only relevant for the support and funding it can get, but it is also crucial for the talent it manages to attract – and thus ultimately determines what mathematics can achieve, as a science, as a part of human culture, but also as a substantial component of economy and technology.

"What does Doing Mathematics mean?" Is it realistic to say that anyone who teaches Mathematics should do that on the basis of a first-hand research experience in Mathematics? Weierstrass was a teacher for a number of years. Is he the teacher we want or need for the 21st Century high school education?

In this lecture we thus

- discuss the image of mathematics (where "image" might be taken literally!),
- sketch a multi-facetted answer to the question "What is Mathematics?,"
- try to give an equally multi-facetted answer to the question what "Doing Mathematics" might mean,
- stress the importance of learning "What is Mathematics" in view of Klein's "double discontinuity" in mathematics teacher education, as observed by Felix Klein in 1908,
- present the "Panorama project" as our response to this challenge,
- stress the importance of telling stories in addition to teaching mathematics, and finally
- suggest that the mathematics curricula at schools and at universities should correspondingly have space and time for at least three different subjects called Mathematics.





Friday, 29 July 2016, 08.30 – 09.30

Berinderjeet **Kaur** (National Institute of Education, Singapore)

MATHEMATICS CLASSROOM STUDIES – MULTIPLE WINDOWS AND PERSPECTIVES

In some ways, the Third International Mathematics and Science Study (TIMSS) Video Studies of 1995 (Stigler et al., 1999) and 1999 (Hiebert et al., 2003) may be said to be the impetus for classroom studies in many countries. These studies created an awareness of how vast video data were and the possibilities of endless rich analysis. They also stimulated thought and academic discourse, about the conceptual framework and methodology of such studies, which led to subsequent video studies like the Learner's Perspective Study (LPS) (Clarke, Keitel & Shimizu, 2006). This lecture will draw on mathematics classroom studies in Singapore, Hogan et al., (2013) and Kaur, (2009), and illustrate that using a particular frame (window) of analysis a "drill and practice" segment of a lesson was a "systematic consolidation of knowledge" segment when an alternative frame was used. It will also show that a "teacher-centred" lesson from one perspective was a "student-centred" lesson from another perspective and more. The lecture will end with some thoughts about what considerations are critical, for both the collection of video data and its analysis, when studying mathematics classrooms.

PA

Saturday, 30 July 2016, 08.30 – 09.30

Deborah **Loewenberg Ball** (University of Michigan, USA)

UNCOVERING THE SPECIAL MATHEMATICAL PRACTICES OF TEACHING

Helping young people develop mathematical skills, ways of thinking, and identities, and supporting classrooms as equitable communities of practice, entails for teachers a specialized set of instructional skills specific to the domain. What is involved, for example, in being able to see and hear the mathematics in students' experiences, in speaking mathematics in ways that are attuned to one's students, or in using representations and public records in ways that are comprehensible by students? We will examine instances of this sensitive work, analyze the special kinds of mathematical and other skills and orientations involved for teachers, and consider how fluency with such practices can be developed and supported.

Sunday, 31 July 2016, 09.00 – 10.30

Panel:

Ghislaine **Gueudet** (Chair) (University of Brest, France), Marianna **Bosch** (Universitat Ramon Llull, Spain), Andrea **diSessa** (University of California Berkeley, USA), Oh Nam Kwon (Seoul National University, Korea), Lieven **Verschaffel** (University of Leuven, Belgium)

TRANSITIONS IN MATHEMATICS EDUCATION

This panel addresses crucial issues concerning transitions in mathematics education (crucial for students, teachers, teacher educators, and researchers), and proposes a debate around sensitive questions related with these transitions.

Within an educational context any change can be viewed as a transition. In this panel we mainly consider two kinds of changes (separately or simultaneously):

- Conceptual change and learning as transition processes;
- Transitions between social groups or contexts with different mathematical practices.

We address mathematics teaching and learning at all ages: from preschool to university, and in the workplace (including the teachers' passage from university to school).

Firstly, we synthesize research on these topics: what specific questions have been addressed; what findings were obtained. We show how different theoretical perspectives focus on different questions and obtain different results even concerning the same transitions, and we show how the articulation of different theoretical perspectives can enrich the analysis of transitions. Then we discuss sensitive issues, in particular:

- Are some transitions best viewed as continuous processes, or should they all be viewed as discontinuous?
- In the case of discontinuities, do they inevitably cause or constitute difficulties, or do they also offer productive opportunities, and how?
- In the case of continuities, how do we conceptualize both difficulties and opportunities?

Finally, drawing on the research synthesized and on the discussion about the above questions, we present different kinds of teaching interventions or teacher education programs (actual or potential) likely to support students and teachers in the transition process.

PA





Invited Lectures (formerly Regular Lectures)

Slot 1: Tuesday, 26 July 2016, 10.30 – 11.30

Arthur **Bakker** (Utrecht University, Netherlands)
[EMBODIED DESIGN OF PROPORTIONAL REASONING](#)
Location: I: blue, Philosophical Tower, lecture hall A

Albrecht **Beutelispacher** (Mathematikum, Germany)
[MATHEMATICAL EXPERIMENTS – AN IDEAL FIRST STEP INTO MATHEMATICS](#)
Location: D: yellow, West Wing Building, room 221

Sigrid **Blömeke** (University of Oslo, Norway)
[UNDERSTANDING MATHEMATICS TEACHERS' COMPETENCIES AS PERSONALLY, SITUATIONALLY AND SOCIALLY DETERMINED](#)
Location: B: dark-brown, East Wing Building, room 221

Anthony A. **Essien** (University of the Witwatersrand, South Africa)
[PREPARING PRE-SERVICE MATHEMATICS TEACHERS TO TEACH IN MULTILINGUAL CLASSROOMS: A COMMUNITY OF PRACTICE PERSPECTIVE](#)
Location: I: blue, Philosophical Tower, lecture hall F

Rina **Hershkowitz** (Weizmann Institute for Science, Israel) & Stefan Ufer (LMU München, Germany)
[WHAT DOES PME CONTRIBUTE TO MATHEMATICS EDUCATION?](#)
Location: I: blue, Philosophical Tower, lecture hall C

Luckson **Kaino** (Tumaini University, Tanzania)
[EXPLORING STUDENTS' AND TEACHERS' KNOWLEDGE OF MATHEMATICAL MODELING IN LINEAR EQUATIONS](#)
Location: C: turquoise, Main Building, lecture hall C

Petar **Kenderov** (Institute of Mathematics and Informatics, Bulgaria)
[THERE IS NO SUCH PROBLEM!](#)
Location: C: turquoise, Main Building, lecture hall M

Masataka **Koyama** (Hiroshima University, Japan)
[TWO-AXIS PROCESS MODEL FOR TEACHING AND LEARNING OF SCHOOL MATHEMATICS](#)
Location: I: blue, Philosophical Tower, lecture hall G

Kyeong-Hwa **Lee** (Seoul National University, Republic of South Korea)
[DOES THE ANSWER DEAL WITH THE COMPLEXITIES? STEERING REFLECTIVE MODIFICATION OF MATHEMATICAL TASKS](#)
Location: C: turquoise, Main Building, lecture hall B

William **McCallum** (University of Arizona, United States of America)
[LEARNING MODERN ALGEBRA FROM EARLY ATTEMPTS TO PROVE FERMAT'S LAST THEOREM: A COURSE FOR PROSPECTIVE TEACHERS](#)
Location: C: turquoise, Main Building, lecture hall A

Cynthia **Nicol** (University of British Columbia, Canada)
[CONNECTING MATHEMATICS, COMMUNITY, CULTURE AND PLACE: PROMISE, POSSIBILITIES AND PROBLEMS](#)
Location: I: blue, Philosophical Tower, lecture hall D

Invited Lectures

Judith **Njomgang Ngansop** (University of Yaounde, Cameroon)

RELEVANCE OF LEARNING LOGICAL ANALYSIS OF MATHEMATICAL STATEMENTS

Location: I: blue, Philosophical Tower, lecture hall E

Janine **Remillard** (University of Pennsylvania, United States of America)

TEACHERS' DESIGN DECISIONS AND THE ROLE OF INSTRUCTIONAL RESOURCES

Location: I: blue, Philosophical Tower, lecture hall B

Jianyue **Zhang** (People's Education Press, People's Republic of China)

THE REFORM AND DEVELOPMENT OF PLANE GEOMETRY MIDDLE SCHOOL COURSE IN CHINA

Location: C: turquoise, Main Building, lecture hall J

Meet the Plenary Speaker (Bill **Barton**)

Location: D: yellow, West Wing Building, Room 222

Slot 2: Wednesday, 27 July 2016, 10.30 – 11.30

Andrea **diSessa** (University of California, Berkeley, United States of America)

KNOWLEDGE IN PIECES: A FRAMEWORK FOR STUDYING LEARNING AT HIGH RESOLUTION

Location: C: turquoise, Main Building, lecture hall B

Nouzha **El Yacoubi** (University Mohammed V Rabat, Morocco)

TOWARDS COLLABORATIVE PROGRAMS IMPROVING THE MATHEMATICS TEACHER PROFESSIONAL DEVELOPMENT IN AFRICA!

Location: D: yellow, West Wing Building, room 221

Alena **Hošpesová** (University of South Bohemia, Czech Republic)

FORMATIVE ASSESSMENT IN INQUIRY BASED ELEMENTARY MATHEMATICS

Location: I: blue, Philosophical Tower, lecture hall C

Ronnie **Karsenty** (Weizmann Institute of Science, Israel)

PROFESSIONAL DEVELOPMENT OF MATHEMATICS TEACHERS: THROUGH THE LENS OF THE CAMERA

Location: C: turquoise, Main Building, lecture hall A

Jorge **Soto-Andrade** (University of Chile, Chile)

ENACTIVE METAPHORING IN THE LEARNING OF MATHEMATICS

Location: I: blue, Philosophical Tower, lecture hall G

Alina **Spinillo** (Federal University of Pernambuco, Brazil)

NUMBER SENSE IN ELEMENTARY SCHOOL CHILDREN: THE USES AND MEANINGS GIVEN TO NUMBERS IN DIFFERENT INVESTIGATIVE SITUATIONS

Location: C: turquoise, Main Building, lecture hall C

Denis **Tanguay** (Université du Québec à Montréal, Canada)

THE COORDINATION BETWEEN THE GEOMETRIC FIGURE AND THE ASSOCIATED MAGNITUDE, WITHIN THE CONCEPTUAL GENESIS OF ANGLE

Location: I: blue, Philosophical Tower, lecture hall B

Mike **Thomas** (Auckland University, New Zealand)

BUILDING UP MATHEMATICS: THE LEGACY OF ZOLTÁN DIÉNÈS

Location: I: blue, Philosophical Tower, lecture hall D

IL





Zulbiye **Toluk Ucar** (Abant İzzet Baysal University, Turkey)
ISSUES IN TEACHING AND LEARNING FRACTIONS
Location: I: blue, Philosophical Tower, lecture hall E

Fabrice **Vandebrouck** (University Paris Diderot, France)
ACTIVITY THEORY IN FRENCH DIDACTIC
Location: I: blue, Philosophical Tower, lecture hall F

Ivan **Vysotskiy** (Moscow Center for Continuous Mathematical Education, Russian Federation)
POPULARIZATION OF THE PROBABILITIES THEORY AND STATISTICS IN SCHOOL THROUGH THE INTELLECTUAL COMPETITIONS
Location: C: turquoise, Main Building, lecture hall J

Helena **Wessels** (Stellenbosch University, South Africa)
NOTICING IN PRESERVICE TEACHER EDUCATION USING RESEARCH LESSONS AS CONTEXT FOR REFLECTION ON STUDENT THINKING LEARNING
Location: B: dark-brown, East Wing Building, room 221

Rina **Zazkis** (Simon Fraser University, Canada)
DIALOGUES ON NUMBER THEORY
Location: I: blue, Philosophical Tower, lecture hall A

Yan **Zhu** (East China Normal University, People's Republic of China)
EQUITY IN MATHEMATICS EDUCATION: WHAT DID TIMSS AND PISA TELL US IN THE LAST TWO DECADES?
Location: C: turquoise, Main Building, lecture hall M

Meet the Plenary Speaker (Günter M. **Ziegler**)
Location: D: yellow, West Wing Building, Room 222

Slot 3: Friday, 29 July 2016, 10.30 – 11.30

Faïza **Chellougui** (University of Carthage, Tunisia)
STUDENTS' USE OF CALCULUS FORMALISM AT THE FIRST YEAR UNIVERSITY
Location: I: blue, Philosophical Tower, lecture hall G

Nancy **Chitera** (University of Malawi, Malawi)
THERE IS MORE TO THE TEACHING AND LEARNING OF MATHEMATICS THAN THE USE OF LOCAL LANGUAGES: MATHEMATICS TEACHER PRACTICES
Location: C: turquoise, Main Building, lecture hall M

Michael N. **Fried** (Ben Gurion University of the Negev, Israel)
HISTORY OF MATHEMATICS, MATHEMATICS EDUCATION, AND THE LIBERAL ARTS
Location: C: turquoise, Main Building, lecture hall A

Inés María **Gómez-Chacón** (Universidad Complutense de Madrid, Spain)
HIDDEN CONNECTIONS, DOUBLE MEANINGS: A MATHEMATICAL EXPLORATION OF AFFECTIVE AND COGNITIVE INTERACTIONS IN LEARNING
Location: C: turquoise, Main Building, lecture hall B

Günter **Krauthausen** (University of Hamburg, Germany)
NATURAL DIFFERENTIATION – AN APPROACH TO COPE WITH HETEROGENEITY
Location: D: yellow, West Wing Building, room 221

Invited Lectures

Yukihiko **Namikawa** (Sugiyama Jogakuen University, Japan)
MATHEMATICAL LITERACY AND CURRICULUM BASED ON IT – WITH SEVERAL
REALIZATIONS IN JAPAN

Location: C: turquoise, Main Building, lecture hall J

Ricardo **Nemirovski** (San Diego State University, United States of America)
CRAFTING INFORMAL MATHEMATICS EDUCATION: LEARNING ABOUT CURVATURE AND
BASKET WEAVING

Location: I: blue, Philosophical Tower, lecture hall D

Arthur **Powell** (Rutgers University, United States of America)
SOCIAL AND DISCURSIVE ACTIONS TO PROMOTE ONLINE COLLABORATIVE,
MATHEMATICAL PRACTICES

Location: I: blue, Philosophical Tower, lecture hall A

Kurt **Reusser** (University of Zürich, Switzerland)
WHAT LARGE SCALE VIDEO STUDIES TELL US ABOUT THE IMPACT OF SURFACE AND DEEP
LEVEL FEATURES OF INSTRUCTION ON STUDENTS

Location: B: dark-brown, East Wing Building, room 221

Jeremy **Roschelle** (SRI International, United States of America)
TECHNOLOGY FOR LEARNING MATHEMATICS: WHAT CAN WE LEARN FROM
LARGE-SCALE STUDIES?

Location: I: blue, Philosophical Tower, lecture hall C

Carmen **Sessa** (Universidad Pedagógica de Buenos Aires, Argentine Republic)
EXPLORING WITH TEACHERS THE FUNCTIONAL WORLD IN AN ENRICHED
ENVIRONMENT WITH COMPUTERS

Location: I: blue, Philosophical Tower, lecture hall E

Yahya **Tabesh** (Sharif University of Technology, Islamic Republic of Iran)
DIGITAL PEDAGOGY IN MATH LEARNING

Location: C: turquoise, Main Building, lecture hall C

Nad'a **Vondrová** (Charles University in Prague, Czech Republic)
ABILITY TO NOTICE OR PROFESSIONAL VISION OF (FUTURE) MATHEMATICS TEACHERS

Location: I: blue, Philosophical Tower, lecture hall B

Meet the Plenary Speaker (Berinderjeet **Kaur**)

Location: D: yellow, West Wing Building, Room 222

Slot 4: Saturday, 30 July 2016, 10.30 – 11.30

Betina **Duarte** (Universidad Pedagógica, Argentine Republic)
VALIDATIONS AND REASONING IN MATHEMATICS: THE ROLE OF ANTICIPATION AS A
FRAMEWORK FOR TEACHER INTERVENTIONS

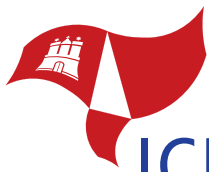
Location: D: yellow, West Wing Building, room 221

Ann **Gervasoni** (Monash University, Australia)
THE IMPACT AND CHALLENGES OF EARLY MATHEMATICS INTERVENTION IN
AUSTRALIAN CONTEXTS

Location: I: blue, Philosophical Tower, lecture hall D

IL





Ansie **Harding** (University of Pretoria, South Africa)
THE ROLE OF STORYTELLING IN TEACHING MATHEMATICS
Location: I: blue, Philosophical Tower, lecture hall G

Roza **Leikin** (University of Haifa, Israel)
**HOW CAN COGNITIVE NEURO-SCIENCE CONTRIBUTE TO MATHEMATICS EDUCATION?
FOCUSING ON PROBLEM SOLVING AND CREATIVITY IN MATH**
Location: C: turquoise, Main Building, lecture hall A

Yeping **Li** (Texas A&M University, United States of America)
THE CHALLENGE OF DEVELOPING EXPERTISE IN MATHEMATICS TEACHING
Location: C: turquoise, Main Building, lecture hall B

Mdutshekela **Ndlovu** (Stellenbosch University, South Africa)
**THEMES, PARADIGMS AND THEORIES IN RESEARCH ON THE PROFESSIONAL
DEVELOPMENT OF MATHEMATICS TEACHERS IN SOUTH AFRICA**
Location: B: dark-brown, East Wing Building, room 221

Asuman **Oktac** (Cinvestav-IPN, Mexico)
EXPLORATIONS WITH LINEAR ALGEBRA LEARNING
Location: C: turquoise, Main Building, lecture hall M

Ruth **Rodriguez** (Tecnologico de Monterrey, Mexico)
**BUILDING COMMUNICATION BRIDGES BETWEEN MATH EDUCATION AND ENGINEERING
EDUCATION COMMUNITIES A DIALOGUE THROUGH MODELLING**
Location: C: turquoise, Main Building, lecture hall J

Kenneth **Ruthven** (University of Cambridge, United Kingdom)
**CONSTRUCTING DYNAMIC GEOMETRY: THE INTERPRETATIVE FLEXIBILITY OF
MATHEMATICAL SOFTWARE IN TEACHING PRACTICE**
Location: I: blue, Philosophical Tower, lecture hall A

Cristina **Sabena** (Università di Torino, Italy)
**GESTURES AND MULTIMODALITY IN MATHEMATICS CLASSROOM ACTIVITIES:
A SEMIOTIC PERSPECTIVE**
Location: I: blue, Philosophical Tower, lecture hall C

Xuhua **Sun** (University of Macau, Macau S.A.R. (China))
**UNCOVERING CHINESE PEDAGOGY: SPIRAL VARIATION – THE UNSPOKEN PRINCIPLE
FOR ALGEBRA THINKING TO DEVELOP CHINESE CURRICULUM**
Location: I: blue, Philosophical Tower, lecture hall B

Meet the Plenary Speaker (Deborah Loewenberg Ball)
Location: D: yellow, West Wing Building, Room 222

Slot 5: Saturday, 30 July 2016, 15.00 –16.00

Glenda **Anthony** (Massey University, New Zealand)
PRACTICE-BASED LEARNING IN INITIAL TEACHER EDUCATION: DEVELOPING INQUIRING PROFESSIONALS

Location: B: dark-brown, East Wing Building, room 221

Marta **Civil** (University of Arizona, United States of America)
INTERSECTIONS OF CULTURE, LANGUAGE, AND MATHEMATICS EDUCATION: LOOKING BACK AND LOOKING AHEAD

Location: C: turquoise, Main Building, lecture hall B

Linda **Furuto** (University of Hawaii at Manoa, United States of America)
PACIFIC ETHNOMATHEMATICS: NAVIGATING ANCIENT WISDOM AND MODERN CONNECTIONS

Location: D: yellow, West Wing Building, room 221

Liv Sissel **Grønmo** (University of Oslo, Norway)
THE ROLE OF ALGEBRA IN SCHOOL MATHEMATICS

Location: I: blue, Philosophical Tower, lecture hall G

Bernard R. **Hodgson** (Université Laval, Canada), Mogens **Niss** (Roskilde University, Denmark)
ICMI 1966-2016, A DOUBLE INSIDERS' VIEW OF KEY ISSUES FROM THE LATEST HALF CENTURY OF THE INTERNATIONAL COMMISSION

Location: C: turquoise, Main Building, lecture hall A

Boris **Koichu** (Technion – Israel Institute of Technology, Israel)
MATHEMATICAL PROBLEM SOLVING IN CHOICE-AFFLUENT ENVIRONMENTS

Location: I: blue, Philosophical Tower, lecture hall A

Mehmet Fatih **Özmantar** (University of Gaziantep, Turkey)
MATHEMATICS TEACHER EDUCATORS' KNOWLEDGE SOURCES IN COMING TO KNOW AN EFFECTIVE MATHEMATICS TEACHING

Location: C: turquoise, Main Building, lecture hall M

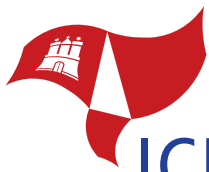
Wee Tiong **Seah** (University of Melbourne, Australia)
USING THE VALUES FRAMEWORK TO UNDERSTAND AND IMPROVE MATHEMATICS PEDAGOGY: EVIDENCE FROM FIVE CONTINENTS

Location: I: blue, Philosophical Tower, lecture hall B

Jeppe **Skott** (Linnaeus University, Sweden)
TEACHER IDENTITY REVISITED: RE-CENTRING THE INDIVIDUAL IN PARTICIPATORY ACCOUNTS OF PROFESSIONAL LEARNING

Location: I: blue, Philosophical Tower, lecture hall D





ICMI Studies and Survey Teams

Time: Monday, 25 July 2016, 16.30 – 18.00

All sessions take place in parallel.

ICMI Studies

Location: C: turquoise, Main Building, lecture hall A, Video Transmission: Main Building, lecture hall B, C

The following ICMI Studies will present their results:

- ICMI Study 21 on Mathematics Education and Language Diversity
IPC members: Richard **Barwell**, Philip **Clarkson**, Anjum **Halai**, Mercy **Kazima**, Judit **Moschkovich**, Núria **Planas**, Mamokgethi Setati **Phakeng**, Paola **Valero**, Martha Villavicencio **Ubillús**
- ICMI Study 22 on Task Design
Study Chairs: Anne **Watson** and Minoru **Ohtani**
- ICMI Study 23 on Primary Mathematics Study on Whole Numbers
Study chairs: Mariolina **Bartolini** and Xuhua **Sun**

Surveys Teams

First results of the survey teams are reported in ZDM Mathematics Education, 2016, 48(5), available at ICME-13.

Location: J: red, Auditorium Maximum, lecture hall

Study Chair: Marcelo **Borba** (UNESP)

Study Team: Mario Sanchez **Aguilar** (CICATA Legaria), Petek **Askar** (Hacettepe University), Johann **Engelbrecht** (University of Pretoria), Salvador **Llinares** (University of Alicante)
DISTANCE LEARNING, BLENDED LEARNING, E-LEARNING IN MATHEMATICS (INCLUDING MOOC)

Abstract: Digital technology has changed the possibilities of (mathematics) education. In particular the popularization of the Internet has created a new wave of distance mathematics education, such as online mathematics courses, in which there is only virtual contact between the teacher and their students. The Internet created many changes for the 21st century classrooms, with combinations of face to-face and distance learning termed 'blended learning'. This survey team will study research in this area, from both a theoretically and practical standpoint.

It will address questions such as:

- How is the Internet becoming "an actor" in the classroom?
- Is the Internet becoming pervasive in the classroom or is it creating a new meaning to what we think of as a classroom?
- Will the internet eventually mean the end of classrooms as we know them?
- Has the internet changed how we think of initial and continuing teacher education?
- What are the cultural, economic and political questions to be aware of as different countries experience different degrees of internet driven changes in mathematics education?

ICMI Studies & Survey Teams

Location: A: grey, Congress Center / CCH, lecture hall 1

Study Chair: Barbara **Jaworski** (Loughborough University)

Study Team: Olive **Chapman** (University of Calgary), Cristina **Esteley** (Universidad Nacional de Córdoba), Merrilyn **Goos** (University of Queensland), Masami **Isoda** (Tsukuba University), Marie **Joubert** (African Institute for Mathematical Sciences), Ornella **Robutti** (Università di Torino), Anne **Bennison** (University of Queensland), Alison **Clark-Wilson** (University College London), Annalisa **Cusi** (Università di Torino)
[TEACHERS WORKING AND LEARNING THROUGH COLLABORATION](#)

Abstract: Central to the learning of mathematics around the world is the work that teachers do in institutional settings and beyond, bringing mathematics to their students and supporting their students' learning. It has long been recognized that teaching mathematics is a complex enterprise devolving from the nature of mathematics itself and drawing on a wide range of knowledge and skills. Teachers have not only to know mathematics but also to demonstrate didactical, pedagogical, technological, social and ethical knowledge in working with their students at any level. They have to work according to societal, political and institutional demands which shape and challenge their professional, personal, social and cultural identities. Teaching itself is a learning process in which reflections on teaching, in practice or in professional development activity, lead to new understandings of mathematics teaching and its development. Our knowledge of this complex scene has developed considerably in recent years, supported amongst others by a new journal Journal of Mathematics Teacher Education, an ICMI Study on The Professional Education and Development of Teachers of Mathematics in 2005 and an associated study volume (Even and Loewenberg Ball 2009), a Handbook of Mathematics Teacher Education (Wood, Jaworski, Krainer, Sullivan and Tirosh, 2008). Research in this survey shows a burgeoning of published papers and journal special issues illuminating this field.

Location: H: orange, Educational Building, lecture hall

Video Transmission: Educational Building, room 05

Study Chair: Mogens **Niss** (Roskilde University)

Study Team: Regina **Bruder** (TU Darmstadt), Kyungmee **Park** (Hongik University), Nuria **Planas** (University Autonomous of Barcelona), Ross **Turner** (Australian Council for Educational Research), Jhony Alexander **Villa-Ochoa** (University de Antioquia)
[CONCEPTUALISATION OF THE ROLE OF COMPETENCIES, KNOWING AND KNOWLEDGE IN MATHEMATICS EDUCATION RESEARCH](#)

Abstract: This talk presents the outcomes of the work of the ICME 13 Survey Team on 'Conceptualisation of the role of competencies, knowing and knowledge in mathematics education research'.

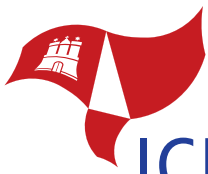
Location: A: grey, Congress Center / CCH, lecture hall 2

Study Chair: Nathalie **Sinclair** (Simon Fraser University)

Study Team: Maria G. Bartolini **Bussi** (UNIMORE), Keith **Jones** (University of Southampton), Ulrich **Kortenkamp** (Universität Potsdam), Allen **Leung** (Hong Kong Baptist University), Kay **Owens** (Charles Sturt University), Alexey **Zaslavsky** (Central Institute of Economics and Mathematics)
[GEOMETRY \(INCLUDING TECHNOLOGY\)](#)

Abstract: This survey on the theme of Geometry Education (including new technologies) focuses chiefly on the time span since 2008. Based on our review of the literature published during this time span (in refereed journal articles, conference proceedings and edited books), we have jointly identified seven major threads of contributions as these relate to the early years of learning (pre-school and primary school) through to post-compulsory education and to the issue of mathematics teacher education for geometry.

ST



Location: I: blue, Philosophical Tower, lecture hall A

Video Transmission 1: Philosophical Tower, lecture hall B, C

Study Chair: Petra **Scherer** (University of Duisburg-Essen)

Study Team: Kim **Beswick** (University of Tasmania), Lucie **DeBlois** (Université Laval);
Lulu **Healy** (Universidade Anhanguera de São Paulo), Elisabeth **Moser Opitz** (University of Zürich)
**SURVEY ON "ASSISTANCE OF STUDENTS WITH MATHEMATICAL LEARNING DIFFICULTIES –
HOW CAN RESEARCH SUPPORT PRACTICE?"**

Abstract: The planned survey will concentrate on the following aspects and questions:

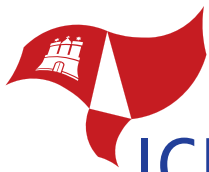
- 1) Definitions of ›learning difficulties in mathematics‹ and ›mathematical learning difficulties‹ in different countries: What are predictors for mathematical disabilities? What are specific mathematical topics the students show poor competencies in?
- 2) Professional teacher knowledge for assistance of students with LD: The role of teachers' beliefs about and expectations of students who underperform in mathematics will be taken into account as well as the role of teachers' professional knowledge.
- 3) What do we know about effective teaching practices in (inclusive) mathematics classrooms? – Intervention studies. This aspect deals with the different research fields of mathematics education and special education and resulting requirements and problems for research that arise.
- 4) Concepts of assistance: This part will focus on concrete examples showing students' practices and behaviour when interacting with mathematics and considering pupils' behaviour in mathematics learning settings.

All four aspects will be discussed from an international as well as national perspective. The team will review international research results as well as national features and developments. Concerning the activities of ICMEs, the period from ICME-10 in 2004 will be included.

ICMI Studies & Survey Teams

ST





ICMI Affiliate Organisations

Time: Saturday, 30 July 2016, 16.30 – 18.00 (Parallel Presentations)

More details on the programme of each ICMI Affiliate organisation can be found in the electronic version of the programme of ICME-13.

Location: C: turquoise, Main Building, lecture hall B

Organisers: Angel **Ruiz*** (University of Costa Rica), Diane **Briars**, Matt **Larson** (National Council of Teachers of Mathematics), Patrick Rick **Scott** (U.S. Board on International Scientific Organizations)
CIAM: INTER-AMERICAN COMMITTEE ON MATHEMATICS EDUCATION

Abstract: How can we effectively build the student learning presented in national curricular principles? What strategies and perspectives should guide teacher actions to ensure student learning? What sort of teacher professional development can support needed actions? These concerns which are so central to Mathematics Education are addressed by many theoretical results and experiences. The National Council of Teachers of Mathematics (NCTM, 2014) recently published "Principles to Actions: Ensuring Mathematical Success for All" which presents guidelines for guaranteeing mathematical success for all students. Similar strategies and perspectives support the implementation of curricular reform in Mathematics Education for elementary and secondary schools in Costa Rica.

Location: B: dark-brown, East Wing Building, room 221

Organisers: Peter **Appelbaum*** (Arcadia University), Charoula **Stathopoulou** (University of Thessaly), Gilles **Aldon** (ENS Lyon), Uwe **Gellert** (Freie Universität Berlin), Fernando **Hitt** (Université du Québec à Montréal), Christina **Sabena** (Università di Torino)
C.I.E.A.E.M. COMMISSION INTERNATIONALE POUR L'ÉTUDE ET L'AMÉLIORATION DE L'ENSEIGNEMENT DES MATHÉMATIQUES

Abstract: The CIEAEM session aims at communicating current and future activities of CIEAEM to the mathematics education community. Just before ICME-13, CIEAEM will have held its 68th annual meeting. On that meeting, the contributions to research and educational practice of CIEAEM during the last 10 years or so will be synthesised and discussed under the headings of "Integration of theory and practice and/or/versus (evidence-based) research as a service to practice", "Mathematisation and the role of mathematical model(ling)s", "Towards a post-PISA curriculum?", and "How can research / CIEAEM learn from the inside of the classroom?". The presentation of CIEAEM at ICME-13 will offer insight into the unique style of communication during CIEAEM conferences, which are characterised by their ample space for collaborative discussion.

ICMI Affiliate Organisations

Location: K: purple, Law Building, lecture hall

Organisers: Viviane **Durand-Guerrier** (University of Montpellier), Cristina **Sabena*** (University of Torino), Stefan **Zehetmeier** (University of Klagenfurt), Despina **Potari** (National and Kapodistrian University of Athens), Miguel **Ribeiro** (University of Klagenfurt)

ERME: EUROPEAN SOCIETY FOR RESEARCH IN MATHEMATICS EDUCATION

Abstract: ERME has been established for promoting communication, cooperation and collaboration among European researchers (and increasingly with neighbor countries of Europe). The core of the ERME research activities is organized within in the so-called Thematic Working Groups, which meet bi-annually at the Congress of ERME. To present current developments and issues of research within ERME, a collaboration of three Thematic Working Groups concerned with the development and research of mathematics teachers will give insights into their work. The study of mathematics teacher education and professional development has been a central focus of research during the last decades and has been focused also within ERME activities. Research programs focused on topics like reflection, collaboration, or teachers' professional growth. In particular, models and programs of professional development, as well as their respective contents, methods, and impacts were described and analysed. Research increasingly focused not only on the participating teachers, but also on the role of teacher educators and academic researchers.

Location: I: blue, Philosophical Tower, lecture hall E

Organisers: Susanne **Prediger** (TU Dortmund), Susanne **Schnell** (University of Cologne), Jason **Cooper** (Weizmann Institute), Raja **Herold*** (University Duisburg-Essen), Angel **Mizzi** (University Duisburg-Essen)

ERME/YERME: YOUNG RESEARCHERS IN MATHEMATICS EDUCATION

Abstract: YERME is the young researcher association of ERME, which is specifically engaged in supporting early career researchers. Due to the interest in young researchers, the work and organization of YERME will be presented and complemented with exchanging experiences between the participants. This session is prepared by YERME with support from the German Young Researchers Group.

Location: E: mint, Economical Building, lecture hall B

Organisers: Luis **Radford*** (Laurentian University), Fulvia **Furinghetti** (Università di Genova), Kathleen **Clark** (Florida State University)

HPM: INTERNATIONAL STUDY GROUP ON THE RELATIONS BETWEEN HISTORY AND PEDAGOGY OF MATHEMATICS

Abstract: In the first part of this presentation, we offer an overview of HPM's aims and current structure as well as some of the research lines that have been recently followed. In the second part, we present an outline of the historical roots of HPM. In the third part, we show a concrete example of HPM research inquiry.



Location: C: turquoise, Main Building, lecture hall C

Presenters: Gloria Ann **Stillman***, Jill **Brown** (Australian Catholic University), Henry **Pollak** (Teachers College Columbia University), Helena **Wessels** (Stellenbosch University)
ICTMA: INTERNATIONAL STUDY GROUP FOR MATHEMATICAL MODELLING AND APPLICATIONS

Abstract: The International Community of Teachers of Mathematical Modelling and Applications has been in existence since 1983. It meets biennially, in odd numbered years. The mission of the ICTMA is to promote Applications and Modelling in all areas of mathematics education – primary and secondary schools, colleges and universities. The academic focus encompasses themes such as the design and delivery of programs, analysis of modelling competencies and student performance, and the development and improvement of effective methods of assessment. A developing focus on research has recognised the importance of establishing a robust knowledge base from which to address problems that continue to emerge. From the outset ICTMA adopted the position that it should maintain the integrity of its focus, which is about the teaching of mathematical modelling and applications, where teaching is interpreted broadly to incorporate related educational matters such as curriculum, assessment, and evaluation. The purpose of this session is to induct those who are interested into current activities of the organisation.

Location: C: turquoise, Main Building, lecture hall J

Organisers: Eva **Norén***, Lisa Bjorklund **Boistrup*** (Stockholm University), Tamsin **Meaney** (Bergen University College), Yvette **Solomon** (Manchester Metropolitan University), Moneoang **Leshota** (National University of Lesotho)
IOWME: INTERNATIONAL ORGANIZATION OF WOMEN AND MATHEMATICS EDUCATION

Abstract: The International Organization of Women and Mathematics Education is an international network of individuals and groups who share a commitment to achieving equity in education and who are interested in the links between gender and the teaching and learning of mathematics. In our meeting at ICME 13 we will have three presentations with researchers from different parts of the world giving perspectives on women, girls and mathematics education.

Location: D: yellow, West Wing Building, room 221

Organisers: Roza **Leikin*** (University of Haifa), Linda **Sheffield** (Northern Kentucky University), Marianne **Nolte** (University of Hamburg)
MCG: INTERNATIONAL GROUP FOR MATHEMATICAL CREATIVITY AND GIFTEDNESS

Abstract: The purpose of MCG is to bring together mathematics educators, mathematicians, researchers, and others who are interested in nurturing and supporting the development of mathematical creativity and the realization of mathematical promise and mathematical giftedness, promoting the improvement of teaching and learning mathematics, and widening students' abilities to apply mathematical knowledge in innovative and creative ways. The main goals of the group are to encourage research concerning the discovery, nurture and support of mathematical creativity, giftedness, talent and promise for all students, support investigation and dissemination of information on the role of teacher knowledge and education, educational systems, and cultural aspects related to the development of mathematical creativity and promise stimulate national and international activities to further the aims of the Group. At the MCG meeting the president's report on the previous four years will be presented. The participants will be invited to discuss possible directions for the future development of the group. All the participants of the session will be encouraged to participate in a creative mathematical activity.

ICMI Affiliate Organisations

Location: E: mint, Economical Building, lecture hall A

Organisers: Tom Lowrie* (University of Canberra), Jennifer Way (University of Sydney)
MERGA: MATHEMATICS EDUCATION RESEARCH GROUP OF AUSTRALASIA

Abstract: This session showcases the journals and conferences of the Mathematics Education Research Group of Australasia (MERGA). A feature will be the book-launch of the ninth edition of the 4-yearly review of 'Research in Mathematics Education in Australasia 2012–2015' published by Springer. Delegates are invited to join us to celebrate the research achievements and dissemination activities of the Australasian mathematics education research community.

Location: C: turquoise, Main Building, lecture hall A

Presenters: Helen **Forgasz** (Monash University), Lulu **Healy** (Anhanguera University of São Paulo), Barbara **Jaworski** (Loughborough University), Peter **Liljedahl** (Simon Fraser University), Mamokgethi Setati **Phakeng** (University of Cape Town), Michal **Tabach*** (Tel-Aviv University), Wim **Van Dooren** (University of Leuven)
PME: INTERNATIONAL GROUP FOR THE PSYCHOLOGY OF MATHEMATICS EDUCATION

Abstract: The aim of the presentation is to allow researchers interested in mathematics education, who are not familiar with PME to learn about the aims, structure, and activities of the organisation. The session will also allow participants to gain a sense of the depth and breadth of research in mathematics education of interest to PME members. Each year during the PME conference, there is one plenary session consisting of a panel of researchers debating a 'hot topic' related to research in mathematics education. The panel topic is usually closely linked to the theme of the annual conference, and is led by an expert researcher in the field. In the ICME session, the focus will be on the mathematics education issues that were debated at the PME plenary panel sessions in the last four years. The speakers include the four panel leaders who will each present a short summary of the panel they convened. In addition, three PME officers – president, vice president and secretary – will communicate about PME activities more generally.

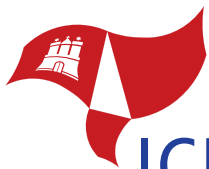
Location: C: turquoise, Main Building, lecture hall M

Organiser: Alexander **Soifer*** (University of Colorado at Colorado Springs)
WFNMC: WORLD FEDERATION OF NATIONAL MATHEMATICS COMPETITIONS

Abstract: The WFNMC Session will commence with the presentation of the four Paul Erdős Awards. Each new Laureate will be introduced by a citation of his or her achievements, followed by a presentation of the Paul Erdős Medal and the Certificate of Award. The new Paul Erdős Award Laureates expected to be present are: Petar Stoyanov Kenderov, Bulgaria; Luis Caceres, Puerto Rico; David C. Hunt, Australia; Kar-Ping Shum, Hong Kong

10





National Presentations

Time: Saturday, 30 July 2016, 16.30 – 18.00 (Parallel Presentations)

More details on the programme of each national presentation can be found in the electronic version of the programme of ICME-13.

Location: I: blue, Philosophical Tower, lecture hall B

Organisers: Esther **Galina*** (Universidad Nacional de Córdoba), Virginia **Montoro** (Universidad Nacional Del Comahue), Carmen **Sessa** (Universidad Pedagógica de Buenos Aires)

NATIONAL PRESENTATION OF ARGENTINA

The purpose of this presentation is to offer an overview of mathematics education in Argentina and the historic contributions that converge to its present. The presentation will include three principal topics: the characteristics of the actual education system and some special programme; the teacher education system and its particularities, and the development of the mathematics and the mathematics education in the country, their historical context, the actual associations and the current state of mathematics education as a research field.

Location: I: blue, Philosophical Tower, lecture hall D

Organiser: Victor **Giraldo** (Universidade Federal do Rio de Janeiro)

NATIONAL PRESENTATION OF BRAZIL: TEACHERS' PROFESSIONAL DEVELOPMENT AND MATHEMATICS EDUCATION

Brazil's National Presentation will focus on research in mathematics education in the country and its relationships with projects and initiatives for the improvement of teachers' education (especially the ones involving different communities, as mathematicians, mathematics educators and mathematics teachers) – taking into account the challenges imposed by Brazilian education scenario. The 90 minutes presentation will be accompanied by printed and interactive multimedia material exhibitions. This presentation is a joint initiative of the Brazilian Mathematical Society (SBM), the Brazilian Society of Mathematics Education (SBEM), the Brazilian Society of Applied and Computational Mathematics (SBMAC), and the Brazilian Statistics Association (ABE)

Location: I: blue, Philosophical Tower, lecture hall A

Organisers: Thérèse **Dooley** (Dublin City University), Elizabeth **Oldham** (Trinity College Dublin), Maurice **O'Reilly*** (St Patrick's College Drumcondra), Gerry **Shiel** (Educational Research Centre)

NATIONAL PRESENTATION OF IRELAND

The past decade has seen reform in policy and practice in relation to mathematics education in Ireland, reform that has enjoyed robust public discussion and debate. Reviews of the school curricula for mathematics have been undertaken, and significant curricular reform at post-primary (secondary) level has been implemented (although not without controversy). For even longer, Ireland has participated in cycles of PISA and TIMSS. Whilst these activities have been informed by international research and practice, research in mathematics education in Ireland has been driven by several initiatives, both by Government agencies and by research centres and conference series in higher education institutions. There are researchers in mathematics education in all of the Universities and in some of the Institutes of Technology. Moreover, other state agencies conduct or commission large-scale research projects. More broadly, the Teaching Council was set up in 2006 to regulate the teaching profession and promote professional standards, and can be expected to impact on teachers' professional development.

National Presentations

Location: H: orange, Educational Building, lecture hall

Organisers: Toshiakira **Fujii*** (Tokyo Gakugei University), Yoshinori **Shimizu** (University of Tsukuba), Hanako **Senuma** (Tamagawa University), Toshikazu **Ikeda** (Yokohama National University)

NATIONAL PRESENTATION OF JAPAN

There are big four organizations concerning mathematics education in Japan. This national presentation is organized by the Japan Society of Mathematical Education (JSME) with the help of other organizations. First, we describe basic facts of Japanese Mathematics education. Since the 2008 revision of the Mathematics curriculum, mathematics activities, enjoying mathematics, data analysis etc. are emphasized more in the curriculum. Textbooks are approved by the Ministry of Education, Culture, Sports, Science and Technology. Second, Japanese mathematics problems will be displayed by active demonstration of a set of interesting and unique problems such as 'Wasan: Japanese mathematics before introduction of Western Mathematics' and 'Origami: paper holding'. Furthermore, posters will be displayed. Third, National Test in Japan again started since 2007 by the effects of international mathematic studies such as IEA study TIMSS and OECD study PISA. Using the items of the National Test, the relations between knowledge and applications of Mathematics are described. Finally, the secrets of success, namely how to prepare excellent teachers of mathematics teaching as well as the method 'Lesson study' is well described.

Location: I: blue, Philosophical Tower, lecture hall C

Organisers: Fidel R. **Nemanzo** (University of the Philippines), Masami **Isoda** (University of Tsukuba, Japan), Maitree **Inprasitha***, Sampan **Thinwiangthong** (Khon Kaen University, Thailand), Chan **Roath**, Monkolsery **Lin** (Cambodian Mathematical Society), Souksomphone **Anothay**, Phoutsakhone **Changgakhom** (Savannakhet University and National University of Laos), Nguyen Chi **Thanh**, VU NHU Thu **Huong**, Phuong Thao **Nguyen** (University of Education, Vietnam)

NATIONAL PRESENTATION OF LOWER MEKONG SUB-REGION

Lower Mekong sub-region is a strategic area for new economic development of ASEAN community and mathematics is very important to support this development. Thus, the presentation aims to let the global mathematics education community recognize the development of mathematics education in this region by providing the status quo of mathematics education during the last decade. It consists of three parts: 1) An overview of mathematics education of each country in the Lower Mekong Sub-region (Cambodia, Laos, Myanmar, Vietnam and Thailand), 2) Establishment of society of mathematics education and development in each country and 3) Emergent mathematics education community in the Lower Mekong Sub-Region.

Location: I: blue, Philosophical Tower, lecture hall G

Organiser: Huriye **Arikan** (Sabanci University)

NATIONAL PRESENTATION OF TURKEY: TEACHING AND LEARNING MATHEMATICS

This presentation discusses mathematics education in Turkey from the perspective of teaching and learning. Contemporary national high school mathematics curriculum, its varied applications and factors affecting its success are presented. While a modest selection of national and international attributes of educators and agencies is provided, the presentation mainly focuses on the achievements of Turkish Mathematical Society in enhancing mathematics education and promoting public interest in the subject. A showcase narration of an innovative school, Nesin Mathematical Village, which is designed to cultivate deep mathematics appreciation among its participants, is given.

The tables of the presenting nations are in the Auditorium Maximum (Building J: red) on the second floor.

NP



European Didactic Traditions

Chair: Werner **Blum** (University of Kassel, Germany)

Team: Michèle **Artigue** (University Paris Diderot, France), Alessandra **Mariotti** (University of Siena, Italy), Rudolf **Sträßer** (JLU Giessen, Germany), Marja **Van den Heuvel-Panhuizen** (Utrecht University, Netherlands)

Panel Presentation

Time: Wednesday, 27 July 2016, 15.00 – 16.00

Location: C: turquoise, Main Building, lecture hall A

Programme:

Introduction and Overview: Werner **Blum**

- Description of the key features and the four parallel sub-strands:
- Role of Mathematics and Mathematicians: Alessandra **Mariotti**
- Role of Theory: Michèle **Artigue**
- Role of Design Activities: Marja **Van den Heuvel-Panhuizen**
- Role of Empirical Research: Rudolf **Sträßer**

Parallel Sessions

Time: Wednesday, 27 July 2016, 16.30 – 18.30

The case of France

Location: C: turquoise, Main Building, lecture hall A

Session Chair: Michèle **Artigue**

Programme:

- Luc **Trouche** (Ecole Normale Supérieure de Lyon) & Michèle **Artigue** (University Paris Diderot – Paris 7): The French didactic tradition – roots and development.
- Viviane **Durand-Guerrier** (University of Montpellier) & Aurélie **Chesnais** (University of Montpellier): Case study “Educational research on axial symmetry in the French tradition”.
- Marianna **Bosch** (University Ramon Llull – Spain): Case study “Research on school algebra in the French tradition”.
- Christine **Knipping** (Universität Bremen – Germany) as a critical friend: View of the French tradition, especially through the lens of validation and proof.
- Michela **Maschietto** (University of Modena e Reggio Emilia – Italy): Didactic interactions between France and Italy – a personal journey.
- Faïza **Chellougui** (University of Carthage – Tunisia): Didactic interactions between France and African countries – the case of Tunisia.
- Avenilde **Romo Vazquez** (Instituto Politécnico Nacional – Mexico): Didactic interactions between France and Latin-America – the case of Mexico.

Thematic Afternoon

The case of Germany

Location: C: turquoise, Main Building, lecture hall C

Session Chair: Rudolf **Sträßer**

Programme:

- Historical account of major developments in the roles of mathematics and mathematicians, of design of learning and teaching environments and of empirical research in Germany (interviews with Lisa **Hefendehl-Hebeker**, Hans-Georg **Weigand** and Erich C. **Wittmann**).
- Examples of recent German research: Stephan **Hußmann** on “Design of learning environments – expanding and enhancing subject matter didactics, Kerstin **Tiedeman** (University of Cologne) on “Helping primary students to learn maths – language and interaction”, Stefan **Krauss** on “COACTIV – the impact of professional knowledge on student achievement”.
- Barbro **Grevholm** (University of Agder – Norway), Edyta **Nowinski** (University of Osnabrück – Germany) and Nada **Vondrová** (Charles University – Czech Republic) as critical friends.

The case of Italy

Location: C: turquoise, Main Building, lecture hall J

Session Chair: Maria Alessandra **Mariotti**

Programme:

- Maria Alessandra **Mariotti** (University of Siena – Italy): Emergence and evolution of the Italian didactic tradition
- Paolo **Boero** (Università di Genova) & Mariolina **Bartolini-Bussi** (UNIMORE – Italy): Some features of the Italian situation, with a specific focus on the challenges of teacher education in a multicultural context.
- Nadia **Dueck** (Université de Nice – France) as critical friend: Report on experiences of collaborations and cooperation between France and Italy, in particular SFIDA.
- Xuhua **Sun** (University of Macau – Macau/China): View on the Italian tradition of mathematics education from a Chinese culture perspective.

The case of Netherlands

Location: C: turquoise, Main Building, lecture hall B

Session Chair: Marja **Van den Heuvel-Panhuizen**

Programme:

- Mathematics and mathematics education in the Netherlands (two videos).
- Paul **Drijvers**: “Driving to Hamburg” (activity for the audience and experiences from classroom).
- Marc **van Zanten** and Michiel **Doorman**: Video interviews with Adri **Treffers** and Jan **de Lange**.
- Marja **van den Heuvel-Panhuizen**: RME within the Dutch tradition.
- David **Webb** (USA), Harun **Zulkardi** and Ratu Ilma Indra **Putri** (Indonesia), and Sue **Hough** (England): Examples of interactions between the Dutch tradition and other countries.
- Cyril **Julie** (South Africa) and Dirk **De Bock** (Belgium) as critical friends: Comments on the Dutch tradition.
- Various interactions with the audience.

TA





German-speaking Traditions in Mathematics Education Research

Chair: Hans Niels **Jahnke**

Team: Rolf **Biehler** (Universität Paderborn), Angelika **Bikner-Ahsbahs** (Universität Bremen), Uwe **Gellert** (Freie Universität Berlin), Gilbert **Greefrath** (University of Münster), Lisa **Hefendehl-Hebeker** (Universität Duisburg-Essen), Hans Niels **Jahnke** (Universität Duisburg-Essen), Götz **Krummheuer** (Goethe University Frankfurt), Timo **Leuders** (University of Education Freiburg), Marcus **Nührenbörger** (Technische Universität Dortmund), Andreas **Obersteiner** (University of Education Freiburg), Kristina **Reiss** (TUM School of Education), Bettina **Rösken-Winter** (Humboldt-Universität zu Berlin), Andreas **Schulz** (University of Education Freiburg), Andreas **Vohns** (Alpen-Adria-Universität Klagenfurt), Rudolf **vom Hofe** (Universität Bielefeld), Kathrin **Vorhölter** (University of Hamburg)

Panel Presentation

Time: Wednesday, 27 July 2016, 15.00 – 16.00

Location: J: red, Auditorium Maximum, lecture hall

Programme:

Introduction and Overview: Hans Niels **Jahnke**

Description of the eight sub-strands:

- Subject-matter didactics (German 'Stoffdidaktik'): Lisa **Hefendehl-Hebeker**, Rudolf **vom Hofe**
- Design science: Marcus **Nührenbörger**, Bettina **Rösken-Winter**
- Modelling: Gilbert **Greefrath**, Kathrin **Vorhölter**
- Allgemeinbildung and Mathematical Literacy: Rolf **Biehler**, Hans Niels **Jahnke**
- Theory traditions in German speaking countries: Angelika **Bikner-Ahsbahs**, Andreas **Vohns**
- Classroom Studies: Uwe **Gellert**, Götz **Krummheuer**
- Educational Research on Learning and Teaching of Mathematics: Timo **Leuders**, Andreas **Schulz**
- Large-Scale Studies: Andreas **Obersteiner**, Kristina **Reiss**

Parallel Sessions

Time: Wednesday, 27 July 2016, 16.30 – 18.30

Allgemeinbildung and Mathematical Literacy

Location: I: blue, Philosophical Tower, lecture hall A

Session Chairs: Rolf **Biehler** & Hans Niels **Jahnke**

Programme:

- Hans Niels **Jahnke**: Mathematics and "Allgemeinbildung" at the Times of W. v. Humboldt
- Michael F. **Fried** (Ben Gurion University of the Negev, Israel): International Reaction
- Rolf **Biehler**: "Allgemeinbildung", Mathematical Literacy, and Competence Orientation
- Mogens **Niss** (Roskilde University, Denmark): International Reaction

Thematic Afternoon

Classroom Studies

Location: I: blue, Philosophical Tower, lecture hall F

Session Chairs: Uwe **Gellert** & Götz **Krummheuer**

Programme:

- Götz **Krummheuer**: Interpretive Classroom Research – Origins, Insights, Developments
- Núria **Planas** (University Autonomous of Barcelona, Spain) & Michelle Stephan (UNC Charlotte, USA): Two International Commentaries
- Uwe **Gellert**: Classroom Research as Part of the Socio-Political Agenda
- Eva **Jablonka** (King's College London, UK): International Commentary

Design science

Location: I: blue, Philosophical Tower, lecture hall D

Session Chairs: Marcus **Nührenbörger** & Bettina **Roesken-Winter**

Programme:

- Marcus **Nührenbörger** & Bettina **Rösken-Winter**: Mathematics education as a 'design science': Where did we start?
- Susanne **Prediger** (TU Dortmund, Germany) and Paul **Cobb** (Vanderbilt University, USA): Trends and developments
 - German Trends on Design Science
 - Design Research at the System Level
 - Discussion
- Michael **Link** (Ph St.Gallen, Switzerland), Ralph **Schwarzkopf** (Carl von Ossietzky Universität, Germany), Anna S. **Steinweg** (University of Bamberg, Germany) and Chun Ip **Fung** (Hong Kong Institute of Education, Hong Kong / China): Designing and researching substantial learning environments: Four examples of design experiments
- Erich Ch. **Wittmann** (Technical University of Dortmund, Germany): Design science revisited: Where are we now?

Educational Research on Learning and Teaching of Mathematics

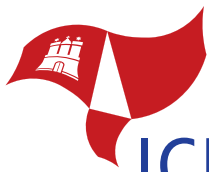
Location: I: blue, Philosophical Tower, lecture hall G

Session Chairs: Timo **Leuders** & Andreas **Schulz**

Programme:

- Timo **Leuders**: Interdisciplinary research projects
 - Teaching self-regulation and problem solving (Regina **Bruder** – Video interview)
 - Teaching proof with heuristic worked examples (Alexander **Renkl** – Video interview)
- Andreas **Schulz**: Flexible mixed-methods approaches
 - Language and mathematics: From qualitative interviews to test development (Susanne **Prediger** – Video interview)
 - Mathematical cognition: Epistemology, Grounded theory and teaching experiment (Kathleen **Philipp** – Video interview)
- Kaye **Stacey** (University of Melbourne, Australia): International Commentary

TA



Large-Scale Studies

Location: I: blue, Philosophical Tower, lecture hall B

Session Chairs: Andreas **Obersteiner** & Kristina **Reiss**

Programme:

- Kristina **Reiss**: Competency Modelling – Overview and Recent Developments
- Aiso **Heinze**: Large Scale Assessment – Impact on Mathematics Education Research and Practice in Germany
- Ursula **Itzlinger-Bruneforth** (BIFIE, Austria): Competency Models and Large-Scale Assessments in Austria
- Fou-Lai **Lin** (National Taiwan Normal University, Taiwan): Discussion From an International Perspective

Modelling

Location: I: blue, Philosophical Tower, lecture hall C

Session Chairs: Gilbert **Greefrath** & Katrin **Vorhölter**

Programme:

- Gilbert **Greefrath**: Mathematical Modelling in German speaking countries: Introduction and Overview
- Rita Borromeo **Ferri** (University of Kassel, Germany), Dominik **Leiß** (Leuphana University of Lüneburg, Germany) & Stanislaw **Schukajlow** (University of Muenster, Germany): Cognitive and empirical approaches
 - Classification of Modelling Cycles – a view insight cognitive processes
 - Quantitative Research on Modelling – Examples from German Speaking Countries
- Katrin **Vorhölter** & Katja **Maaß** (University of Education Freiburg, Germany): Promoting modelling competencies
 - Implementing mathematical modelling in schools
 - Mathematical Modelling in professional development – traditions in Germany
- Gloria **Stillman** (Australian Catholic University, Australia) and Katrin **Vorhölter**: International Perspective on the German modelling debate, Discussion

Subject-matter didactics

Location: J: red, Auditorium Maximum, lecture hall

Session Chairs: Lisa **Hefendehl-Hebeker** & Rudolf **vom Hofe**

Programme:

- Lisa **Hefendehl-Hebeker** & Rudolf **vom Hofe**: Subject matter didactics: Overview of origin, main issues, theory, methods, and fields of application
- Sebastian **Wartha** (University of Education Karlsruhe, Germany) and Axel **Schulz** (Bielefeld University, Germany): Basic ideas (Grundvorstellungen) of natural numbers and fractions
- Hans **Humenberger** (Universität Wien, Austria) and Andreas **Büchter** (University of Duisburg-Essen, Germany): Clarity and strictness in calculus courses

Thematic Afternoon

Theory traditions in German speaking countries

Location: I: blue, Philosophical Tower, lecture hall E

Session Chairs: Angelika **Bikner-Ahsbahr** & Andreas **Vohns**

Programme:

- Angelika **Bikner-Ahsbahr** & Andreas **Vohns**: Hans-Georg Steiner – Theories in / of Mathematics Education (TME) as a scientific discipline
- Regina **Bruder** (TU Darmstadt, Germany): Joachim **Lompscher** – his activity theory approach and its influence on contemporary research in German-speaking countries
- Willi **Dörfler** (Universität Klagenfurt, Austria): Peirce and Wittgenstein – signs and their use
- Angelika **Bikner-Ahsbahr**: Networking of Theories in the tradition of TME?
- Andreas **Vohns** & Angelika **Bikner-Ahsbahr**: Looking ahead

TA





Legacy of Felix Klein

Chair: Hans-Georg **Weigand** (University of Würzburg, Germany)

Team: William **McCallum** (University of Arizona, USA), Marta **Menghini** (Sapienza University of Rome, Italy), Michael **Neubrand** (University of Oldenburg, Germany), Gert **Schubring** (Universidade Federal do Rio de Janeiro, Brazil & Universität Bielefeld, Germany)

Panel Presentation

Time: Wednesday, 27 July 2016, 15.00 – 16.00

Location: H: orange, Educational Building, lecture hall

Video Transmission 1: Law Building, lecture hall,

Video Transmission 2: Social Science Building, lecture hall

Programme:

Hans-Georg **Weigand**: Introduction: What is and what could be the legacy of Felix Klein?

Renate **Tobies** (University of Jena): Biographical notes on Felix Klein

Introduction into the planned content of the different strands:

- William **McCallum**: Strand A – Functional thinking
- Michael **Neubrand**: Strand B – Intuitive thinking and visualization
- Marta **Menghini** & Gert **Schubring**: Strand C – Elementary mathematics from a higher standpoint

Parallel Sessions

Time: Wednesday, 27 July 2016, 16.30 – 18.30

Strand A: Functional Thinking

Location: H: orange, Educational Building, lecture hall

Session Chair: William **McCallum**

Programme:

- Katja **Krüger** (University of Paderborn, Germany): Functional Thinking – about the history of a didactical principle
- Hyman **Bass** (University of Michigan, USA): The K-12 Number Line: Is it built, or occupied?
- Pat **Thompson** (Arizona State University, USA): USA and South Korean teachers' meanings for function and function notation as a potential source of differences in students' learning

Strand B: Intuitive thinking and visualization

Location: K: purple, Law Building, lecture hall

Session Chair: Michael **Neubrand**

Programme:

Klein's ideas on promoting visual thinking

- Martin **Mattheis** (Johannes Gutenberg Universität Mainz, Germany): Aspects of "Anschauung" in the work of Felix Klein
- Stefan **Halverscheid** (Georg-August-Universität, Germany) and Oliver Labs (Johannes Gutenberg Universität Mainz, Germany): Felix Klein's mathematical heritage seen through 3D-models and other tools of visualization

The impact of Klein's ideas on visualization and intuition into modern teaching mathematics

- Flavia **Mammanna** (University of Catania, Italy): The modernity of the Meraner Lehrplan for teaching geometry
- Chris **Rasmussen** (San Diego State University, USA): Visualization and Intuition in Linear Algebra
- Ysette **Weiss-Pidstrygach** (Johannes Gutenberg – Universität Mainz, Germany): Grasping Mathematics: Using Treutlein's Classroom Models in Teacher Education
- Sebastian **Kitz** (Bergische Universität Wuppertal, Germany): Animated mathematical films as teaching material

Strand C: Elementary Mathematics from a higher standpoint

Location: G: green, Social Science Building, lecture hall

Session Chair: Marta **Menghini**, Gert **Schubring**

Programme:

- The content of the three volumes on "Elementary Mathematics from a higher Standpoint"
- Gert **Schubring**: Klein's conception of 'Elementary Mathematics from a higher Standpoint'
- Marta **Menghini**: Examples from Volume III of Klein's conception
- Henrike **Allmendinger** (Fachhochschule Nordwestschweiz Basel, Switzerland): Examples of Klein's practice
- Jeremy **Kilpatrick** (University of Georgia, USA): Comments on the previous part and introduction to the second part
- The impact on teacher education
 - Frédéric **Gourdeau** (Université Laval, Canada): Disciplinary mathematics and school mathematics for teacher education today
 - Masami **Isoda** (University of Tsukuba, Japan): Impact of Klein's work for teacher education today – Asia
 - Katalin **Gosztanyi** (University of Szeged, Hungary and University Paris Diderot, France): Impact of Klein's work for teacher education today – Eastern Europe



Topic Study Groups

TSG

TSG 1 – Early childhood mathematics education (up to age 7)

Co-chairs: Elia **Iliada** (Cyprus), Joanne **Mulligan** (Australia)

Team members: Ann **Anderson** (Canada), Anna **Baccaglioni Frank** (Italy), Christiane **Benz** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3034

Session Chairs: Joanne **Mulligan**, Iliada **Elia**

Presentations: Nathalie **Sinclair***

(Simon Fraser University)

TIME, IMMERSION AND ARTICULATION: DIGITAL TECHNOLOGY FOR EARLY CHILDHOOD MATHEMATICS

Iliada **Elia***, Kyriakoulla **Evangelou**, Athanasios **Gagatsis**

(University of Cyprus)

GESTURES AND THEIR INTERRELATIONS WITH OTHER SEMIOTIC RESOURCES IN THE LEARNING OF GEOMETRICAL CONCEPTS IN KINDERGARTEN

Jennifer S. **Thom***

(UVic)

CIRCLING THREE CHILDREN'S SPATIAL-GEOMETRIC REASONINGS

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3034

Session Chairs: Anna Ethelwyn **Baccaglioni-Frank**, Ann **Anderson**

Presentations: Gina **Bojorque*** (1,2), Joke **Torbeyns** (1), Minna **Hannula-Sormunen** (3),

Daniël **Van Nijlen** (1), Lieven **Verschaffel** (1)

(1: KU Leuven; 2: University of Cuenca; 3: University of Turku)

ECUADORIAN KINDERGARTNERS' SFON DEVELOPMENT

Sanne **Rathé***, Joke **Torbeyns**, Bert **De Smedt**, Lieven **Verschaffel**

(KU Leuven)

KINDERGARTNERS' SPONTANEOUS FOCUS ON NUMBER DURING PICTURE BOOK READING

Christiane **Benz*** (1), Jill **Cheeseman** (2), Yianna **Pullen** (3)

(1: University of Education Karlsruhe; 2: Monash University Melbourne; 3: Leibler Yavneh College)

MEASUREMENT MAKES NUMBERS SENSIBLE

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3034

Session Chairs: Christiane **Benz**, Ann **Anderson**

Presentations: Joanne **Mulligan*** (Macquarie University Sydney)

PROMOTING EARLY MATHEMATICAL STRUCTURAL DEVELOPMENT THROUGH AN INTEGRATED ASSESSMENT AND PEDAGOGICAL PROGRAM

Topic Study Groups

TSG

Miriam M. **Lüken*** (Universität Bielefeld)
REPEATING PATTERNING COMPETENCIES IN 3- AND 4-YEAR OLD KINDERGARTNERS

Ralf **Kampmann***, Miriam M. **Lüken** (Universität Bielefeld Fak. Mathematik IDM)
THE INFLUENCE OF FOSTERING CHILDREN'S PATTERN AND STRUCTURE ABILITIES
ON THEIR ARITHMETIC SKILLS IN GRADE 1

Pessia **Tsamir**, Dina **Tirosh**, Esther **Levenson**, Ruthi **Barkai***, Michal **Tabach**
(Tel Aviv University)
PRESCHOOL TEACHERS' RESPONSES TO REPEATING PATTERNS TASKS

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3034

Session Chairs: Joanne **Mulligan**, Iliada **Elia**

Presentations: Ann **Anderson***, Jim **Anderson**
(University of British Columbia)
A STUDY OF TYPES OF MATH-IN-CONTEXT THAT PARENTS AND PRESCHOOLERS
SHARE AT HOME

Herbert **Ginsburg***
(Teachers College Columbia University)
INTERACTIVE MATHEMATICS BOOKS AND THEIR FRIENDS

Anna Ethelwyn **Baccaglini-Frank***
("Sapienza" University of Rome)
EDUCATIONAL MULTI-TOUCH APPLICATIONS, NUMBER SENSE, AND THE
HOMOGENIZING ROLE OF THE EDUCATOR

TSG 2 – Mathematics education at tertiary level

Co-chairs: Victor **Giraldo** (Brazil), Chris **Rasmussen** (USA)
Team members: Irene **Biza** (UK), Reinhard **Hochmuth** (Germany), Azimeh **Khakbaz** (Iran)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 221

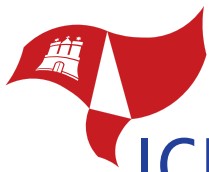
Session Chair: Chris **Rasmussen**

Presentations: Megan **Wawro*** (1), Michelle **Zandieh** (2), Chris **Rasmussen** (3)
(1: Virginia Tech; 2: Arizona State University; 3: San Diego State University)
SYMBOLIZING AND BROKERING IN FOSTERING INQUIRY

Valeria Aguirre **Holguín***
(Universidad Autónoma de Ciudad Juárez)
UNIVERSITY STUDENTS' BEHAVIOR WORKING WITH NEWLY INTRODUCED
MATHEMATICAL DEFINITIONS

Dmitri **Nedrenco***
(Julius-Maximilians-Universität Würzburg)
LEARNING HOW TO AXIOMATISE THROUGH PAPER FOLDING





Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 221

Session Chair: Victor **Giraldo**

Presentations: Elena **Nardi*** (University of East Anglia)

TEACHING MATHEMATICS TO NON-MATHEMATICIANS: WHAT CAN WE LEARN FROM RESEARCH ON TEACHING MATHEMATICIANS?

Alon **Pinto***

(University of California)

UNIVERSITY MATHEMATICS LECTURES: TEACHING THE SAME TOPICS BUT DIFFERENT MATHEMATICS

Annie **Selden***, John **Selden**

(New Mexico State University)

USING A THEORETICAL PERSPECTIVE TO TEACH A PROVING SUPPLEMENT FOR AN UNDERGRADUATE REAL ANALYSIS COURSE

Jayaluxmi **Naidoo***

(University of KwaZulu-Natal)

EXPLORING LECTURERS' PERCEPTIONS OF USING TECHNOLOGY TO TEACH MATHEMATICS AT TERTIARY LEVEL

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 221

Session Chair: Azimehsadat **Khakbaz**

Presentations: Greg **Oates***, Tanya **Evans**

(University of Auckland)

MATHEMATICIANS AND MATHEMATICS EDUCATION: COLLABORATING FOR PROFESSIONAL DEVELOPMENT

Pee Choon **Toh***, Weng Kin **Ho**, Kok Ming **Teo**, Khiok Seng **Quek**, Tin Lam **Toh**, Eng Guan **Tay**, Romina Ann S. **Yap**

(National Institute of Education)

HOLISTIC APPROACH TO CURRICULUM REVIEW OF UNDERGRADUATE MATHEMATICS

Ann **O'Shea*** (1), Sinead **Breen** (2), Conor **Brennan** (3), Frank **Doheny** (4), Fiona **Lawless** (5),

Christine **Kelly** (1), Ciaran Mac **an Bhaird** (1), Seamus **McLoone** (1), Eabhnat **Ni Fhloinn** (3),

Caitriona **Ni She** (1,3), Brien **Nolan** (3)

(1: Maynooth University; 2: St Patrick's College; 3: Dublin City University; 4: Athlone Institute of Technology;

5: Dundalk Institute of Technology)

USING TECHNOLOGY TO DEVELOP FORMATIVE ASSESSMENT RESOURCES FOR FIRST YEAR UNDERGRADUATE MODULES

Christer **Bergsten*** (1), Eva **Jablonka** (2), Hoda **Ashjari** (1)

(1: Linköping University; 2: King's College London)

THE TRANSITION FROM SECONDARY TO TERTIARY MATHEMATICS EDUCATION – A SWEDISH STUDY

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 221

Session Chair: Irene **Biza**

Presentations: Melih **Turgut*** (1), Paul **Drijvers** (2)

(1: Faculty of Education; 2: Freudenthal Institute)

STUDENTS' THINKING MODES AND THE EMERGENCE OF SIGNS IN LEARNING
LINEAR ALGEBRA

Igor' **Kontorovich***

(The University of Auckland)

EXPLORING STUDENTS' INTERACTIONS IN AN ONLINE FORUM THAT ACCOMPANIED
A COURSE IN LINEAR ALGEBRA

Kathrin **Nagel***, Kristina **Reiss**

(TUM School of Education)

MATHEMATICAL ARGUMENTATION OF FIRST-YEAR STUDENTS: THE INFLUENCE
OF CONCEPTUAL KNOWLEDGE

TSG 3 – Mathematics education in and for work

Co-chairs: Geoff **Wake** (UK), Diana **Coben** (New Zealand)

Team members: Burkhard **Alpers** (Germany), Keith **Weeks** (UK), Peter **Frejd** (Sweden)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2175/2181

Session Chair: Burkhard **Alpers**

Presentations: Diana **Coben*** (1), Keith **Weeks** (2)

1: New Zealand; 2: University of South Wales

(1: University of Waikato; 2: University of South Wales)

AUTHENTICITY IN VOCATIONAL MATHEMATICS: SUPPORTING MEDICATION DOSAGE
CALCULATION PROBLEM SOLVING IN NURSING

Vincent **Jonker**, Wijers **Monica**, Mooldijk **Ad**, Abels **Mieke**, Michiel **Doorman***

(Utrecht University)

REDESIGN GUIDELINES TO ENRICH CLASSROOM TASKS FOR MATHS AND SCIENCE

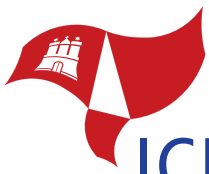
Kees **Hoogland*** (1), Birgit **Pepin** (2)

(1: SLO – Netherlands Institute for Curriculum Development; 2: Eindhoven School of Education;

2: Eindhoven School of Education)

THE NUMERACY OF VOCATIONAL STUDENTS: EXPLORING THE NATURE OF THE
MATHEMATICS USED IN DAILY LIFE AND WORK





Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2175/2181

Session Chair: Keith **Weeks**

Presentations: John J. **Keogh***, Theresa **Maguire**
(Institute of Technology Tallaght Dublin)

RE-CONTEXTUALISING MATHEMATICS FOR THE WORKPLACE

Lisa Bjorklund **Boistrup***
(Stockholm University)

MATHEMATICS IN THE WORKPLACE FROM DIFFERENT PERSPECTIVES:
THE CASE OF ANITA, A NURSING AIDE

David **Pontin***
(University of South Wales)

VOCATIONAL MATHEMATICS & NURSING: SOCIAL MESSINESS & COMPLEXITY

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2175/2181

Session Chair: Peter **Frejd**

Presentations: Phil **Kane***
(The University of Auckland)

UNCOVERING ESTIMATION AND SPATIAL AWARENESS AS ELEMENTS
OF WORKPLACE NUMERACY

Karen **Reitz-Koncebovski***, Katja **Maaß**
(University of Education Freiburg)

DIALOGUE BETWEEN SCHOOL AND THE WORLD OF WORK IN TEACHER
PROFESSIONAL DEVELOPMENT (PD)

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2175/2181

Session Chairs: Geoff **Wake**, Diana Cicely **Coben**

Presentations: Nathalie **van der Wal***, Arthur **Bakker**, Paul **Drijvers**
(Utrecht University)

TECHNO-MATHEMATICAL LITERACIES IN THE WORKPLACES OF ENGINEERS

Damon Rodger **Whitten***
(The University of Waikato)

INSIDE A MATHEMATICS-FOR-WORK LESSON ON RATIO

TSG 4 – Activities for, and research on, mathematically gifted students

Co-chairs: Florence Mihaela **Singer** (Romania), Linda **Sheffield** (USA)

Team members: Matthias **Brandl** (Germany), Viktor **Freiman** (Canada), Kyoko **Kakihana** (Japan)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2067/71

Session Chair: Matthias **Brandl**

Presentations: Florence Mihaela **Singer*** (1), Cristian **Voica** (2), Ildiko **Pelczer** (3)

(1: UPG University of Ploiesti; 2: University of Bucharest; 3: Concordia University)

DISTINGUISHING BETWEEN GIFTED AND HIGH ACHIEVERS AT UNIVERSITY LEVEL

Carmel **Diezmann***

(Australian Catholic University)

CHARACTERISTICS OF MATHEMATICAL GIFTEDNESS: LEARNING FROM EXTRAORDINARY MINDS

Daniela **Assmus***

(University of Halle-Wittenberg)

CHARACTERISTICS OF MATHEMATICAL GIFTEDNESS IN EARLY PRIMARY SCHOOL AGE

Elena **Klimova***

(University of Education Schwaebisch Gmuend)

BASIC PSYCHOLOGICAL NEEDS AND THE DEVELOPMENT OF INTEREST IN MATHEMATICS DURING A LEARNING ACTIVITY

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2067/71

Session Chair: Florence Mihaela **Singer**

Presentations: Michael **Mhlolo***

(Central University of Technology)

USING DISCOURSE THEORY TO ANALYZE MATHEMATICAL GIFTEDNESS WITHIN THE SOUTH AFRICAN EDUCATION SYSTEM

Clara **Benedicto***, Eva **Arbona**, Adela **Jaime**, Angel **Gutierrez**

(University of Valencia)

ANALYSIS OF THE COGNITIVE DEMAND OF A GIFTED STUDENT'S STRATEGIES TO SOLVE GEOMETRIC PATTERNS PROBLEMS

Andreas **Poulos***

(Greek Ministry of Education)

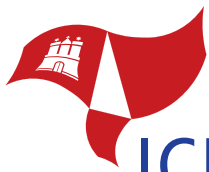
MATHEMATICAL PROBLEM SOLVING TECHNIQUES EMPLOYED BY GIFTED STUDENTS

Ingrida **Veilande*** (1), Liga **Ramana** (2), Sandra **Krauze** (3)

(1: Latvian Maritime Academy; 2: Riga Technical University; 3: Valmiera State Gymnasium)

PATHWAYS AND DEAD ENDS IN THE KINGDOM OF NUMBERS: PROBLEM SOLVING STRATEGIES USED BY STUDENTS IN MATHEMATICAL OLYMPIAD





Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2067/71

Session Chair: Linda **Sheffield**

Presentations: Ban Har **Yeap***

(Marshall Cavendish Institute & Pathlight School)

IINSTRUCTIONAL MODELS AND PEDAGOGICAL TOOLS TO ENCOURAGE AND PROMOTE MATHEMATICAL TALENTS

Stephanie **Schiemann***

(Freie Universität Berlin)

FOSTERING TALENT IN MATHEMATICS – A GERMAN PERSPECTIVE

Jeffrey J. **Wanko***

(Miami University)

DEVELOPING DEDUCTIVE AND SPATIAL REASONING WITH LANGUAGE-INDEPENDENT LOGIC PUZZLES

Michael **de Villiers***

(University of KwaZulu-Natal)

ENRICHMENT FOR THE GIFTED: GENERALIZING SOME GEOMETRICAL THEOREMS & OBJECTS

Ebrahim **Talae*** (1), Zahra **Rahimi** (2)

(1: Tarbiat Modarres University; 2: Tarbiat Modarres University)

LOOKING AT STUDENTS WHO DO GRADE SKIPPING FROM THE VIEWPOINT OF MATHEMATICAL REASONING

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2067/71

Session Chair: Viktor **Freiman**

Presentations: Roza **Leikin***

(University of Haifa)

GIFTED STUDENT'S EXPECTATIONS AND TEACHERS' CONCEPTIONS OF EFFECTIVE MATHEMATICS TEACHING

Elisabet **Mellroth*** (1), Ralf **Benölken** (2)

(1: Karlstad University; 2: University of Münster)

A CROSS COUNTRY COMPARISON OF PROFESSIONAL DEVELOPMENT PROGRAMS ON MATHEMATICAL PROMISE AND TALENT

Aidan **Fitzsimons***, Eabhnat **Ni Fhloinn**

(Dublin City University)

EXAMINING IRELAND'S NEW SECOND-LEVEL MATHEMATICS SYLLABUS AND HOW IT CATERS FOR THE HIGH ACHIEVER

Hiroko Kawaguchi **Warshauer***, Max Leon **Warshauer**, Christina **Starkey**, Terence **McCabe**,

Christina **Zunker**

(Texas State University)

ADDRESSING THE NEEDS OF GIFTED STUDENTS: OPPORTUNITIES FOR STUDENTS, TEACHERS AND RESEARCHERS

Topic Study Groups

TSG

TSG 5 – Activities for, and research on, students with special needs

Co-chairs: Lourdes **Figueiras** (Spain), Rose **Griffiths** (UK)

Team members: Karen **Karp** (USA), Jens Holger **Lorenz** (Germany), Miriam Godoy **Penteado** (Brazil)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall E

Session Chairs: Lourdes **Figueiras**, Miriam Godoy **Penteado**

Presentations: Laura **Korten***

(TU Dortmund)

MUTUAL LEARNING IN AN INCLUSIVE MATHEMATICS CLASSROOM

Solange Hassan Ali Ahmad **Fernandes**, Lulu **Healy***

(Universidade Anhanguera de São Paulo)

THE CHALLENGE OF CONSTRUCTING AN INCLUSIVE SCHOOL MATHEMATICS

Nancy C. **Jordan*** (1), Ilyse **Resnick** (1), Jessica **Carrique** (1), Nicole **Hansen** (2)

(1: University of Delaware; 2: Fairleigh Dickinson University)

THE DELAWARE LONGITUDINAL STUDY OF FRACTION LEARNING:
IMPLICATIONS FOR STUDENTS WITH MATHEMATICS LEARNING DIFFICULTIES

Barbara Anne **Clarke*** (1), Rhonda **Faragher** (2)

(1: Monash University; 2: Australian Catholic University)

INCLUSIVE PRACTICES IN THE TEACHING OF MATHEMATICS: EARLY FINDINGS
FROM RESEARCH INCLUDING CHILDREN WITH DOWN SYNDROM

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall E

Session Chairs: Lourdes **Figueiras**, Jens Holger **Lorenz**

Presentations: Rose **Griffiths***

(University of Leicester)

WORKING WITH CHILDREN IN PUBLIC CARE WHO HAVE DIFFICULTIES IN
MATHEMATICS: THE EXAMPLE OF KYLE

Michael **von Aster***

(DRK Kliniken Berlin Westend)

THE CALCULARIS LEARNING SYSTEM: ENHANCING INDIVIDUAL ADAPTIVITY
FOR AN INCLUSIVE TEACHING ENVIRONMENT

Russell **Gersten***

(Instructional Research Group)

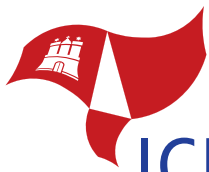
RESPONSE TO INTERVENTION IN MATHEMATICS: RESEARCH ON EARLY PREVENTION
OF MATHEMATICAL LEARNING DISABILITIES

Yan Ping **Xin*** (1), Xuan **Yang** (1), Ron **Tzur** (2), Xiaojun **Ma** (1), Joo Young **Park** (1)

(1: Purdue University; 2: University of Colorado Denver)

PGBM-COMPS MATH PROBLEM-SOLVING PROGRAM: PROMOTE INDEPENDENT
PROBLEM SOLVING OF STUDENTS WITH LD





TSG

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall E

Session Chairs: Karen **Karp**, Rose **Griffiths**

Presentations: Nicky **Roberts***

(University of Witwatersrand)

STORY-TELLING TASKS ON ADDITIVE RELATIONS WORD PROBLEMS: THE CASE OF MPHO

Mina **Sedaghatjou*** (1), Farzad **Kooshyar** (2), Stephen R. **Campbell** (3)

(1: Douglas College; 2: Simon Fraser University; 2: Simon Fraser University; 3: Simon Fraser University)

A NOVEL APPROACH ON ENABLING ADVANCED MATHEMATICAL COMMUNICATION
IN ABSENCE OF SIGHT

Rossi **DSouza***

(Homi Bhabha Centre for Science Education – TIFR)

CHALLENGING ABLEISM BY TEACHING PROCESSES RATHER THAN CONCEPTS

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall E

Session Chairs: Lourdes **Figueiras**, Jens Holger **Lorenz**

Presentations: Lucie **DeBlois***

(Université Laval)

BEHAVIOURAL DIFFICULTIES COULD COME FROM LEARNING DIFFICULTIES:
WHY AND HOW INTERVENE IN MATH CLASS

Vera Lúcia **Capellini***

(Sao Paulo State University)

COLLABORATION BETWEEN SPECIAL AND COMMON EDUCATION FOR INCLUSIVE
MATHEMATICAL EDUCATION IN BRAZIL

Susan **Gerofsky***

(University of British Columbia)

EMBODIED MULTIMODAL MATHEMATICS & A RECONCEPTUALIZATION OF SENSORY
IMPAIRMENTS

TSG 6 – Adult learning of mathematics – lifelong learning

Co-chairs: Jürgen **Maaß** (Austria), Pradeep Kumar **Misra** (India)

Team members: Terry **Maguire** (Ireland), Katherine **Safford-Ramus** (USA),

Wolfgang **Schlöglmann** (Austria), Evelyn **Süss-Stepancik** (Austria)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 4045/46

Session Chairs: Katherine **Safford-Ramus**, Wolfgang **Schlöglmann**

Presentations: John **O'Donoghue***

(University of Limerick)

MATHEMATICS EDUCATION AND ADULT LEARNERS IN IRELAND

Aoife **Smith*** (1), Niamh **O'Meara** (1), Terry **Maguire** (2)
(1: University of Limerick; 2: National Forum for Teaching and Learning)

AN INVESTIGATION INTO THE CONCEPT OF MATHS EYES WITH A PARTICULAR FOCUS ON THE MATHS EYES POSTER COMPETITION

Wolfram **Meyerhöfer***
(Universität Paderborn)

ADULTS LEARN HOW TO CALCULATE. A CURRICULUM

Eun Young **Cho***, Rae Young **Kim**
(Ewha Womans University)

LIFELONG LEARNING OF MATHEMATICS IN KOREA

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 4045/46

Session Chairs: Terry **Maguire**, Jürgen **Maaß**

Presentations: Katherine **Safford-Ramus***
(Saint Peter's University)

LEARNING FROM RESEARCH, ADVANCING THE FIELD

David **Kaye***

(Adults Learning Mathematics)

DEFINING ADULT NUMERACY AND MATHEMATICS – AN ACADEMIC AND POLITICAL INVESTIGATION

Pradeep Kumar **Misra***
(CCS University)

OPEN EDUCATIONAL RESOURCES: A POTENTIAL TOOL FOR ADULT LEARNERS, TO ACHIEVE LIFELONG LEARNING OF MATHEMATICS

Maria Elizabete Souza **Couto***, Neomar Lacerda Silva **Silva**
(Universidade Estadual de Santa Cruz)

THE MATHEMATICS IN THE YOUNG PEOPLE AND ADULT EDUCATION: THE PRACTICE IN CONSTRUCTION

Alper Cihan **Konyalio lu** (1), Zekiye **Morkoyunlu*** (2), Solmaz Damla **Gedik** (3)

(1: Atatürk University; 2: Ahi Evran University; 3: Hacı Bekta Veli University)

PARENTS' TRAINING IN MATHEMATICS: A SOCIATEL AWARENESS STUDY

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 4045/46

Session Chairs: Jürgen **Maaß**, Pradeep Kumar **Misra**

Presentations: Terry **Maguire***, Aoife M. **Smith**

(The National Forum for the Enhancement of Teaching and Learning in Higher Education)

MATHS EYES-A CONCEPT WITH POTENTIAL

Sonja **Beeli-Zimmermann***
(PH FHNW)

"I'VE NEVER COOKED WITH MY MATHS TEACHER" – THE DUALITY OF MATHEMATICS





Tetsu **Yamaguchi**, Shin **Watanabe***

(The Mathematics Certification Institute of Japan)

SELF LEARNING MATHEMATICS ON LIFELONG LEARNING

Andrea **Maffia*** (1), Maria Alessandra **Mariotti** (2)

(1: University of Modena and Reggio Emilia; 2: University of Siena)

ADULTS' CONCEPTION OF MULTIPLICATION: HOW DOES IT CHANGE ALONG STUDIES?

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 4045/46

Session Chair: Pradeep Kumar **Misra**, Evelyn **Süss-Stepancik**

Presentations: R. **Ramanujam***

(Institute of Mathematical Sciences)

THEMES AND PROCESSES IN THE ADULT MATHEMATICS CLASSROOM

Barbara **Miller-Reilly*** (1), Charles **O'Brien** (2)

(1: University of Auckland)

A TALE OF TWO JOURNEYS

Jürgen **Maaß***

(University of Linz)

THINKING ABOUT RELATIONS BETWEEN ADULTS LEARNING MATHEMATICS AND REALITY

TSG 7 – Popularization of mathematics

Co-chairs: Christian **Mercat** (France), Patrick **Vennebush** (USA)

Team members: Chris **Budd** (UK), Carlota **Simões** (Portugal), Jens **Struckmeier** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, lecture hall A

Session Chair: Patrick **Vennebush**

Presentations: André **Ross** (4), Alexandra **Haedrich** (2), France **Caron** (3), Frédéric Gourdeau* (1),

Bernard R. **Hodgson** (1)

(1: Université Laval; 2: Institut des sciences mathématiques; 3: Université de Montréal;

4: Cégep de Lévis-Lauzon)

ACCROMATH: TEN YEARS OF POPULARIZATION OF MATHEMATICS AIMED AT TEACHERS AND STUDENTS

Vasiliy **Akimushkin** (1), Athit **Maitarattanakon** (2), Sergei **Pozdniakov*** (2,1), Alexey **Pukhov** (3)

(1: Saint-Petersburg State University; 2: Saint-Petersburg Electrotechnical University)

POPULARIZATION THROUGH ACTIVITY

Andreia Oliveira **Hall*** (1), Sónia **Pais** (2)

(1: University of Aveiro; 2: Polytechnic Institute of Leiria)

THE MATHEMATICAL CIRCUS PROJECT

Vijayakumar **Ambat***

(COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY)

MATHEMATICS TO THE MASSES- SOME SUCCESS STORIES FROM INDIA

Topic Study Groups

TSG

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, lecture hall A

Group A – Session Chair: Carlota Isabel Leitão Pires **Simoes**

Presentations: Andreas Daniel **Matt***, Bianca **Violet**
(Mathematisches Forschungsinstitut Oberwolfach)

COLLABORATIVE MATHEMATICS COMMUNICATION – EXPERIENCES AND EXAMPLES

Abdulkadir **Erdogan***

(Anadolu University)

EXAMPLES OF POPULARIZATION ACTIVITIES IN TURKEY:
EFFECTS, OPPORTUNITIES AND CHALLENGES

Nitsa **Movshovitz-Hadar***

(Technion – Israel Institute of Technology)

MATHEMATICS OVER A CUP OF COFFEE OR: AN ATTEMPT TO CHANGE THE COMMON
PUBLIC IMAGE OF THE QUEEN AND SERVANT OF SCIENCE

Location: E: mint, Economical Building, room 2079

Group B – Session Chair: Patrick **Vennebush**

Presentations: Anna **Weltman*** (1), Justin **Lanier** (2), Paul **Salomon** (3)

(1: University of California; 2: Georgia Institute of Technology; 3: John Burroughs School)

MATH MUNCH: WELCOMING KIDS TO THE MATHEMATICAL INTERNET

Michela **Maschietto** (1), Marco **Turrini*** (2)

(1: University of Modena e Reggio Emilia; 2: Liceo scientifico "A. Tassoni" MIUR;

2: Liceo scientifico "A. Tassoni" MIUR)

THE LABORATORY OF MATHEMATICAL MACHINES: EXHIBITIONS, EDUCATIONAL
RESEARCH AND SESSIONS FOR STUDENTS

Violeta **Vasilevska***

(Utah Valley University)

POPULARIZING MATH THROUGH OUTREACH PROGRAMS FOR YOUNG WOMEN

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, lecture hall A

Session Chair: Chris **Budd**

Presentations: Adi Nur **Cahyono*** (1,2), Matthias **Ludwig** (1)

(1: Goethe University Frankfurt; 2: Semarang State University)

MATHCITYMAP: EXPLORING MATHEMATICS AROUND THE CITY

Ana Cristina **Oliveira***

(Atractor Association)

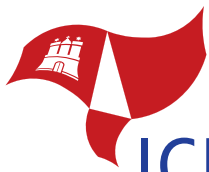
TRACTOR – POPULARIZATING MATHEMATICS THROUGH VIRTUAL CONTENT

Donna Ann **Dietz***

(American University)

THE USE OF MOBILE APPS TO ENHANCE STUDENT ENJOYMENT AND SKILLS
IN RECREATIONAL MATHEMATICS





Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, lecture hall A

Session Chair: Christian **Mercat**

Presentations: Rajaratnam Athmaraman **Veeravalli***

(The Association of Mathematics Teachers of India)

AN R & D AGENDA FOR POPULARISATION OF MATHEMATICS.

Nicolas **Pelay** (2), Alix **Boissiere*** (1)

(1: Plaisir Maths; 2: LDAR)

THE POPULARIZATION OF MATHEMATICS WITH THE DIDACTICAL AND PLAY-BASED CONTRACT

Martin **Andler*** (1, 2)

(1: Université de Versailles St Quentin)

LESSONS FROM A LARGE SCALE EXPERIMENT IN MATHEMATICS POPULARISATION IN FRANCE (CAP'MATHS, 2012 – 2016)

Hong **Zhang*** (1), Likun **Sun** (2)

(1: Sichaun Nomal University; 2: Shanghai Pudong Institute of Education Development)

THE IMPACT OF MATHEMATICS TRANSMISSION ON THE MATHEMATICS DEVELOPMENT IN THE PERIOD OF ANTI-JAPANESE WAR IN SICHUAN PROV

TSG 8 – Teaching and learning of arithmetic and number systems (focus on primary education)

Co-chairs: Pi-Jen **Lin** (Chinese Taipei), Terezinha **Nunes** (UK)

Team members: Shuhua **An** (USA), Beatriz Vargas **Dorneles** (Brazil),

Elisabeth **Rathgeb-Schnierer** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall A

Session Chair: Terezinha **Nunes**

Presentations: Lieven **Verschaffel***, Joke **Torbeyns**, Greet **Peters**, Bert **De Smedt**,

Pol **Ghesquière**

(KU Leuven)

THE ASTONISHING EFFICACY OF THE ADDITION BY SUBTRACTION STRATEGY IN THE NUMBER DOMAIN UP TO 1000

Terezinha **Nunes***, Peter **Bryant**, Deborah **Evans**, Rossana **Barros**, Philea **Chim**, Susan **Baker**

(Department of Education)

THE SIGNIFICANCE OF MATHEMATICAL REASONING AND ARITHMETIC FOR MATHEMATICAL ACHIEVEMENT IN PRIMARY SCHOOL

Natalie Ming Yeng **Kheu***

(University of Oxford)

LEARNING NUMBERS IN DIFFERENT LANGUAGES

Joke **Torbeyns*** (1), Marian **Hickendorff** (2), Lieven **Verschaffel** (1)

(1: KU Leuven; 2: Leiden University)

DUTCH AND FLEMISH 9-12-YEAR-OLDS' USE OF NUMBER-BASED AND DIGIT-BASED STRATEGIES ON MULTI-DIGIT SUBTRACTIONS

Topic Study Groups

TSG

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall A

Group A – Session Chair: Elisabeth **Rathgeb-Schnierer**

Presentations: Elisabeth **Rathgeb-Schnierer*** (1), Michael **Green** (2)

(1: University of Education; 2: University of North Carolina)

PROFILES OF COGNITIVE FLEXIBILITY IN ARITHMETIC REASONING:
A CROSS-COUNTRY COMPARISON OF ELEMENTARY STUDENTS (USA/GER)

Marian **Hickendorff***

(Leiden University)

DUTCH 12-YEAR-OLDS' USE OF SHORTCUT STRATEGIES IN SOLVING MULTIDIGIT
ARITHMETIC PROBLEMS

Andreas **Schulz***

(University of Education Freiburg)

DEVELOPING CALCULATION STRATEGY USE IN DIVISION –
EFFECTS OF AN INTERVENTION STUDY

Jake **McMullen***, Minna M. **Hannula-Sormunen**, Mikko **Kainulainen**, Erno **Lehtinen**

(University of Turku)

ENHANCING SPONTANEOUS FOCUSING ON QUANTITATIVE RELATIONS IN
PRIMARY SCHOOL

Location: I: blue, Philosophical Tower, room 1009

Group B – Session Chair: Beatriz Vargas **Dorneles**

Presentations: Beatriz Vargas **Dorneles***

(Universidade Federal do Rio Grande do Sul)

COUNTING IN THE FIRST YEARS: THE CASE OF TWO DIFFERENT SYSTEMS

Yeong Ok **Chong*** (1), Yoo Kyung **Jung** (2)

(1: GYEONGIN NATIONAL UNIVERSITY OF EDUCATION; 2: DANGDONG ELEMENTARY SCHOOL)

5TH AND 6TH GRADE KOREAN STUDENTS' PROPORTIONAL REASONING ABILITIES

Jeanne **Koudogbo***

(UNIVERSITÉ DE SHERBROOKE)

DECIMAL NUMBER SYSTEM: KNOWLEDGE OF QUEBEC STUDENTS EDUCATED UNDER
THE 2001/1981 PROGRAMS AND TEACHING SITUATIONS

Ema **Mamede***

(University of Minho)

YOUNG CHILDREN CAN LEARN TO REASON AND TO NAME FRACTIONS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall A

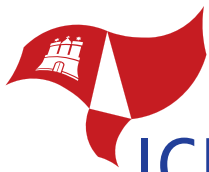
Group A – Session Chair: An **Shuhua**

Presentations: Michael **Gaidoschik*** (1,2), Anne **Fellmann** (3), Silvia **Guggenbichler** (2)

(1: Alpen Adria Universität Klagenfurt; 2: PH Kärnten; 3: PH Salzburg)

MASTERY OF FACTS TO 20 IN FIRST GRADE: TWO TEACHERS,
TWO WAYS OF TEACHING, TWO KINDS OF SUCCESS





TSG

An **Shuhua***

(California State University)

ASSESSING STUDENT LARNING IN ARITHMETIC AND NUMBER SYSTEMS

Angel **Mizzi*** (1), Ban Heng **Choy** (2), Mi Yeon **Lee** (3)

(1: University of Duisburg-Essen; 2: National Institute of Education; 3: Arizona State University)

TEXTBOOK SIGNATURES: AN EXPLORATORY STUDY OF THE NOTION OF FRACTIONS
IN GERMANY, SINGAPORE, AND SOUTH KOREA

Rubi **Real***, Olimpia **Figueras**

(Centro de Investigación y de Estudios Avanzados)

A TEACHING MODEL OF FRACTIONS FOR EARLY GRADES OF MEXICAN
PRIMARY SCHOOL

Location: I: blue, Philosophical Tower, room 1009

Group B – Session Chair: Elisabeth **Rathgeb-Schnierer**

Presentations: Rossana **Barros***, Lars-Erik **Malmberg**

(University of Oxford)

PRECURSORS FOR LEARNING FRACTIONS

Sutarto **Hadi***, Kamaliyah **Kamaliyah**

(Lambung Mangkurat University)

THE FOURTH GRADERS' SKILL IN COMPUTATIONAL ESTIMATION

Wei-Min **Hsu***, Hsin-Sheng **Huang**

(National Pingtung University)

A COMPARISON OF FRACTION AND DECIMAL PROBLEMS IN THE ELEMENTARY
MATHEMATICS TEXTBOOKS OF TAIWAN, FINLAND AND SINGAPORE

Sayonita Ghosh **Hajra*** (1), Victoria **Kofman** (2)

(1: University of Utah; 2: Stella Academy)

NEED OF THE HOUR: TEACHING MENTAL MATH STRATEGIES TO
PRE-SERVICE TEACHERS

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall A

Session Chair: Lin **Pi-Jen**

Presentations: Lin **Pi-Jen***

(National Hsinchu University of Education)

FOSTERING NOVICE TEACHERS' KNOWLEDGE OF STUDENTS' ERRORS ON
FRACTIONS DIVISION BY USING RESEARCHED-BASED CASES

Xenia **Vamvakoussi*** (1), Lina **Vrakas** (1), Aggeliki **Liolioussi** (2), Jake **McMullen** (3)

(1: University of Ioannina; 2: University of Athens; 3: University of Turku)

YOUNG CHILDREN'S SPONTANEOUS FOCUSING ON SIMPLE MULTIPLICATIVE RELATIONS

Charlotte **Rechtsteiner-Merz***, Elisabeth **Rathgeb-Schnierer**

(PH Weingarten)

"ZAHLENBLICKSCHULUNG" AS APPROACH TO DEVELOP FLEXIBILITY IN MENTAL
CALCULATION IN ALL STUDENTS

Bruce **Brown***

(Rhodes University)

THINKING IN ACTION: EMBODIMENT AND STRUCTURE IN EARLY RATIONAL
NUMBER LEARNING

TSG 9 – Teaching and learning of measurement (focus on primary education)

Co-chairs: Christine **Chambris** (France), Barbara **Dougherty** (USA)

Team members: Insook **Chung** (USA), Silke **Ruwisch** (Germany), (Ravi) K. **Subramaniam** (India)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 4020

Session Chair: Christine **Chambris**

Presentations: Jeffrey **Barrett*** (1), Craig **Cullen** (1), Julie **Sarama** (2), Douglas **Clements** (2)
(1: Illinois State University; 2: University of Denver)

INVESTIGATING THE INTERSECTION OF SPATIAL MEASUREMENT AND
SCHOOL MATHEMATICS

Arindam **Bose** (2), Kalyanasundaram **Subramaniam*** (1)

(1: Homi Bhabha Centre for Science Education; 2: University of South Africa)

IMPLICATIONS OF OUT-OF-SCHOOL KNOWLEDGE OF MEASUREMENT
FOR SCHOOL LEARNING

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 4020

Session Chairs: Jeffrey **Barrett**, Subramaniam **Kalyanasundaram**

Presentations: Richard **Lehrer***, Leona **Schauble**, Amy **Holmes**

(Vanderbilt University/Peabody College)

TRANSITIONS IN TEACHERS' PEDAGOGICAL PRACTICES AND CONCEPTIONS
OF MEASUREMENT SUPPORT CHILDREN'S CONCEPTUAL CHANGE

Linda **Venenciano***

(University of Hawaii at Manoa)

USING MEASUREMENT AS A VEHICLE FOR DEVELOPING MATHEMATICS THINKING

Christine **Chambris***

(Universite de Cergy-Pontoise)

A BRIEF HISTORY OF THE RELATIONS BETWEEN NUMBERS AND QUANTITIES
IN THE PRIMARY CURRICULUM IN FRANCE

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 4020

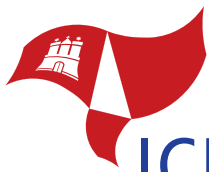
Session Chairs: Linda **Venenciano**, Insook **Chung**

Presentations: Cheryl L. **Eames*** (1), Jeffrey E. **Barrett** (2), Craig J. **Cullen** (2), David **Klanderma** (3)

(1: Southern Illinois University Edwardsville; 2: Illinois State University; 3: Trinity Christian College)

EVALUATING A HYPOTHETICAL LEARNING TRAJECTORY FOR LENGTH
MEASUREMENT USING A PARTIAL CREDIT RASCH MODEL





Julie **Sarama*** (1), Douglas **Clements** (1), Jeffrey **Barrett** (2)

(1: University of Denver; 2: Illinois State University)

DEVELOPMENT OF FOUNDATIONAL COGNITIONS AND CONCEPTS OF MEASUREMENT IN THE EARLY YEARS

Jeenath **Rahaman***

(Tata Institute of Fundamental Research)

CONSTRUCTING THE CONCEPT OF AREA MEASUREMENT IN A CLASSROOM

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 4020

Session Chair: Christine **Chambris**

Presentations: Valérie **Munier***, Aurélie **Chesnais**

(LIRDEF)

MEASURE AND MEASUREMENT IN PHYSICS AND MATHEMATICS EDUCATION: EPISTEMOLOGICAL ISSUES AND TREATMENT WITHIN TEXTBOOKS

TSG 10 – Teaching and learning of early algebra

Co-chairs: Carolyn **Kieran** (Canada), JeongSuk **Pang** (Korea)

Team members: Swee Fong **Ng** (Singapore), Deborah **Schifter** (USA),

Anna Susanne **Steinweg** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall F

Session Chairs: Carolyn **Kieran**, JeongSuk **Pang**

Presentations: Maria **Blanton*** (1), Barbara **Brizuela** (2), Ana **Stephens** (3)

(1: TERC; 2: Tufts University; 3: University of Wisconsin Madison)

ELEMENTARY CHILDREN'S ALGEBRAIC THINKING

John **Mason***

(University of Oxford & Open University)

HOW EARLY IS TOO EARLY FOR THINKING ALGEBRAICALLY?

Nicolina **Malara*** (1), Giancarlo **Navarra** (2)

(1: University of Modena & Reggio Emilia (Italy); 2: University of Modena & Reggio Emilia (Italy))

EPISTEMOLOGICAL ISSUES IN EARLY ALGEBRA: OFFERING TEACHERS NEW WORDS AND PARADIGMS TO PROMOTE PUPILS' ALGEBRAIC THINKING

David William **Carraher*** (1), Analucia Dias **Schliemann** (2)

(1: TERC; 2: Tufts University)

FUNCTIONAL RELATIONS IN EARLY ALGEBRAIC THINKING

Carolyn **Kieran***

(Université du Québec à Montréal)

BEGINNINGS OF THE EARLY ALGEBRA MOVEMENT AND THE NATURE OF ITS EARLY RESEARCH

Topic Study Groups

TSG

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall F

Session Chair: Swee Fong **Ng**

Presentations: JeongSuk **Pang***

(Korea National University of Education)

A REVIEW OF RECENT RESEARCH THAT FOREGROUNDS THE EARLY ALGEBRA LEARNER

Kathrin **Akinwunmi***

(TU Dortmund)

ON THE DEVELOPMENT OF VARIABLE CONCEPTS BY GENERALIZING MATHEMATICAL PATTERNS IN PRIMARY SCHOOL

Aisling **Twohill***

(Dublin City University)

THE APPROACHES TO SOLUTION OF LINEAR FIGURAL PATTERNS ADOPTED BY CHILDREN ATTENDING IRISH PRIMARY SCHOOLS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall F

Session Chair: Deborah **Schifter**

Presentations: Swee Fong **Ng***

(Nanyang Technological University)

A NEUROSCIENCE PERSPECTIVE ON EARLY ALGEBRA:
SYMBOLIC AND DIAGRAMMATIC APPROACHES TO ALGEBRA PROBLEM SOLVING

Yasufumi **Kuroda*** (1), Naoko **Okamoto** (2)

(1: Kyoto University of Education; 2: Ritsumeikan University)

CHANGES IN BRAIN ACTIVITY WHILE ENGAGING IN NUMBER SEQUENCE QUESTIONS OF VARYING DIFFICULTY

Max **Stephens***, Cath **Pearn**

(The University of Melbourne)

FRACTION TASKS AND THEIR LINKS TO ALGEBRAIC THINKING

Anna Susanne **Steinweg***

(University of Bamberg)

ALGEBRAIC THINKING – MATHEMATICAL KEY IDEAS

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall F

Session Chairs: Carolyn **Kieran**, JeongSuk **Pang**

Presentations: Deborah **Schifter** *

(Education Development Center)

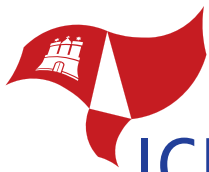
BRINGING EARLY ALGEBRA INTO ELEMENTARY CLASSROOMS

Jodie **Hunter***

(Massey University)

SCAFFOLDING TEACHER PRACTICE TO DEVELOP EARLY ALGEBRAIC REASONING





Susanne Marie **Strachota*** (1), Maria **Blanton** (2), Angela Murphy **Gardiner** (2), Bárbara **Brizuela** (3)
(1: University of Wisconsin – Madison; 2: TERC; 3: Tufts University)
CYCLES OF GENERALIZING ACTIVITIES IN THE CLASSROOM

TSG 11 – Teaching and learning of algebra

Co-chairs: Rakhi **Banerjee** (India), Amy **Ellis** (USA)
Team members: Helen **Chick** (Australia), Astrid **Fischer** (Germany),
Heidi Strømskag **Måsøval** (Norway)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30
Location: G: green, Social Science Building, room 27
Session Chair: Amy **Ellis**

Presentations: Kaye **Stacey***
(University of Melbourne)
ALGEBRA RESEARCH TO GUIDE TEACHING

Andrew **Izsak***, Sybilla **Beckmann**, Eun **Jung**, Ibrahim **Olmez**
(The University of Georgia)
CONNECTING MULTIPLICATION, UNIT FRACTIONS, AND EQUATIONS

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30
Location: G: green, Social Science Building, room 27
Session Chair: Rakhi **Banerjee**

Presentations: Maria **Blanton** (1), Barbara **Brizuela*** (2), Anna **Stephens** (3)
(1: TERC; 2: Tufts University; 3: University of Wisconsin Madison)
CHILDREN'S UNDERSTANDING AND USE OF VARIABLE NOTATION

Jan **Block***
(Technische Universität Braunschweig)
FLEXIBLE ALGEBRAIC ACTION: SOLVING OF QUADRATIC EQUATIONS

Third Session: Friday, 29 July 2016, 12.00 – 13.30
Location: G: green, Social Science Building, room 27
Session Chair: Amy **Ellis**

Presentations: Jinfa **Cai***
(University of Delaware)
EARLY ALGEBRA LEARNING: ANSWERED AND UNANSWERED QUESTIONS

Thomas **Janßen***
(University of Bremen)
DEVELOPING ALGEBRAIC STRUCTURE SENSE OF LINEAR EQUATIONS AS TUNING INTO A NEW ACTIVITY

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: G: green, Social Science Building, room 27

Session Chair: Rakhi **Banerjee**

Presentations: Heidi **Strømskag***

(Norwegian University of Science and Technology)

EVOLUTION OF THE MILIEU FOR A PARTICULAR PIECE OF MATHEMATICAL KNOWLEDGE

Erik **Tillema***, Andrew **Gatza**

(Indiana University Purdue University Indianapolis)

A QUANTITATIVE APPROACH TO ESTABLISHING CUBIC IDENTITIES

TSG 12 – Teaching and learning of geometry (primary level)

Co-chairs: Sinan **Olkun** (Turkey), Ewa **Swoboda** (Poland)

Team members: Paola **Vighi** (Italy), Yuan **Yuan** (Chinese Taipei), Bernd **Wollring** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 206

Session Chair: Ewa **Swoboda**

Presentations: Sinan **Olkun*** (1), Mehmet Hayri **Sari** (2)

(1: TED University; 2: Nevsehir Haci Bektas University)

GEOMETRIC ASPECT OF NUMBER LINE ESTIMATIONS

Douglas **Clements***, Julie **Sarama**

(University of Denver)

YOUNG CHILDREN'S CONCEPTUALIZATION AND LEARNING OF GEOMETRIC FIGURES

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 206

Session Chairs: Paola **Vighi**, Sinan **Olkun**

Presentations: Yuan **Yuan***

(Chung Yuan Christian University)

EFFECT OF DIFFERENT MANIPULATIVES ON FIRST GRADERS' LEARNING OF THE ABILITY TO COUNT CUBIC BLOCKS IN A 3-D FIGURE

Raquel Isabel **Barrera-Curin*** (1), Caroline **Bulf** (2), Fabienne **Venant** (3)

(1: Université du Québec à Montréal; 2: Université de Bordeaux; 3: Université du Québec à Montréal)

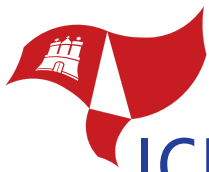
FRANCE-QUÉBEC COMPARISON ON LANGUAGE PRACTICES IN GEOMETRY CLASS IN PRIMARY SCHOOL

Tsu-Nan **Lee***

(The University of Melbourne)

USING QUESTIONING AND ARGUMENTATIVE ACTIVITIES TO HELP GRADE 5 STUDENTS GENERALIZE TRIANGLE PROPERTIES





Third Session: Friday, 29 July 2016, 12.00 – 13.30
Location: H: orange, Educational Building, room 206
Session Chair: Sinan **Olkun**

Presentations: Paola **Vighi***
(University of Parma)
FROM ABSTRACT ART TO GEOMETRICAL UNDERSTANDING

Masakazu **Okazaki***
(Okayama University)
HYPOTHESIZING HOW FIFTH GRADERS CONSTRUCT GEOMETRIC DEFINITIONS
BASED ON INCLUSION RELATIONS AMONG GEOMETRIC FIGURES

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30
Location: H: orange, Educational Building, room 206
Session Chair: Yuan **Yuan**

Presentations: Darina **Jirotkova***
(Faculty of Education)
SCHEME OF GEOMETRICAL CONCEPTS

Ewa **Swoboda***
(University of Rzeszów)
THE RHYTHMICAL ORGANIZATION OF SPACE AND THE CHILD'S INTELLECTUAL DEVELOPMENT

TSG 13 – Teaching and learning of geometry – secondary level

Co-chairs: Ui Hock **Cheah** (Malaysia), Patricio **Herbst** (USA)
Team members: Matthias **Ludwig** (Germany), Philippe **Richard** (Canada), Sara **Scaglia** (Argentina)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30
Location: E: mint, Economical Building, room 2101/2105
Session Chair: Ui-Hock **Cheah**

Presentations: Alain **Kuzniak***
(Université Paris Diderot)
RESEARCH ON GEOMETRY EDUCATION: THE NEED OF THEORETICAL BENCHMARKS

Philippe R. **Richard*** (1), Gagnon **Michel** (2), Fortuny Josep **Maria** (3)
(1: Université de Montréal; 2: École Polytechnique de Montréal; 3: Universitat Autònoma de Barcelona)
THE ARTICULATION OF GEOMETRY PROBLEMS: A MAJOR EDUCATIONAL CHALLENGE

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30
Location: E: mint, Economical Building, room 2101/2105
Group A – Session Chair: Philippe R. **Richard**

Presentations: Günter **Maresch***
(University of Salzburg)
HOW TO DEVELOP SPATIAL ABILITY? RESULTS FROM THE RESEARCH PROJECT GEODIKON

Topic Study Groups

TSG

Leah Michelle **Fraze***, Michael T. **Battista**, Candace **Joswick**, Emanuel **Clayton**
(The Ohio State University)

STUDENTS' USE OF PROPERTY KNOWLEDGE AND SPATIAL VISUALIZATION
IN REASONING ABOUT 2D ROTATIONS

Stephan **Berendonk**, Marc **Sauerwein***
(University of Bonn)

EPISTEMOLOGICAL FEATURES OF A CONSTRUCTIONAL APPROACH TO
REGULAR 4-POLYTOPES

Location: E: mint, Economical Building, room 2163/2168

Group B – Session Chair: Matthias **Ludwig**

Presentations: Mohan **Chinnappan*** (1), Bruce **White** (2), Sven **Trenholm** (3)

(1: University of South Australia; 2: University of South Australia; 3: University of South Australia)
SYMBIOSIS BETWEEN SPECIALISED AND PEDAGOGICAL KNOWLEDGE IN GEOMETRY

Agida **Manizade*** (1, 3), Dragana **Martinovic** (2)

(1: Radford University; 2: University of Windsor;
3: Secondary Mathematics Professional Development Center)

GEOMETRY TEACHERS' KNOWLEDGE: INSIGHTS FROM THE TRAPEZOID STUDY

Carlotta **Soldano*** (1), Yael **Luz** (2)

(1: University of Torino; 2: University of Haifa)

PLAYING WITH GEOMETRY: A GAME, AN EDUCATIONAL INQUIRY ACTIVITY
OR AN ASSESSMENT TASK?

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2101/2105

Group A – Session Chair: Sara **Scaglia**

Presentations: Sharon Louise **Senk*** (1), Denisse Rubilee **Thompson** (2)

(1: Michigan State University; 2: University of South Florida)

EXPLORING MODELS OF SECONDARY GEOMETRY ACHIEVEMENT

Carine **Steyn***, Tulsı **Morar**

(Nelson Mandela Metropolitan University)

TYPICAL ERRORS IN GEOMETRY OF GRADE 9 LEARNERS IN SOUTH AFRICA

Hilal **Gulkilik*** (1), Hasan Hüseyin **Ugurlu** (2), Nejla **Yürük** (3), Patricia **Moyer-Packenham** (4)

(1: Gazi University; 2: Gazi University; 3: Gazi University; 4: Utah State University)

THE GROWTH OF MATHEMATICAL UNDERSTANDING:
ELIF'S ENGAGEMENT WITH REPRESENTATIONS IN PIRIE-KIEREN LEVELS

Location: E: mint, Economical Building, room 2163/2168

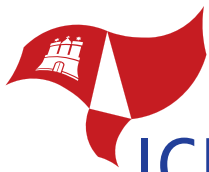
Group B – Session Chair: Ui-Hock **Cheah**

Presentations: Scott **Steketee*** (1), Daniel **Scher** (2)

(1: 21st Century Partnership for STEM Education; 2: McGraw-Hill Education)

ENACTING FUNCTIONS FROM GEOMETRY TO ALGEBRA





TSG

Brittany April **Webre***, Shawnda **Smith**, Gilbert **Cuevas**
(Texas State University)

DIFFERENCE IN SELF-REPORTING IMPLEMENTATION OF INSTRUCTIONAL STRATEGIES USING A DYNAMIC GEOMETRY APPROACH

Alexander Kevin **White***, Zhonghong **Jiang**, M. Alejandra **Sorto**
(Texas State University)

THE EFFECT OF DYNAMIC GEOMETRY APPROACH ON GEOMETRY ACHIEVEMENT AND CONJECTURE ABILITY

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2101/2105

Session Chair: Matthias **Ludwig**

Presentations: Ui-Hock **Cheah***
(Methodist Council of Education)

DESIGNING INSTRUCTION TOWARDS MATHEMATICAL LITERACY IN GEOMETRY: A CASE STUDY

Michelle **Cirillo***
(University of Delaware)

ENGAGING STUDENTS WITH NON-ROUTINE GEOMETRY PROOF TASKS

Patricio G. **Herbst***
(University of Michigan)

IS THE WORK OF TEACHING GEOMETRY SUBJECT SPECIFIC?

TSG 14 – Teaching and learning of probability

Co-chairs: Carmen **Batanero** (Spain), Egan **Chernoff** (Canada)

Team members: Joachim **Engel** (Germany), Ernesto **Sánchez** (Mexico), Hollylynn **Lee** (USA)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, room 18/19

Session Chair: Carmen **Batanero**

Presentations: Manfred **Borovcnik*** (1), Ramesh **Kapadia** (2)
(1: University of Klagenfurt; 2: University of Klagenfurt)

REASONING WITH RISK: A SURVIVAL GUIDE

Cynthia **Langrall***
(Illinois State University)

THE RISE AND FALL OF PROBABILITY IN THE K–8 MATHEMATICS CURRICULUM IN THE UNITED STATES

Hollylynn **Lee*** (1), Helen **Doerr** (2)
(1: North Carolina State University; 2: Syracuse University)

A FRAMEWORK OF PROBABILITY CONCEPTS NEEDED FOR TEACHING REPEATED SAMPLING APPROACHES TO INFERENCE

Topic Study Groups

TSG

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, room 18/19

Session Chair: Hollylynn **Lee**

Presentations: Joachim **Engel***

(Ludwigsburg University of Education)

BETWEEN FEAR AND GREED: THE SIX LOOSES

Ernesto Sánchez*, Miguel **Mercado**, Jaime **García**

(Centro de Investigación y de Estudios Avanzados del IPN)

THEORETICAL DOGMATISM AND EMPIRICAL COMMITMENT IN THE INFORMAL
PROBABILISTIC REASONING OF HIGH SCHOOL STUDENTS

Egan **Chernoff***, Ilona **Vashchyshyn**, Heidi **Neufeld**

(University of Saskatchewan)

COMPARING THE RELATIVE PROBABILITIES OF EVENTS

Peter **Bryant*** (1), Terezinha **Nunes** (1), Deborah **Evans** (1), Laura **Gottardis** (1),

Maria-Emmanouela **Terlektsi** (2)

(1: University of Oxford; 2: Oxford Brookes University)

TEACHING 9 AND 10 YEAR OLD CHILDREN ABOUT RANDOMNESS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, room 18/19

Group A – Session Chair: Joachim **Engel**

Presentations: Caterina **Primi***, Francesca **Chiesi**

(University of Florence)

STATISTICS ANXIETY: A MEDIATOR IN LEARNING PROBABILITY

Assumpta **Estrada*** (1), Carmen **Batanero** (2), Carles **Comas** (1), Carmen **Díaz** (3)

(1: University of Lleida; 2: University of Granada; 3: University of Huelva)

EXPLORING TEACHERS' ATTITUDES TOWARDS PROBABILITY AND ITS TEACHING

Emilse **Gómez-Torres*** (1), Carmen **Díaz** (2), Jose Miguel **Contreras** (3)

(1: Universidad Nacional de Colombia; 2: Universidad de Huelva; 3: Universidad de Granada)

PROSPECTIVE TEACHERS SOLUTIONS TO A PROBABILITY PROBLEM
IN A SAMPLING CONTEXT

Robert Adam **Molnar***

(Oklahoma State University)

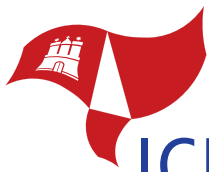
HIGH SCHOOL MATHEMATICS TEACHERS' UNDERSTANDING
OF INDEPENDENT EVENTS

Susanne **Podworny***

(University of Paderborn)

DESIGN OF A COURSE FOR LEARNING PROBABILITY VIA SIMULATIONS
WITH TINKERPLOTS





Location: K: purple, Law Building, room 15+16

Group B – Session Chair: Ernesto **Sánchez**

Presentations: Pedro Rubén **Landín***, Jesús **Salinas**
(CCH-UNAM)

PROBABILISTIC REASONING IN HIGH SCHOOL STUDENTS ON SAMPLE SPACE
AND PROBABILITY OF COMPOUND EVENTS

Lydia **Mutara** (1), Judah Paul **Makonye*** (2)

(1: Chris J. Botha Secondary School; 2: University of the Witwatersrand;

2: University of the Witwatersrand)

LEARNERS' USE OF PROBABILITY MODELS IN ANSWERING PROBABILITY
TASKS IN SOUTH AFRICA

Roberto Alves **Oliveira***

(Batista Renzi State School)

THE TEACHING OF PROBABILITY IN CONTEXT THROUGH READING AND WRITING
STRATEGIES AT SECONDARY EDUCATION

Maria del Mar **López-Martín**, Carmen **Batanero***, José Miguel **Contreras**, Juan Jesús **Ortiz**
(University of Granada)

CHARACTERIZING THE PROBABILITY PROBLEMS PROPOSED
IN THE ENTRANCE TO UNIVERSITY TESTS IN ANDALUCIA

Haneet **Gandhi***

(University of Delhi)

UNDERSTANDING CHILDREN'S CONCEPTION OF RANDOMNESS THROUGH
EXPLORATIONS WITH SYMMETRICAL POLYHEDRONS

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, room 18/19

Session Chair: Egan **Chernoff**

Presentations: Rolf **Biehler***

(Universität Paderborn)

PROFESSIONAL DEVELOPMENT FOR TEACHING PROBABILITY AND INFERENCE
STATISTICS WITH DIGITAL TOOLS AT UPPER SECONDARY LEVEL

Per **Nilsson*** (1), Andreas **Eckert** (2)

(1: Örebro Universitet; 2: Linnaeus University)

INTERACTIVE EXPERIMENTATION IN PROBABILITY –
OPPORTUNITIES, CHALLENGES AND NEEDS OF RESEARCH

Rink **Hoekstra***

(University of Groningen)

RISK AS AN EXPLANATORY FACTOR FOR RESEARCHERS' INFERENTIAL
INTERPRETATIONS

TSG 15 – Teaching and learning of statistics

Co-chairs: Dani **Ben-Zvi** (Israel), Gail **Burrill** (USA)

Team members: Andreas **Eichler** (Germany), Dave **Pratt** (UK), Lucia **Zapata-Cardona** (Columbia)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 0079

Session Chairs: Gail **Burrill**, Dani **Ben-Zvi**

Presentations: Keren **Aridor***, Dani **Ben-Zvi**

(The University of Haifa)

STUDENTS' AGGREGATE REASONING WITH COVARIATION

Gail **Burrill***

(Michigan State University)

THE ROLE OF TECHNOLOGY IN BUILDING STUDENT UNDERSTANDING OF
FUNDAMENTAL CONCEPTS IN STATISTICS

Andreas **Eichler*** (1), Alexandra **Sturm** (2)

(1: University Kassel; 2: University of Education Freiburg)

STATISTICS TEACHERS' AFFECT – ATTITUDES, BELIEFS, MOTIVATION

Lucia **Zapata-Cardona***, Luis Miguel **Marrugo-Escobar**

(Universidad de Antioquia)

CRITICAL CITIZENSHIP IN COLOMBIAN STATISTICS TEXTBOOKS

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 0079

Group A – Session Chair: Andreas **Eichler**

Presentations: Pip **Arnold*** (1), Maxine **Pfannkuch** (2)

(1: Cognition Education Limited; 2: The University of Auckland)

POSING COMPARATIVE INVESTIGATIVE QUESTIONS

Yoon-Kyung **Lee*** (1), Cheong-Soo **Cho** (2)

(1: Graduate School; 2: Yeungnam University)

AN ANALYSIS OF STATISTICS CLASSROOM DISCOURSE BY PEIRCE'S ABDUCTION
AND TOULMIN'S ARGUMENT PATTERN

José Antonio Orta **Amaro*** (1), Ernesto Alonso **Sánchez** (2)

(1: Escuela Nacional para Maestras de Jardines de Niños; 2: Departamento de Matemática Educativa)

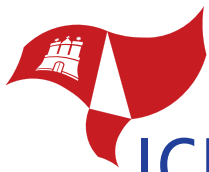
MIDDLE SCHOOL STUDENTS' REASONING ABOUT VARIATION IN RISK CONTEXTS

Travis **Weiland***

(University of Massachusetts Dartmouth)

CRITICAL STATISTICAL LITERACY IN SCHOOL MATHEMATICS





Location: E: mint, Economical Building, room 0077

Group B – Session Chair: Dave **Pratt**

Presentations: Christian **Büscher***

(TU Dortmund University)

STUDENTS' INFORMAL MEASURES BETWEEN OBJECTS AND TOOLS

Virginia Anne **Kinnear***, Julie Ann **Clark**

(Flinders University)

YOUNG CHILDREN'S ABDUCTIVE REASONING ABOUT DATA

Rima A. **Sibai***, Iman **Osta**

(Lebanese American University (LAU))

A STUDY OF STATISTICAL LITERACY IN A MATH CURRICULUM

Hiroto **Fukuda***

(Hiroshima University)

LIMITATION OF CAUSAL INQUIRY IN STATISTICS EDUCATION AND IDEA FOR OVERCOMING THE LIMITATION

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 0079

Group A – Session Chair: Dave **Pratt**

Presentations: Stephanie **Budgett***, Maxine **Pfannkuch**

(University of Auckland)

VISUALIZING CHANCE: TACKLING CONDITIONAL PROBABILITY MISCONCEPTIONS

Khairiani **Idris*** (1,2), Kai-Lin **Yang** (1)

(1: National Taiwan Normal University; 2: Islamic College of Malikussaleh Lhokseumawe)

A STUDY OF PRESERVICE EFL TEACHERS VALUES ON LEARNING STATISTICS

Jennifer **Noll***

(Portland State University)

A CASE STUDY OF A STUDENT'S STATISTICAL MODELING WITH TINKERPLOTS

Zeynep Medine **Özmen***, Adnan **Baki**

(Karadeniz Technical University)

COMPARING THE STATISTICAL LITERACY OF STUDENTS IN DIFFERENT UNDERGRADUATE PROGRAMS IN TERMS OF STATISTICAL PROCESS

Location: E: mint, Economical Building, room 0077

Group B – Session Chair: Lucia **Zapata-Cardona**

Presentations: Daniel **Frischemeier***

(University of Paderborn)

STATISTICAL REASONING OF PRESERVICE TEACHERS WHEN COMPARING GROUPS WITH TINKERPLOTS

Sandra Renee **Madden***

(University of Massachusetts Amherst)

EXPLORING SECONDARY TEACHER STATISTICAL LEARNING IN A BLENDED FORMAT STATISTICS AND MODELING COURSE

Hélia **Oliveira**, Ana **Henriques***
(Instituto de Educação)

TEACHERS' PERSPECTIVES ON TASKS AND TECHNOLOGY TO PROMOTE
STATISTICAL REASONING

Sylvain **Vermette***, Mathieu **Séguin**
(Université du Québec à Trois-Rivières)

TEACHERS' STATISTICAL KNOWLEDGE: THE CASE OF VARIABILITY

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 0079

Session Chairs: Gail **Burrill**, Dani **Ben-Zvi**

Presentations: Susan A. **Peters***, Amy **Stokes-Levine**
(University of Louisville)

TEACHER LEARNING: MEASURES OF VARIATION

Dave Pratt* (1), Graham **Griffiths** (1), David **Jennings** (2), Seb **Schmoller** (2)
(1: University College London; 2: Independent consultant)

TENSIONS AND COMPROMISES IN THE DESIGN OF A MOOC FOR ADULT LEARNERS
OF MATHEMATICS AND STATISTICS

Maike **Schindler***, Abdel **Seidou**
(Örebro University)

INFERENTIALISM IN STATISTICS EDUCATION RESEARCH

TSG 16 – Teaching and learning of calculus

Co-chairs: David **Bressoud** (USA), Victor **Martinez-Luaces** (Uruguay)

Team members: Imène **Ghedamsi** (Tunisia), Günter **Törner** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall C

Session Chair: Günter **Törner**

Presentations: David **Bressoud*** (1), Naneh **Apkarian** (2), Jessica **Ellis** (3), Estrella **Johnson** (4),
Sean **Larsen** (5), Chris **Rasmussen** (2)

(1: Macalester College; 2: San Diego State University; 3: Colorado State University; 4: Virginia Tech;
5: Portland State University)

EFFECTING CHANGE IN THE TEACHING AND LEARNING OF CALCULUS

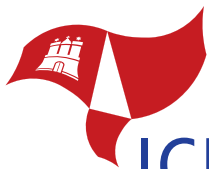
Nadia **Hardy**, Sarah **Mathieu-Soucy***
(Concordia University)

WHAT IS MATHEMATICAL THEORY AND WHAT IT IS USEFUL FOR:
THE VIEWS OF UNIVERSITY CALCULUS' STUDENTS

Oh Nam **Kwon** (1), YoungGon **Bae*** (2), Kuk Hwan **Oh** (1)
(1: Seoul National University; 2: Michigan State University)

DESIGN RESEARCH ON DEVELOPING INQUIRY-BASED MULTIVARIABLE CALCULUS
IN FLIPPED CLASSROOM





Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall C

Session Chair: Imène **Ghedamsi**

Presentations: Victor **Martinez-Luaces***

(FJR-Fing)

CALCULUS INVERSE MODELLING PROBLEMS IN TEACHER TRAINING COURSES

David C. **Webb***

(University of Colorado Boulder)

APPLYING PRINCIPLES FOR ACTIVE LEARNING TO PROMOTE STUDENT ENGAGEMENT IN UNDERGRADUATE CALCULUS

Yuliya **Melnikova***

(Indiana University of Pennsylvania)

THE PURPOSE AND PRACTICE OF CALCULUS I LABS: ALIGNMENT IN STUDENTS, TEACHING ASSISTANTS, AND INSTRUCTORS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall C

Session Chair: Victor **Martinez-Luaces**

Presentations: Imène **Ghedamsi***

(University of Tunis)

IMPACT OF TEACHER MANAGEMENT OF LEARNING SEQUENCE CONVERGENCE ON THE DEVELOPMENT OF STUDENTS' IMAGES

Vilma **Mesa***, Nina **White**, Sarah **Sobek**

(University of Michigan)

CALCULUS I TEACHING: WHAT CAN WE LEARN FROM SNAPSHOTS OF LESSONS FROM 18 SUCCESSFUL INSTITUTIONS?

Jacqueline Rene **Coomes***, Hyung Sook **Lee**

(Eastern Washington University)

COORDINATING SYMBOLIC AND GRAPHICAL MEANINGS OF FUNCTION NOTATION

Kevin C. **Moore*** (1), Patrick W. **Thompson** (2)

(1: University of Georgia; 2: Arizona State University)

CALCULUS AND GRAPHS AS EMERGENT TRACES

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall C

Session Chair: David **Bressoud**

Presentations: Isabelle **Bloch***

(University of Bordeaux)

A GAP AT THE TRANSITION SECONDARY/TERTIARY LEVEL: PARAMETRIC CURVES AND RESEARCH OF LIMITS

Topic Study Groups

TSG

Claudio Eduardo Fuentealba **Aguilera*** (1,2), Edelmira Rosa Badillo **Jiménez** (2),
Gloria María Sánchez-Matamoros **García** (3), María Trigueros **Gaisman** (4)
(1: Universidad Austral de Chile; 2: Universidad Autónoma de Barcelona; 3: Universidad de Sevilla;
4: Instituto Tecnológico Autónomo de México)

THE DERIVATIVE IN UNIVERSITY MATH:
TASKS THAT ALLOW OBSERVATION OF HIGH LEVELS OF UNDERSTANDING

Tolga **Kabaca*** (1), Ali **Delice** (2), Mahmut **Kertil** (2), Gülseren Karagoz **Akar** (3)
(1: Pamukkale University; 2: Marmara University; 3: Bogazici University)

A JOURNEY TO INTEGRATION: PROMOTING A ROBUST CONCEPTION OF INTEGRAL

TSG 17 – Teaching and learning of discrete mathematics (including logic, game theory and algorithms)

Co-chairs: Eric **Hart** (USA), Cecile O. **Buffet** (France)

Team members: Hans-Wolfgang **Henn** (Germany), Jim **Sandefur** (USA), Ahmed **Semri** (Algeria)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3030

Session Chairs: Eric W. **Hart**, James **Sandefur**

Presentations: Robert **Devaney***

(Department of Mathematics and Statistics)

DISCRETE DYNAMICAL SYSTEMS: A PATHWAY FOR STUDENTS TO BECOME
ENCHANTED WITH MATHEMATICS

Gerald Alan **Goldin***

(Rutgers University)

DISCRETE MATHEMATICS AND THE AFFECTIVE DIMENSION OF MATHEMATICAL
LEARNING AND ENGAGEMENT

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3030

Session Chairs: James **Sandefur**, Eric W. **Hart**

Presentations: Eric W. **Hart***

(Grand View University)

DISCRETE MATHEMATICAL MODELING IN THE SECONDARY CURRICULUM

Solomon **Garfunkel***

(COMAP)

FAIRNESS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3030

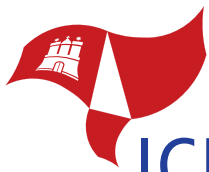
Session Chairs: Eric W. **Hart**, James **Sandefur**

Presentations: Margaret **Cozzens***

(Rutgers)

FOOD WEBS, GRAPHS, AND A 60-YEAR OLD PROBLEM STUDENTS CAN HELP SOLVE





Susanna **Epp***
(DePaul University)
DISCRETE MATHEMATICS FOR COMPUTER SCIENCE

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3030

Session Chairs: James **Sandefur**, Eric W. **Hart**

Presentations: Ximena **Colipan*** (1), Alvaro **Liendo** (2)
(1: Universidad Catolica del Maule; 2: Universidad de Talca)
MATHEMATICAL RESEARCH IN THE CLASSROOM VIA COMBINATORIAL GAMES

Tom **Coenen***, Frits **Hof**, Nellie **Verhoef**
(University of Twente)
COMBINATORIAL REASONING TO SOLVE PROBLEMS

Karina **Höveler***
(TU Dortmund)
CHILDREN'S COMBINATORIAL COUNTING STRATEGIES AND THEIR RELATIONSHIP
TO MATHEMATICAL COUNTING PRINCIPLES

TSG 18 – Reasoning and proof in mathematics education

Co-chairs: Guershon **Harel** (USA), Andreas **Stylianides** (UK)
Team members: Paolo **Boero** (Italy), Mikio **Miyazaki** (Japan), David **Reid** (Germany/Canada)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall B

Session Chair: Andreas **Stylianides**

Presentations: Gila **Hanna***
(OISE)
REFLECTIONS ON PROOF AS EXPLANATION

Viviane **Durand-Guerrier*** (1), Denis **Tanguay** (2)
(1: University of MONTPELLIER; 2: Université du Québec à Montréal)
WORKING ON PROOFS AS CONTRIBUTING TO CONCEPTUALIZATION –
THE CASE OF IR COMPLETENESS PROLEGOMENA TO A DIDACTICAL STUDY

Guershon **Harel***
(University of California)
TYPES OF EPISTEMOLOGICAL JUSTIFICATIONS

Paolo **Boero***, Giuseppina **Fenaroli**, Elda **Guala**
(Università di Genova)
REASONING AND PROOF IN ELEMENTARY TEACHER EDUCATION:
THE KEY ROLE OF THE CULTURAL ANALYSIS OF THE CONTENT

Topic Study Groups

TSG

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall B

Session Chair: Guershon **Harel**

Presentations: Maria Alessandra **Mariotti*** (1), Manuel **Goizueta** (2)

(1: University of Siena Italy; 2: Pontificia Universidad Católica de Valparaíso)

CONSTRUCTING AND VALIDATING A MATHEMATICAL MODEL: THE TEACHER'S PROMPT

Andreas J. **Stylianides***, Gabriel J. **Stylianides**

(University of Cambridge)

CLASSROOM-BASED INTERVENTIONS IN THE AREA OF PROOF:

ADDRESSING KEY AND PERSISTENT PROBLEMS OF STUDENTS' LEARNING

Mikio **Miyazaki*** (1), Junichiro **Nagata** (2), Kimiho **Chino** (1), Taro **Fujita** (3), Daisuke **Ichikawa** (4),
Shizumi **Shimizu** (5), Yasuo **Iwanaga** (1)

(1: Shinshu University; 2: Bunkyo; 3: Exeter University;

4: Attached Nagano Junior High School of Shinshu University; 5: Tekikyo University)

DEVELOPING A CURRICULUM FOR EXPLORATIVE PROVING IN LOWER SECONDARY
SCHOOL GEOMETRY

Kotaro **Komatsu*** (1), Tomoyuki **Ishikawa** (2), Akito **Narazaki** (3)

(1: Shinshu University; 2: Nagano Municipal High School; 3: Tojaku High School)

PROOF VALIDATION AND MODIFICATION BY EXAMPLE GENERATION:

A CLASSROOM-BASED INTERVENTION IN SECONDARY SCHOOL GEOMETRY

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall B

Group A – Session Chair: Andreas **Stylianides**

Presentations: Kathleen Mary **Melhuish** (1), Eva **Thanheiser*** (2)

(1: Teachers Development Group; 2: Portland State University)

TEACHER NOTICING OF JUSTIFYING IN THE ELEMENTARY CLASSROOM

Bettina **Pedemonte***

(San Jose State University)

HOW CAN A TEACHER SUPPORT STUDENTS IN CONSTRUCTING A PROOF?

Leander **Kempen***

(University of Paderborn)

HOW DO PRE-SERVICE TEACHERS RATE THE CONVICTION, VERIFICATION
AND EXPLANATORY POWER OF DIFFERENT KINDS OF PROOFS

Kwong Cheong **Wong*** (1), Rosamund **Sutherland** (2)

(1: The Hong Kong Polytechnic University; 2: University of Bristol; 2: University of Bristol)

REASONING-AND-PROVING IN SCHOOL MATHEMATICS TEXTBOOKS:

A CASE STUDY FROM HONG KONG

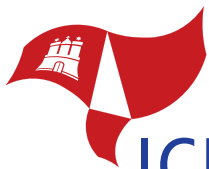
Jon D. **Davis***

(Western Michigan University)

IRISH TEACHERS' PERCEPTIONS OF REASONING-AND-PROVING AMIDST

A NATIONAL EDUCATIONAL REFORM





Location: I: blue, Philosophical Tower, room 756

Group B – Session Chair: Guershon **Harel**

Presentations: Xiaoheng **Yan*** (1), Gila **Hanna** (1), John **Mason** (2)
(1: OISE; 2: Oxford University)

IDENTIFYING AND USING KEY IDEAS IN PROOFS

Silke Lekaas*, Gjert-Anders **Askevold**
(Bergen University College)

MATHEMATICAL ARGUMENTATION IN PUPILS' WRITTEN DIALOGUES

Tina Kathleen **Rapke***, Amanda **Allan**
(York University)

**WHAT MAKES A GOOD PROOF? STUDENTS EVALUATING AND PROVIDING
FEEDBACK ON STUDENT-GENERATED "PROOFS"**

Yosuke **Tsujiyama*** (1), Koki **Yui** (2)

(1: Keiai University; 2: Shioda Junior High School)

**USE OF EXAMPLES OF UNSUCCESSFUL ARGUMENTS TO FACILITATE STUDENTS'
REFLECTION ON THEIR PROVING PROCESSES**

Shiv Smith **Karunakaran***
(Washington State University)

**ALLOWANCE BY EXPERTS FOR A BREAK IN "LINEARITY" OF DEDUCTIVE LOGIC
IN THE PROCESS OF PROVING**

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall B

Session Chairs: Andreas **Stylianides**, Guershon **Harel**

Presentations: Eric **Knuth*** (1), Amy **Ellis** (1), Orit **Zaslavsky** (2)
(1: University of Wisconsin; 2: New York University)

THE ROLE OF EXAMPLES IN PROVING RELATED ACTIVITIES

David A. **Reid** (1), Estela Aurora Vallejo **Vargas*** (2)
(1: University of Bremen; 2: Pontifical Catholic University of Peru)

WHEN IS A GENERIC ARGUMENT A PROOF?

Orly **Buchbinder***
(University of New Hampshire)

**SYSTEMATIC EXPLORATION OF EXAMPLES AS PROOF:
ANALYSIS FROM FOUR THEORETICAL PERSPECTIVES**

TSG 19 – Problem solving in mathematics education

Co-chairs: Peter **Liljedahl** (Canada), Manuel Santos **Trigo** (Mexico)

Team members: Uldarico **Malaspina** (Peru), Guido **Pinkernell** (Germany), Laurent **Vivier** (France)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3136/3142

Session Chairs: Peter **Liljedahl**, Manuel **Santos**

Presentations: Wes **Maciejewski***, Bill **Barton**
(University of Auckland)

A FRAMEWORK FOR UNDERGRADUATE STUDENTS' MATHEMATICAL FORESIGHT

Hartono **Tjoe***

(The Pennsylvania State University)

LOOKING BACK TO SOLVE DIFFERENTLY: FAMILIARITY, FLUENCY, AND FLEXIBILITY

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3136/3142

Session Chair: Manuel **Santos**

Presentations: Peter **Liljedahl***
(Simon Fraser University)

CLASSROOM PRACTICES FOR SUPPORTING PROBLEM SOLVING

Aoife Marie **Guerin***, Olivia **Fitzmaurice**, John **O'Donoghue**
(University of Limerick)

PRE SERVICE TEACHERS' PROBLEM SOLVING ABILITY IN SECONDARY LEVEL

Katalin **Gosztonyi***

(University of Szeged (Hungary) and University Paris Diderot (France))

PROBLEM SOLVING IN VARGA'S REFORM OF HUNGARIAN MATHEMATICS EDUCATION:
THE CASE OF COMBINATORICS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3136/3142

Group A – Session Chair: Peter **Liljedahl**

Presentations: Maud **Chanudet***
(Université de Genève)

ASSESSING IBME WITH SUMMATIVE AND FORMATIVE PURPOSE

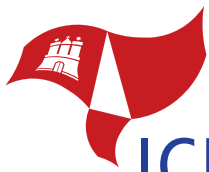
Pietro **Di Martino**, Giulia **Signorini***
(University of Pisa)

BEYOND THE STANDARDIZED ASSESSMENT OF PROBLEM SOLVING FROM PRODUCTS
TO PROCESSES

James A. Mendoza **Epperson***, Kathryn **Rhoads**, R. Cavender **Campbell**
(The University of Texas at Arlington)

TOWARD DEVELOPING AN INSTRUMENT TO ASSESS MATHEMATICAL
PROBLEM SOLVING





Location: E: mint, Economical Building, room 4098

Group B – Session Chair: Guido **Pinkernell**

Presentations: Carlos **Torres***, Uldarico **Malaspina**, Norma **Rubio**
(Pontificia Universidad Católica del Perú)

A PROPOSAL TO STIMULATE IN-SERVICE TEACHERS' COMPETENCE
OF DIDACTIC ANALYSIS BY MEANS OF PROBLEM POSING

Nina **Sturm***, Renate **Rasch**, Wolfgang **Schnotz**
(University of Koblenz-Landau)

DO HIGH- & LOW-ACHIEVING THIRDGRADERS BENEFIT IN THE SAME WAY FROM
REPRESENTATIONAL TRAINING WHEN SOLVING WORD PROBLEMS?
MATHEMATICS (ALGEBRA AND NUMBER)

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3136/3142

Session Chairs: Peter **Liljedahl**, Manuel **Santos**

Presentations: Hélia **Jacinto** (1,2), Susana **Carreira*** (2,3)

(1: Jorge Peixinho Secondary School; 2: UIDEF, University of Lisbon; 3: University of Algarve)
MATHEMATICAL PROBLEM SOLVING WITH TECHNOLOGY:
THE CASE OF MARCO SOLVING-AND-EXPRESSING ON THE SCREEN

Nélia **Amado*** (1,2), Susana **Carreira** (1,2), Sandra **Nobre** (2,3)

(1: University of Algarve; 2: Research Unit of the Institute of Education;
3: Group of Schools Paula Nogueira)

THE SPREADSHEET AFFORDANCES IN SOLVING INTRICATE ALGEBRAIC PROBLEMS

TSG 20 – Visualisation in the teaching and learning of mathematics

Co-chairs: Ferdinand **Rivera** (USA), Michal **Yerushalmy** (Israel)

Team members: Boon Liang **Chua** (Singapore), Elke **Söbbeke** (Germany), Isabel **Vale** (Portugal)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3016

Session Chair: Michal **Yerushalmy**

Presentations: Joachim **Frans***

(Free University Brussels)

THE EXPLANATORY VALUE OF MATHEMATICAL VISUALISATIONS:
A PHILOSOPHICAL AND PRAGMATIC APPROACH

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3016

Group A – Session Chair: Michal **Yerushalmy**

Presentations: Amy **Lin***

(Brock University)

GO FIGURE: CAN ACTIONS PROMOTE VISUAL AND SPATIAL REASONING?

Topic Study Groups

TSG

Natthapoj Vincent **Trakulphadetkrai***
(Institute of Education)

ENHANCING CHILDREN'S VISUALISATION OF MULTIPLICATION THROUGH THEIR
SELF-GENERATED MATHEMATICS PICTURE BOOKS

Location: E: mint, Economical Building, room 3017

Group B – Session Chair: Boon Liang **Chua**

Presentations: Isabel **Vale**, Teresa **Pimentel***, Ana **Barbosa**
(School of Education of the Polytechnic Institute of Viana do Castelo)
SEEING: AN INTUITIVE AND CREATIVE WAY TO SOLVE A PROBLEM

Ana **Barbosa*** (1), Isabel **Vale** (2)
(1: School of Education of Viana do Castelo; 2: School of Education of Viana do Castelo)
VISUAL PATTERNS: A CREATIVE PATH TO GENERALIZATION

Carolina Andrea Henríquez **Rivas***
(Universidad de La Frontera)
THE ROLE OF VISUALIZATION IN THE MATHEMATICAL WORKING SPACE OF TEACHERS:
DIFFERENTIATION OF REASONING

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3016

Group A – Session Chair: Isabel **Vale**

Presentations: Katia Vigo **Ingar*** (1), Maria Jose Ferreira **da Silva** (2)
(1: PUCP; 2: PUCSP)
APPREHENSIONS IN THE GRAPHIC REGISTER OF TWO VARIABLES FUNCTIONS

Jonatan **Muzangwa*** (1), Ugorjio **Ogbonnaya** (2), David **Mogari** (3)
(1: Great Zimbabwe University; 2: Tshwane University of Technology; 3: University of South Africa)
ANALYZING STUDENTS' VISUAL THINKING IN SOLVING SELECTED CONCEPTS OF
MATHEMATICAL ANALYSIS INVOLVING THE CONCEPT OF INFINITY

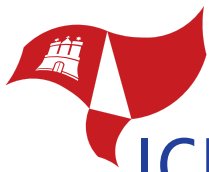
Mikaël **Mayer***, Lucas **Willems**
(EPFL)
REFLEX: AN EDUCATIONAL REPRESENTATION OF COMPLEX FUNCTIONS

Location: E: mint, Economical Building, room 3017

Group B – Session Chair: Boon Liang **Chua**

Presentations: Rabih Raif El **Mouhayar***
(American University of Beirut)
THE RELATIONSHIP BETWEEN TEACHER LENS AND TEACHER NOTICING OF STUDENTS'
STRATEGIES IN FIGURAL PATTERNS





TSG

Nazan Sezen **Yüksel***, Ali **Bülbül**
(HACETTEPE UNIVERSITY)

INVESTIGATION OF DEVELOPMENT ON MENTAL CUTTING ABILITY BY LATENT GROWTH MODEL

Ulrike **Dreher***, Timo **Leuders**, Lars **Holzäpfel**
(University of Education Freiburg)

FACTORS THAT INFLUENCE REPRESENTATIONAL CHOICE: STUDENTS' MATHEMATICAL ABILITIES, SELF-EFFICACY AND PREFERENCE

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 3016

Session Chairs: Boon Liang **Chua**, Isabel **Vale**

Presentations: Johanna Hendrina **Kotze***, Gerrie J. **Jacobs**, Erica D. **Spangenberg**
(University of Johannesburg)

ELICITING VISUALISATION WITH TECHNO-MODELLING TASKS

Juan D. **Godino** (1), Belén **Giacomone*** (1), Miguel R. **Wilhelmi** (2), Teresa F. **Blanco** (3),
Angel **Contreras** (4)

(1: University of Granada; 2: Public University of Navarra; 3: University of Santiago de Compostela;
4: University of Jaén)

ONTO-SEMIOTIC ANALYSIS OF VISUALIZATION AND DIAGRAMMATIC REASONING TASKS

TSG 21 – Mathematical applications and modelling in the teaching and learning of mathematics

Co-chairs: Jussara **Araújo** (Brazil), Gloria **Stillman** (Australia)

Team members: Morten **Blomhøj** (Denmark), Dominik **Leiss** (Germany), Toshikazu **Ikeda** (Japan)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall J

Session Chair: Jussara **Araújo**

Presentations: Gloria Ann **Stillman***
(Australian Catholic University)

STATE OF THE ART ON MODELLING IN MATHEMATICS EDUCATION

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall J

Group A – Session Chair: Morten **Blomhøj**

Presentations: France **Caron*** (1), Miroslav **Lovric** (2)
(1: Université de Montréal; 2: McMaster University)

APPROACHES TO INVESTIGATING COMPLEX DYNAMICAL SYSTEMS

Ibtisam Abedelhalek **Zubi**, Irit **Peled***
(University of Haifa)

SHIFTS IN KNOWLEDGE AND PARTICIPATION OF CHILDREN WITH MATHEMATICAL DIFFICULTIES WORKING ON MODELLING TASKS

Dung **Tran***, Phuong **Ta**, An **Nguyen**, Duyen **Nguyen**, Giang **Nguyen**
(Hue University College of Education)

AUTHENTICITY OF MODELLING TASKS AND STUDENTS' PROBLEM SOLVING

Miriam **Ortega*** (1), Lluís **Albarracín** (2), Luis **Puig** (1)
(1: Universitat de València; 2: Universitat Autònoma de Barcelona)

INFLUENCE OF TECHNOLOGY ON MATHEMATICAL MODELLING OF A PHYSICAL PHENOMENON

Location: C: turquoise, Main Building, lecture hall M

Group B – Session Chair: Toshikazu **Ikeda**

Presentations: Takashi **Kawakami*** (1), Janeen **Lamb** (2), Akio **Matsuzaki** (3), Akihiko **Saeki** (4)
(1: Nishikyushu University; 2: Australian Catholic University; 3: Saitama University;
4: Naruto University of Education)

MERGING OF TASK CONTEXTS AND MATHEMATICS IN DUAL MODELLING TEACHING: CASE STUDIES IN JAPAN AND AUSTRALIA

Jill P. **Brown***

(Australian Catholic University)

WHAT DO WE MEAN BY 'CONTEXT'?

Andreas **Busse***

(Universität Hamburg)

THE NEGATIVE IMPACT OF THE NEW GERMAN EXAMINATION TASKS ON THE MODELLING CLASSROOM IN HAMBURG

Corinna **Hertleif***, Catharina **Adamek**, Gilbert **Greefrath**
(WWU Münster)

ASSESSING SUB-COMPETENCIES OF MATHEMATICAL MODELLING IN THE LIMO PROJECT

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall J

Group A – Session Chair: Dominik **Leiss**

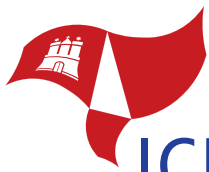
Presentations: Xenia-Rosemarie **Reit***
(Goethe-University Frankfurt)

THE POTENTIAL OF COGNITIVE STRUCTURES IN SOLUTION APPROACHES OF MODELLING TASKS

Jennifer Ann **Czocher***
(Texas State University)

MAKING SENSE OF STUDENT-GENERATED CONDITIONS AND ASSUMPTIONS





TSG

Angeles **Dominguez***, Jorge Eugenio **de la Garza Becerra**
(Tecnologico de Monterrey)

MODEL APPLICATION ACTIVITY: INTEGRATION OF CONCEPTS AND MODELS

Toshikazu **Ikeda***

(Yokohama National University)

ORGANIZING MATHEMATICAL MODELLING IN JAPANESE MATHEMATICS CURRICULUM

Location: C: turquoise, Main Building, lecture hall M

Group B – Session Chairs: Jill P. **Brown**

Presentations: Juhaina Awawdeh **Shahbari*** (1,2), Michal **Tabach** (1)

(1: Tel-Aviv University; 2: Al-Qasemi Academy)

ADAPTING A COGNITIVE TOOL FOR REPRESENTING TEACHERS' INTERPRETATIONS
OF STUDENTS' MODELLING ACTIVITIES

Peter **Stender***

(Universität Hamburg)

HEURISTIC STRAGIES IN MODELING PROBLEMS

Elizabeth W. **Fulton***, Megan H. **Wickstrom**, Elizabeth A. **Burroughs**, Mary Alice **Carlson**
(Montana State University)

TEACHERS AS LEARNERS: UNDERSTANDING AND VALUING MATHEMATICAL
MODELING THROUGH PROFESSIONAL DEVELOPMENT

Joo Young **Park***

(Florida Institute of Technology)

PRE-SERVICE MATHEMATICS TEACHERS PROJECT-BASED MATHEMATICAL
MODELING INSTRUCTION: CONCEPTON, TASK DESIGN, AND ENACTMENT

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall J

Session Chair: Gloria Ann **Stillman**

Presentations: Jussara **Araújo***

(Universidade Federal de Minas Gerais)

TOWARD A FRAMEWORK FOR A DIALECTICAL RELATIONSHIP BETWEEN
PEDAGOGICAL PRACTICE AND RESEARCH

Morten **Blomhoj***

(Roskilde University)

INTERPLAY BETWEEN RESEARCH AND DEVELOPMENT OF TEACHING PRACTICES
IN MATHEMATICAL MODELLING

TSG 22 – Interdisciplinary mathematics education

Co-chairs: Susie **Groves** (Australia), Julian **Williams** (UK)

Team members: Rita Borrromeo **Ferri** (Germany), Brian **Doig** (Australia), Nicholas **Mousoulides** (Cyprus)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 0029

Session Chair: Susie **Groves**

Presentations: Julian **Williams*** (1), Wolff-Michael **Roth** (2)

(1: University of Manchester; 2: University of Victoria)

THEORY OF DISCIPLINARITY AND INTERDISCIPLINARY ACTIVITY:
COMMUNITIES, BOUNDARIES, VOICES AND HYBRIDITY

Russell William **Tytler***

(Deakin University)

CHALLENGES FOR MATHEMATICS WITHIN AN INTERDISCIPLINARY STEM EDUCATION

Brian **Doig***, Wendy **Jobling**

(Deakin University)

INTER-DISCIPLINARY MATHEMATICS: OLD WINE IN NEW BOTTLES?

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 0029

Session Chair: Rita **Borrromeo-Ferri**

Presentations: Nicholas **Mousoulides***

(University of Nicosia)

A MODELLING PERSPECTIVE IN DESIGNING INTERDISCIPLINARY PROFESSIONAL
LEARNING COMMUNITIES

Nelleke Sussanna **den Braber*** (1), Jenneke **Krüger** (2), Marco **Mazereeuw** (1), Wilmad **Kuiper** (2)

(1: NHL University of Applied Sciences; 2: Freudenthal Institute)

MATHEMATICS IN AN INTERDISCIPLINARY STEM COURSE (NLT) IN THE NETHERLANDS

Fatma **Aslan-Tutak***, Sevil **Akaygun**

(Bogazici University)

PRESERVICE MATHEMATICS TEACHERS' INTERDISCIPLINARY WORK FOR STEM EDUCATION

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 0029

Session Chair: Nicholas **Mousoulides**

Presentations: Andrzej **Sokolowski***

(Lone Star System – Montgomery)

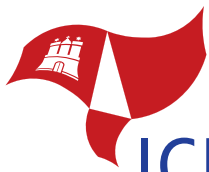
SCIENTIFIC INQUIRY IN MATHEMATICS AND STEM EDUCATION

Michael Erotoma **Omuvwie***

(University of Manchester)

USING REAL-LIFE CONTEXT AS AN AID FOR MATHEMATICS TEACHING AND LEARNING





Robert Lee **Mayes*** (1), Kent **Rittschof** (1), Jennifer **Forrester** (2), Jennifer **Christus** (3)
(1: Georgia Southern University; 2: University of Wyoming; 3: University of Wisconsin-Oshkosh)
QUANTITATIVE REASONING: RASCH MEASUREMENT TO SUPPORT QR ASSESSMENT

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 0029

Session Chair: Julian **Williams**

Presentations: Rita **Borromeo-Ferri*** (1), Andreas **Meister** (2), Detlef **Kuhl** (3), Astrid **Hülsmann** (4)
(1: University of Kassel; 2: University of Kassel; 3: University of Kassel; 4: Freelance Sculpture Artist)
INSPIRED BY LEONARDO DA VINCI – STEM LEARNING FOR PRIMARY AND SECONDARY SCHOOL WITH THE CROSS-LINK APPROACH

María Alicia Venegas **Thayer***
(Pontifical Catholic University of Valparaíso)
INTERDISCIPLINARY COLLABORATION BETWEEN MUSICIANS AND MATHEMATICIANS: AN EXPERIENCE WITH STOCHASTIC MUSIC

David **Swanson***
(The University of Manchester)
RATIO AND PROPORTION IN SECONDARY SCHOOL SCIENCE

TSG 23 – Mathematical literacy

Co-chairs: Iddo **Gal** (Israel), Hamsa **Venkat** (SA)

Team members: Vince **Geiger** (Australia), Eva **Jablonka** (UK), Markus **Helmerich** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 209

Session Chairs: Hamsa **Venkat**, Iddo **Gal**

Presentations: Vince **Geiger*** (1), Marilyn **Goos** (2), Helen **Forgasz** (3)
(1: Australian Catholic University; 2: The University of Queensland; 3: Monash University)
MATHEMATICAL LITERACY (NUMERACY) FROM AN INTERNATIONAL PERSPECTIVE

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 209

Session Chairs: Iddo **Gal**, Hamsa **Venkat**

Presentations: Eckhard **Klieme***
(German Institute for International Educational Research)
LEARNING ENVIRONMENTS FOR MATHEMATICAL LITERACY IN CROSS-CULTURAL COMPARISONS

Topic Study Groups

TSG

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 209

Group A – Session Chairs: Vince **Geiger**, Eva **Jablonka**

Presentations: Andreas **Vohns***

(Alpen-Adria-Universität Klagenfurt)

MATHEMATICAL LITERACY AS A CIVIL RIGHT AND/OR A CIVIC DUTY?
TWO GENERAL EDUCATION APPROACHES

Marc **North***

(University of Nottingham)

TOWARDS A THEORETICAL LANGUAGE OF DESCRIPTION OF THE KNOWLEDGE
DOMAIN OF MATHEMATICAL LITERACY: THE CASE OF SOUTH AFRICA

Joachim **Engel** (1), Iddo **Gal*** (2), Jim **Ridgway** (3)

(1: Ludwigsburg University of Education; 2: University of Haifa; 3: University of Durham)

MATHEMATICAL LITERACY AND CITIZEN ENGAGEMENT: THE ROLE OF CIVIC STATISTICS

Anne **Bennison***

(The University of Queensland)

BOUNDARY OBJECTS AND NUMERACY ACROSS THE CURRICULUM

Location: H: orange, Educational Building, room 08

Group B – Session Chair: Markus Alexander **Helmerich**

Presentations: Irene **Cazorla*** (1), Miriam **Utsumi** (2)

(1: Universidade Estadual de Santa Cruz – UESC; 2: Universidade de São Paulo – USP)

REFLECTIONS ON THE POTENTIAL OF TEACHING STATISTICS IN BASIC EDUCATION
FOR WORLD READING EXTENSION

Robabeh **Afkhami***, Nasim **Asghary**

(azad university)

EXAMINING MATHEMATICAL LITERACY OF IRANIAN ELEMENTARY STUDENTS

Mark **Winter***

(University of Johannesburg)

TRAVERSING THE INTERFACE BETWEEN CONTEXTUAL AND MATHEMATICAL WORLDS
IN TEACHER LEARNING FOR MATHEMATICAL LITERACY

Yun-Zu **Chen***

(National Taiwan Normal University)

CONCEPTUALIZING SPATIAL LITERACY FOR STEM EDUCATION

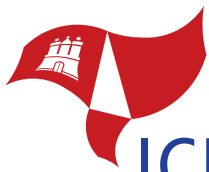
Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 209

Session Chairs: Iddo **Gal**, Hamsa **Venkat**

GENERAL REACTIONS & GENERAL DISCUSSION





TSG 24 – History of the teaching and learning of mathematics

Co-chairs: Fulvia **Furinghetti** (Italy), Alexander **Karp** (USA)

Team members: Henrike **Allmendinger** (Germany), Johan **Prytz** (Sweden), Harm Jan **Smid** (Netherlands)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 105

Session Chair: Alexander **Karp**

Presentations: Gert **Schubring***

(Universidade Federal do Rio de Janeiro)

PATTERNS FOR STUDYING HISTORY OF MATHEMATICS EDUCATION:
CASE STUDY OF GERMANY

Jenneke **Krüger***

(university of Utrecht)

FRANS VAN SCHOOTEN SR: DUTCH GEOMETRY FOR ENGINEERS, LEIDEN, 1611–1645

Antonio M. **Oller-Marcén*** (1), Vicente **Meavilla** (2)

(1: Centro Universitario de la Defensa de Zaragoza; 2: Universidad de Zaragoza)

ARITHMETIC IN SPANISH ARMY AT THE END OF XIX CENTURY.
THE WORKS BY SALINAS AND BENÍTEZ

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 105

Session Chair: Johan **Prytz**

Presentations: Marion **Cousin***

(University Paris 7/SPHERE Laboratory)

THE REVOLUTION OF MATHEMATICAL TEACHING DURING THE MEIJI ERA (1868 – 1912).

Alexander **Karp***

(Teachers College)

RUSSIAN MATHEMATICS TEACHERS, 1830–1880: SEVERAL EXAMPLES

Fulvia **Furinghetti***

(University of Genoa)

THE PROFESSIONALIZATION OF ITALIAN PRIMARY TEACHERS THROUGH
A JOURNAL ISSUED AT THE BEGINNING OF XX CENTURY

Harm Jan **Smid***

(Delft University of Technology)

BECOMING A TEACHER OF MATHEMATICS IN TIMES OF CHANGE

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 105

Session Chair: Harm Jan **Smid**

Presentations: Johan **Prytz***

(Uppsala universitet)

NEW MATH FOR BIG EDUCATION, OLD MATH FOR SMALL EDUCATION?
A STUDY OF DIFFERENT WAYS TO REFORM SCHOOL MATHEMATICS

Dirk **De Bock***, Geert **Vanpaemel**
(Katholieke Universiteit Leuven)

EARLY EXPERIMENTS WITH MODERN MATHEMATICS IN BELGIUM

Elisabete Zardo **Burigo***

(Universidade Federal do Rio Grande do Sul)

REAL NUMBERS IN SCHOOL: 1960S EXPERIMENTS

Miguel **Picado*** (1), Luis **Rico** (2), Bernardo **Gómez** (3)

(1: National University of Costa Rica; 2: University of Granada; 2: University of Granada;

3: University of Valencia)

THE METROLOGICAL REFORM IN THE SPANISH EDUCATIONAL SYSTEM IN THE
19TH CENTURY: WHO WERE THE AUTHORS OF THE TEXTBOOKS?

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 105

Session Chair: Fulvia **Furinghetti**

Presentations: Kristín **Bjarnadóttir***

(University of Iceland)

ROYAUMONT – PROPOSALS ON ARITHMETIC AND ALGEBRA TEACHING
FOR LOWER-SECONDARY SCHOOL LEVEL

Sethykar **SamAn***

(Royal University of Phnom Penh)

HISTORY OF MATHEMATICS INSTRUCTION IN COLONIAL CAMBODIA

Alexei K. **Volkov***

(National Tsing-Hua University)

DIDACTICAL FUNCTION OF IMAGES OF COUNTING DEVICES IN CHINESE
MATHEMATICAL TEXTBOOKS

Gabriella **Ambrus** (2), Andreas **Filler*** (1), Ödön **Vancsó** (2)

(1: Humboldt-Universität zu Berlin; 2: Eötvös Loránd University Budapest)

FUNCTIONAL REASONING AND WORKING WITH FUNCTIONS IN MATHEMATICS
TEACHING TRADITION IN HUNGARY AND GERMANY

TSG 25 – The Role of History of Mathematics in Mathematics Education

Co-chairs: Costas **Tzanakis** (Greece), Xiaoqin **Wang** (China)

Team members: Kathleen Clark (USA), Tinne Hoff Kjeldsen (Denmark), Sebastian Schorcht (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2091/2201

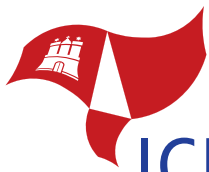
Session Chair: Constantinos **Tzanakis**

Presentations: Tinne Hoff **Kjeldsen**, Mikkel Willum **Johansen***

(University of Copenhagen)

THE HISTORY OF ARTIFACTS AS A RESOURCE IN MATHEMATICS EDUCATION





David **Guillemette***

(University of Ottawa)

AN EMPIRICAL STUDY CONCERNING LIVED EXPERIENCE OF PRESERVICE TEACHERS ENGAGED IN THE READING OF HISTORICAL TEXTS

Jerry M. **Lodder***

(New Mexico State University)

PRIMARY HISTORICAL SOURCES IN THE CLASSROOM: GRAPH THEORY AND SPANNING TREES

Snezana **Lawrence***

(Bath Spa University)

EUCLID'S ART AFTER BATH

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2091/2201

Session Chair: Kathy **Clark**

Presentations: Iolanda **Guevara-Casanova*** (1), Carme **Burgués-Flamarich** (2)

(1: Universitat Autònoma Barcelona; 2: Universitat Barcelona)

GEOMETRY AND VISUAL REASONING TO INTRODUCE ALGEBRAIC LANGUAGE AS LIU HUI AND AL-KHWARIZMI DID

Aline **Bernardes*** (1), Tatiana **Roque** (2)

(1: Federal University of the State of Rio de Janeiro (UNIRIO);

2: Federal University of Rio de Janeiro (UFRJ))

HISTORY OF MATRICES: PROMOTING COGNITIVE CONFLICTS AND ENCOURAGING REFLECTION ON META-DISCURSIVE RULES IN PROSPECTIVE TEACHERS

Sebastian **Schorcht***

(Primary School Kopernikusstrasse)

HISTORY OF MATHEMATICS IN TEXTBOOKS FROM FIRST TO SEVENTH GRADES – TYPES OF TASKS

Maria T. **Sanz***, Bernardo **Gómez**

(UNIVERSIDAD DE VALENCIA)

MISSING CURIOUS FRACTION PROBLEMS: THE UNKNOWN HERITAGE AND THE UNKNOWN NUMBERS OF HEIRS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2091/2201

Session Chair: Tinne Hoff **Kjeldsen**

Presentations: Patricia **Baggett*** (1), Andrzej **Ehrenfeucht** (2)

(1: New Mexico State University; 2: University of Colorado)

INVOLVING STUDENTS IN RESEARCH IN THE HISTORY OF MATHEMATICS EDUCATION: FROM BOOK REPORT TO MAJOR PROJECT

Kristian **Danielsen** (2), Emilie **Gertz** (1), Henrik Kragh **Sørensen*** (1)

(1: Aarhus University; 2: Randers Statskole)

FACILITATING AUTHENTIC HISTORY OF MATHEMATICS IN DANISH UPPER-SECONDARY MATHEMATICS EDUCATION

Topic Study Groups

TSG

Qian **Fang***

(East China Normal University)

INSTRUCTIONAL DESIGN OF BINOMIAL THEOREM FROM THE PERSPECTIVE OF HPM

Susanne **Spies***, Ingo **Witzke**

(Universität Siegen)

MAKING DOMAINSPECIFIC BELIEFS EXPLICIT FOR PROSPECTIVE TEACHERS –
AN EXAMPLE OF USING ORIGINAL SOURCES

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2091/2201

Session Chair: Xiaoqin **Wang**

Presentations: Ingo **Witzke** (1), Kathleen **Clark*** (2), Horst **Struve** (3), Gero **Stoffels** (1)

(1: University of Siegen; 2: Florida State University; 3: University of Cologne)

A SEMINAR DESIGNED TO ADDRESS THE TRANSITION PROBLEM FROM SCHOOL
TO UNIVERSITY MATHEMATICS: INITIAL RESULTS

Silvia **Schöneburg***

(University of Leipzig)

THE PANTOGRAPH – A HISTORICAL DRAWING DEVICE FOR MATH TEACHING

Ysette **Weiss-Pidstrygach*** (1), Rainer **Kaenders** (2)

(1: Johannes Gutenberg – Universität Mainz; 2: Rheinische Friedrich-Wilhelms-Universität Bonn)

ALGEBRA WITHOUT CONTEXT IS EMPTY, VISUALIZATIONS WITHOUT
CONCEPTS ARE BLIND

Vasiliki **Tsiapou***

(University of Western Macedonia)

LIU HUI SHARES HIS VIEWS ABOUT MATHEMATICS WITH STUDENTS OF
A GREEK PRIMARY SCHOOL

TSG 26 – Research on teaching and classroom practice

Co-chairs: Yoshinori **Shimizu** (Japan), Mary Kay **Stein** (USA)

Team members: Birgit **Brandt** (Germany), Helia **Oliveira** (Portugal), Lijun **Ye** (China)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, lecture hall

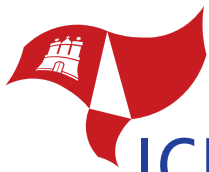
Session Chairs: Mary Kay **Stein**, Yoshinori **Shimizu**

Presentations: Daniel **Chazan*** (1), Patricio **Herbst** (2)

(1: University of Maryland; 2: University of Michigan)

RECONCILING TWO USES OF NORM IN MATHEMATICS EDUCATION RESEARCH





Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, lecture hall

Group A – Session Chair: Birgit Brandt

Presentations: Esther Alice **Enright***, Lauren Ashley **Hickman**, Deborah Loewenberg **Ball**
(University of Michigan)

A TYPOLOGY OF QUESTIONS BY INSTRUCTIONAL FUNCTION

Melissa Kemmerle*

(University of Michigan)

QUESTIONS ABOUT QUESTIONS

Siún NicMhuirí*

(Dublin City University)

USING RESEARCH FRAMEWORKS TO DEVELOP PRACTICE:
TEACHER QUESTIONS IN A MATH TALK COMMUNITY

Location: B: dark-brown, East Wing Building, room 123

Group B – Session Chair: Helia Oliveira

Presentations: Jeremy **Zelkowski***, Jim **Gleason**, Stefanie D. **Livers**
(The University of Alabama)

MEASURING MATHEMATICS CLASSROOM INTERACTIONS: OBSERVATION PROTOCOL
REINFORCING DEVELOPMENT OF CONCEPTUAL UNDERSTANDING

Lidong **Wang***, Yiming **Cao**

(The High School Affiliated to RENMIN University of China)

USING COGNITIVE DIAGNOSTIC MODEL TO BUILD A DIFF. MODEL MEASURING
MATH TEACHERS' EFFECT ON GRADE 7 STUDENTS' ACHIEVEMENT

Steven **Watson*** (1), Louis **Major** (1), Elizabeth **Kimber** (2)

(1: Faculty of Education; 2: Faculty of Mathematics)

TEACHER CHANGE IN POST-16 MATHEMATICS:
A MULTIPLE CASE ANALYSIS OF TEACHERS IN THE ZONE OF ENACTMENT

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, lecture hall

Group A – Session Chair: Liyun Ye

Presentations: Marika **Toivola***, Harry **Silfverberg**
(University of Turku)

THE ESPOUSED THEORY OF ACTION OF AN EXPERT MATHEMATICS TEACHER
USING FLIPPED LEARNING

Amanda **Allan***, Tina **Rapke**, Lyndon **Martin**

(York University)

SETTING ASIDE: HOW TEACHERS CAN SUPPORT STUDENTS TO BUILD ON
PRIOR KNOWLEDGE

Topic Study Groups

TSG

Location: B: dark-brown, East Wing Building, room 123

Group B – Session Chair: Yoshinori **Shimizu**

Presentations: Emily C. **Kern*** (1), Erin C. **Henrick** (1), Thomas M. **Smith** (2), Paul **Cobb** (1), Yiming **Cao** (3)

(1: Vanderbilt University; 2: University of California-Riverside; 3: Beijing Normal University)

ANALYZING MIDDLE GRADES MATHEMATICS TEACHING IN THE U.S. AND CHINA:
A CROSS-NATIONAL COMPARISON OF INSTRUCTIONAL QUALITY

Sharon Marianne **Calor***, Rijkje **Dekker**, Jannet Petronella **van Drie**, Bonne **Zijlstra**, Monique **Volman**
(University of Amsterdam)

COMPARISON OF MATHEMATICS DISCUSSION AND CONVENTIONAL LESSONS
IN A COLLABORATIVE SETTING

Yu Bin **Lee***, Cheong Soo **Cho**

(Shin Jung High School)

STUDY OF REPRESENTATIONAL PRACTICES AND REPRESENTATIONAL ACTIVITIES
OF SEC. MATH TEACHERS THROUGH ETHNOGRAPHIC STUDY

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, lecture hall

Session Chairs: Yoshinori **Shimizu**, Mary Kay **Stein**

Presentations: Mary Kay **Stein***, Katelynn **Kelly**, Debra **Moore**, Richard **Correnti**, Jennifer **Russell**
(University of Pittsburgh)

THEORIZING AND MEASURING TEACHING FOR CONCEPTUAL UNDERSTANDING

Yoshinori **Shimizu*** (1), Yuka **Funahashi** (2)

(1: University of Tsukuba; 2: Nara University of Education)

BEYOND THE LABELS: LEARNING FROM INTERNATIONAL COMPARATIVE STUDIES
OF MATHEMATICS CLASSROOM PRACTICES

TSG 27 – Learning and cognition in mathematics

Co-chairs: Wim **van Dooren** (Belgium), Gaye **Williams** (Australia)

Team members: Pablo **Dartnell** (Chile), Anke **Lindmeier** (Germany), Jérôme **Proulx** (Canada)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 208

Session Chair: Wim **van Dooren**

Presentations: Erno **Lehtinen***

(University of Turku)

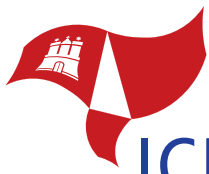
MATHEMATICAL COGNITION AND LEARNING PROCESSES:
ANALYSIS OF INDIVIDUAL LEARNING TRAJECTORIES

Jo **Van Hoof***, Lieven **Verschaffel**, Wim **Van Dooren**

(KU Leuven)

CHARACTERIZING THE DEVELOPMENT OF THE NATURAL NUMBER BIAS
THROUGH PRIMARY AND SECONDARY EDUCATION





David Maximiliano **Gomez***, Pablo **Dartnell**
(Universidad de Chile)

CLUSTERING ANALYSIS AS A WINDOW INTO CHILDREN'S STRATEGIES FOR COMPARING FRACTIONS

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 208

Session Chair: Gaye **Williams**

Presentations: Dor **Abrahamson***
(University of California)

THE ECOLOGICAL DYNAMICS OF MATHEMATICS EDUCATION:
THE EMERGENCE OF PROPORTIONAL REASONING IN FIELDS OF PROMOTED ACTION

Anke **Lindmeier***, Aiso **Heinze**
(IPN Kiel)

STRATEGIES FOR RECOGNIZING QUANTITIES IN STRUCTURED WHOLE NUMBER REPRESENTATIONS – A COMPARATIVE EYE-TRACKING STUDY

Tine **Degrande***, Lieven **Verschaffel**, Wim **Van Dooren**
(Centre for Instructional Psychology and Technology)

RECONSIDERING SFOR: CHARACTERIZING CHILDREN'S FOCUS ON QUANTITATIVE RELATIONS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 208

Session Chair: Wim **Van Dooren**

Presentations: Judy Anne **Anderson*** (1), Janette **Bobis** (1), Andrew **Martin** (2), Karen **Skilling** (3), Jenni **Way** (1)

(1: The University of Sydney; 2: The University of New South Wales; 3: Kings College London)
THE MIDDLE YEARS TRANSITION, ENGAGEMENT AND ACHIEVEMENT IN MATHEMATICS (MYTEAM) PROJECT

Miguel Alves **Figueiredo***, Henrique Manuel **Guimarães**
(Instituto de Educação – Universidade de Lisboa)

LEARNING STYLES IN MATHEMATICS OF 10TH GRADE PORTUGUESE STUDENTS

Bishnu **Khanal***
(Mahendra Ratna Campus)

STUDENTS' LEARNING STRATEGIES IN MATHEMATICS

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 208

Session Chair: Gaye **Williams**

Presentations: Minoru **Ohtani***
(Kanazawa University)

ITC BASED DISCOURSE THAT AFFECTS REIFICATION OF A MATHEMATICAL OBJECT:
THE CASE OF FUNCTION

Topic Study Groups

TSG

P Janelle **McFeetors***

(University of Alberta)

AUTHORING AS A METAPHOR FOR LEARNING IN MATHEMATICS

Gaye **Williams***

(Deakin University (Burwood Campus))

INFLUENCES OF DIFFERENT PACES OF THINKING ON GROUP LEARNING
IN THE ZONE OF PROXIMAL DEVELOPMENT

TSG 28 – Affect, beliefs and identity in mathematics education

Co-chairs: Markku **Hannula** (Finland), Francesca **Morselli** (Italy)

Team members: Emine **Erktin** (Turkey), Maike **Vollstedt** (Germany), Qiao-Ping **Zhang** (Hong Kong)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall C

Session Chair: Francesca **Morselli**

Presentations: Gilah **Leder***

(Monash University)

MATHEMATICS-RELATED BELIEFS AND AFFECT – WITH SPECIAL EMPHASIS ON GENDER:
AN OVERVIEW

Emmanuel Adu-tutu **Bofah***, Markku S **Hannula**

(University of Helsinki)

PERCEIVED SOCIAL SUPPORT AND ACHIEVEMENT: THE MEDIATIONAL ROLE OF
MOTIVATIONAL BELIEFS

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall C

Group A – Session Chair: Qiao-Ping Zhang

Presentations: Einat **Heyd-Metzuyanım***

(Technion – Israel Institute of Technology)

IDENTITY AS A NEXUS OF AFFECT AND DISCOURSE IN MATHEMATICAL LEARNING

Lise **Westaway***

(Rhodes University)

SOCIAL REALISM: A FRAMEWORK FOR RESEARCHING THE EMERGENCE OF
TEACHERS' IDENTITIES

Clyde Benedict Aurelius **Felix***

(Nelson Mandela Metropolitan University)

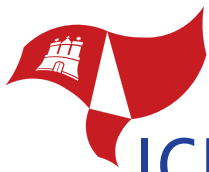
THE STRUGGLE FOR RECOGNITION AND THE PROFESSIONAL IDENTITIES OF
MATHEMATICS TEACHERS

Andreas **Karaolis***, George **Filippou**

(University of Nicosia)

TEACHERS' PROFESSIONAL IDENTITY





Location: C: turquoise, Main Building, lecture hall H

Group B – Session Chair: Maike Vollstedt

Presentations: Zehavit **Kohen*** (1,2), Tali **Miranda** (2)
(1: Bar-Ilan University; 2: Levinsky College of Education)

SELF-EFFICACY IN LEARNING MATHEMATICS: THE EFFECT OF VISUALIZATION AND ITS MUTUAL RELATION TO STUDENTS' ACHIEVEMENTS

Edgar **Fuller***, Jessica **Deshler**
(West Virginia University)

THE IMPACT OF ANXIETY AND PERSONALITY ON STUDENT PERFORMANCE IN DEVELOPMENTAL MATHEMATICS COURSES

Çigdem **Haser***
(Middle East Technical University)

FEELINGS OF DIFFICULTY DURING PROBLEM POSING AND SOLVING

Markku S. **Hannula***, Susanna **Oksanen**
(University of Helsinki)

THE EFFECT OF TEACHER BELIEFS ON STUDENT AFFECT AND ACHIEVEMENT

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall C

Group A – Session Chair: Emine **Erktin**

Presentations: Deena **Khalil***, Ayanna **Johnson**
(Howard University)

A NOVICE TEACHER'S POWERFUL MATHEMATICAL AFFECT:
A CASE STUDY OF MYKIA'S TEACHLIVE™ REHEARSALS

Christin **Laschke*** (1), Sigrid **Blömeke** (2)
(1: Humboldt-Universität zu Berlin; 2: University of Oslo)

THE MEASUREMENT OF MOTIVES TO BECOME A TEACHER IN TEDS-M – TESTING FOR INVARIANCE ACROSS COUNTRIES AND CULTURES

Atinuke **Adeyemi***
(University of Windsor)

MATHEMATICS ANXIETY AND MATHEMATICS TEACHING ANXIETY AMONG IN-SERVICE ELEMENTARY SCHOOL TEACHERS

Sylvester **Juwe***
(University of Cambridge)

A COMPARISON OF MATHEMATICS EDUCATION BELIEFS AMONG MATHEMATICS CURRICULUM LEADERS IN ENGLAND AND NIGERIA

Location: C: turquoise, Main Building, lecture hall H

Group B – Session Chair: Birgit **Pepin**

Presentations: Elizar **Elizar***
(The University of Adelaide)

TWO-LEVEL MODEL OF ATTITUDES AND BELIEFS INFLUENCING HIGHER ORDER THINKING (HOT) SKILLS IN MATHEMATICS

Topic Study Groups

TSG

Ozge **Gun*** (1), Safure **Bulut** (2)

(1: Bartin University; 2: Middle East Technical University)

STUDENTS' ATTITUDES TOWARD MATHEMATICS: A MODELING STUDY

Francesca Morselli* (1), Laura Branchetti (2)

(1: University of Genova; 2: University of Palermo)

THE INTERPLAY OF RATIONALITY AND IDENTITY IN A MATHEMATICAL ACTIVITY
IN SECONDARY SCHOOL

Karina Joyce **Wilkie***

(Monash University)

EXPLORING STUDENTS' OWN EXPRESSIONS OF THEIR ASPIRATIONS FOR
MATHEMATICS LEARNING

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall C

Session Chair: Markku S. **Hannula**

Presentations: Barbara **Pieronkiewicz*** (1), Gerald **Goldin** (2)

(1: Pedagogical University of Cracow; 2: Rutgers University)

AFFECTIVE TRANSGRESSION AND META-AFFECT:
AN EXPLORATION OF PROCESSES FOR BELIEF CHANGE IN MATHEMATICS EDUCATION

James A Middleton*, Daniel **Mangu**, Andrew **Lee**

(Arizona State University)

A LONGITUDINAL STUDY OF MATHEMATICS AND SCIENCE MOTIVATION PATTERNS
FOR STEM-INTENDING HIGH SCHOOLERS IN THE US

Kay **Achmetli***, Stanislaw **Schukajlow**

(Westfälische Wilhelms-Universität Münster)

MULTIPLE SOLUTIONS, THE EXPERIENCE OF COMPETENCE, AND INTEREST

TSG 29 – Mathematics and creativity

Co-chairs: Dace **Kuma** (Latvia), Demetra **Pitta-Pantazi** (Cyprus)

Team members: Alex **Friedlander** (Israel), Thorsten **Fritzlar** (Germany), Emiliya **Velikova** (Bulgaria)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 205

Session Chairs: Dace **Kuma**, Demetra **Pitta-Pantazi**

Presentations: Gulden **Karakok*** (1), Houssein **El Turkey** (2), Milos **Savic** (3), Gail **Tang** (4),

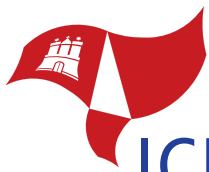
Emilie **Naccarato** (1), David **Plaxco** (3)

(1: University of Northern Colorado; 2: University of New Haven; 3: University of Oklahoma;

4: University of La Verne)

CREATIVITY-IN-PROGRESS RUBRIC ON PROVING – ENHANCING STUDENTS CREATIVITY





Julia Joklitschke* (1), Benjamin **Rott** (1), Maike **Schindler** (2)
(1: University of Duisburg-Essen; 2: Örebro University)

REVISITING THE IDENTIFICATION OF MATHEMATICAL CREATIVITY:
VALIDITY CONCERNS REGARDING THE CORRECTNESS OF SOLUTIONS

Demetra **Pitta-Pantazi***, Paraskevi **Sophocleous**
(University of Cyprus)

HIGHER ORDER THINKING IN MATHEMATICS: A THEORETICAL FORMULATION
AND ITS EMPIRICAL VALIDATION

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 205

Session Chair: Alex **Friedlander**

Presentations: Alex **Friedlander***
(Weizmann Institute of Science)

SOME TYPES OF CREATIVITY-PROMOTING TASKS

Jyoti **Sharma***

(University of Delhi)

EFFECT OF MATHEMATICS LEARNING ON THE DEVELOPMENT OF
MATHEMATICS CREATIVITY

Ingrid **Semanišínová*** (1), Martina **Jesenská** (2)

(1: Faculty of Science; 2: Giles Academy)

DEVELOPING FLEXIBILITY OF PROBLEM SOLVING STRATEGIES IN THE CLASSROOM

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 205

Session Chair: Torsten **Fritzlar**

Presentations: Lillie R. **Albert***
(Boston College)

THE NEXT GENERATION OF ELEMENTARY MATHEMATICS TEACHERS:
THE ROLE OF PERSONALITY AND CREATIVITY

Jarmila **Novotná*** (2), Hana **Moraová** (1)

(1: Charles University in Prague; 2: Charles University in Prague)

ORNAMENTS AND TESSALATIONS – ENCOURAGING CREATIVITY IN
MATHEMATICS CLASSROOM

Daniela Assmus, Torsten **Fritzlar***

(University of Halle-Wittenberg)

MATHEMATICAL CREATIVITY IN PRIMARY GRADES

Nour **Al-Sharif***, Sahar **Khanafer**, Amine **El-Sahili**

(Lebanese University)

MATHEMATICAL CREATIVITY: THE UNEXPECTED LINKS

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 205

Session Chair: Emiliya **Velikova**

Presentations: Romualdas **Kašuba***

(Vilnius University Lithuania)

REMARKS ON CREATIVE POSING OF PROBLEMS – PRO ET CONTRA

Paraskevi **Sophocleous***

(University of Cyprus)

MATHEMATICAL PROBLEM-POSING ABILITY AND CRITICAL THINKING IN MATHEMATICS

Wajeeh **Daher*** (1,2), Ahlam **Anabousy** (1,3)

(1: Al-Qasemi Academic College of Education; 2: An-Najah National University; 3: Tel-Aviv University)

FLEXIBILITY OF PRE-SERVICES TEACHERS IN PROBLEM POSING IN DIFFERENT ENVIRONMENTS

TSG 30 – Mathematical competitions

Co-chairs: Maria **Falk de Losada** (Colombia), Alexander **Soifer** (USA)

Team members: Christian **Reiher** (Germany), Jaroslav **Svrcek** (Czech Republic), Peter **Taylor** (Australia)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 424

Session Chair: Mary **Falk de Losada**, Alexander **Soifer**

Presentations: Alexander **Soifer***

(University of Colorado at Colorado Springs)

BEYOND LAOZ : THE GOALS OF MATHEMATICS INSTRUCTION

Iliana Ivanova **Tsvetkova***

(Sofia High School of Mathematics)

MATHEMATICS COMPETITIONS AS A TOOL FOR DEVELOPMENT OF GIFTED STUDENTS

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 424

Session Chairs: Mary **Falk de Losada**, Alexander **Soifer**

Presentations: Mary **Falk de Losada***

(Universidad Antonio Narino)

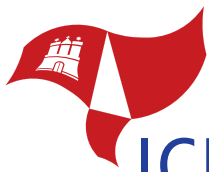
ARE MATHEMATICS COMPETITIONS CHANGING MATHEMATICS?

Donglin Ms. **Chen***, Frederick K.S. **Leung**

(Faculty of Education)

CHINA MATHEMATICAL OLYMPIAD SCHOOL: A CASE STUDY





Third Session: Friday, 29 July 2016, 12.00 – 13.30
Location: H: orange, Educational Building, room 424
Session Chairs: Mary **Falk de Losada**, Alexander **Soifer**

Presentations: Peter **Taylor***
(University of Canberra)
SOME REFLECTIONS, SOME SUGGESTIONS

Luis F. Caceres **Duque*** (1), Jose H. Nieto **Said** (2), Rafael Sanchez **Lamoneda** (3)
(1: University of Puerto Rico at Mayaguez; 2: Universidad del Zulia; 3: Universidad Antonio Narino)
THE MATHEMATICAL OLYMPIAD OF CENTRAL AMERICA AND THE CARIBBEAN:
17 YEARS SUPPORTING MATH CONTESTS IN THE REGION

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30
Location: H: orange, Educational Building, room 424
Session Chairs: Mary **Falk de Losada**, Alexander **Soifer**

Presentations: Kiril **Bankov***
(University of Sofia)
NUMBERS ON A CIRCLE

Borislav Yordanov **Lazarov***, Albena **Vassileva**
(Institute of Mathematics and Informatics)
AGE FACTOR IN PERFORMANCE ON A COMPETITION PAPER

TSG 31 – Language and communication in mathematics education

Co-chairs: Judit **Moschkovich** (USA), David **Wagner** (Canada)
Team members: Arindam Bose (South Africa), Jackeline Rodrigues Mendes (Brazil),
Marcus Schütte (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30
Location: I: blue, Philosophical Tower, lecture hall G
Session Chair: David **Wagner**

Presentations: David **Pimm***
(Simon Fraser University)
FIFTY YEARS OF LANGUAGE DATA IN MATHEMATICS EDUCATION: A BRIEF HISTORY

Marcus **Schuette***
(TU Dresden)
SUBJECT-RELATED ACADEMIC LANGUAGE VERSUS MATHEMATICAL DISCOURSE

Judit **Moschkovich***
(University of California)
RECOMMENDATIONS FOR RESEARCH ON LANGUAGE AND LEARNING MATHEMATICS

Topic Study Groups

TSG

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall G

Session Chair: Judit **Moschkovich**

Presentations: Arindam **Bose*** (1), K. **Subramaniam** (2), Mamokgethi **Phakeng** (3)

(1: University of South Africa; 2: Homi Bhabha Centre for Science Education; 3: University of Cape Town)

IDENTITY FOSTERED LANGUAGE COMMUNICATION IN A MATHEMATICS CLASSROOM: AN ANALYSIS

Kaouther **Boukafri*** (1), Marta **Civil** (2), Núria **Planas** (1)

(1: Universitat Autònoma de Barcelona; 2: University of Arizona)

A TEACHER'S USE OF REVOICING IN MATHEMATICAL DISCUSSIONS

Judith **Jung***, Marcus **Schuette**

(TU Dresden)

THE SIGNIFICANCE OF LINGUISTIC NEGOTIATION IN INCLUSIVE LEARNING OF MATHEMATICS IN PRIMARY SCHOOL

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall G

Session Chair: Jackeline Rodrigues **Mendes**

Presentations: Kirstin **Erath***

(TU Dortmund University)

HOW CAN TEACHERS PROVIDE LEARNING OPPORTUNITIES FOR ORAL EXPLANATIONS?

Jinwoo **Cho*** (1), Eunjung **Lee** (2), Minsun **Park** (1), Kyeong-Hwa **Lee** (1)

(1: Seoul National University; 2: Korea Foundation for the Advancement of Science & Creativity)

FROM A QUESTION TO QUESTIONING WITHIN THE CONTEXT

David **Wagner***, Annica **Andersson**

(University of New Brunswick)

4-YEAR-OLD LANGUAGE REPERTOIRE IN A COUNTING SITUATION

Jenni **Ingram***, Nick **Andrews**, Andrea **Pitt**

(University of Oxford)

MAKING STUDENT EXPLANATIONS RELEVANT IN WHOLE CLASS DISCUSSION

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall G

Session Chair: Arindam **Bose**

Presentations: Benadette **Aineamani***

(Pearson Holdings South Africa)

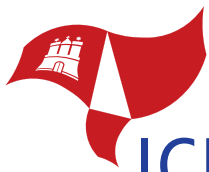
HOW LEARNERS COMMUNICATE THEIR MATHEMATICS REASONING IN A MATHEMATICS DISCOURSE.

Konstantinos **Tatsis*** (1), David **Wagner** (2)

(1: University of Ioannina; 2: University of New Brunswick)

AUTHORITY AND POLITENESS: JUXTAPOSED ANALYSES OF MATHEMATICS TEACHING EPISODES





Raquel **Milani***

(Federal University of Rio Grande)

“I AM SORRY. I DID NOT UNDERSTAND YOU”:

THE LEARNING OF DIALOGUE BY PROSPECTIVE TEACHERS

TSG 32 – Mathematics education in a multilingual and multicultural environment

Co-chairs: Richard **Barwell** (Canada), Anjum **Halai** (Pakistan)

Team members: Guida **de Abreu** (UK), Aldo **Parra** (Colombia), Lena **Wessel** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 220

Session Chairs: Richard **Barwell**, Anjum **Halai**

Presentations: Cris **Edmonds-Wathen***

(Umeå University)

DESCRIPTIVE AND TYPOLOGICAL LINGUISTIC METHODOLOGIES IN MATHEMATICS
EDUCATION RESEARCH

Jose Gregorio Solorzano **Movilla***

(Corporación Universitaria Americana)

FROM THE GRAMMATICAL ASPECTS OF THE ETTE TAARA TO THE ETTE ENNAKA'S
MATHEMATICS

Lisa Anne **Kasmer***, Anthony **Snyder**, Esther **Billings**

(Grand Valley State University)

TEXTBOOK LANGUAGE ACCESSIBLY IN ENGLISH MEDIUM CLASSES

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 220

Session Chairs: Richard **Barwell**, Anjum **Halai**

Presentations: Thulisile **Nkambule***

(University of South Africa)

THE SIGNIFICANCE OF SOCIAL IDENTITY:
A CASE OF MATHEMATICS CLASSROOM WITH IMMIGRANTS IN SOUTH AFRICA

Lucia Sonja **van Putten***, Hanlie **Botha**, Batseba **Mofolo-Mbokane**, Jeanine **Mwambakana**,
Gerrit **Stols**

(University of Pretoria)

THE CULTURALLY RICH MATHEMATICS CLASS

Vanessa **Tomaz***, Manuela **David**

(Universidade Federal De Minas Gerais)

HOW THE CHOICE OF ARTIFACTS MAY ENHANCE COMMUNICATION BETWEEN
DIFFERENT COMMUNITIES

Topic Study Groups

TSG

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 220

Session Chairs: Richard **Barwell**, Anjum **Halai**

Presentations: Aldo **Parra***

(Aalborg University)

EPISTEMIC DIMENSION OF MULTILINGUALISM: THE BRIGHT SIDE OF BABEL

Richard **Barwell***

(University of Ottawa)

MULTIPLE LANGUAGE RESOURCES IN AN ELEMENTARY SCHOOL MATHEMATICS CLASS FOR LEARNERS OF FRENCH IN QUEBEC

William C. **Zahner***

(San Diego State University)

BEYOND THE "LANGUAGE OF INSTRUCTION": USING FORMAL AND INFORMAL DISCOURSE PRACTICES IN LINGUISTICALLY DIVERSE CLASSROOMS

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 220

Session Chairs: Richard **Barwell**, Anjum **Halai**

Presentations: Lena **Wessel***, Susanne **Prediger**, Alexander **Meyer**, Taha **Kuzu**

(TU Dortmund)

IS GRADE 7 TOO LATE TO START WITH BILINGUAL MATHEMATICS COURSES? AN INTERVENTION STUDY

Marie Therese **Farrugia***

(University of Malta)

TRANSLANGUAGING BETWEEN MALTESE AND ENGLISH: THE CASE OF VALUE, COST AND CHANGE IN A GRADE 3 CLASSROOM

TSG 33 – Equity in mathematics education (including gender)

Co-chairs: Bill **Atweh** (Philippines), Joanne Rossi **Becker** (USA)

Team members: Barbro **Grevholm** (Norway), Gelsa **Knijnik** (Brazil), Laura **Martignon** (Germany), Jayasree **Subramanian** (India)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 212

Session Chairs: Bill **Atweh**, Joanne Rossi **Becker**

Presentations: Danny **Martin***, Victoria **Trinder**

(University of Illinois at Chicago)

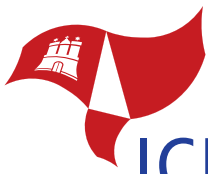
FROM CRITICAL TO RADICAL AGENDAS IN MATHEMATICS EDUCATION

Margaret **Walshaw***

(Massey University)

RECENT DEVELOPMENTS ON GENDER AND MATHEMATICS EDUCATION





Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 212

Session Chair: Joanne Rossi **Becker**

Presentations: Renato **Marcone***

(Federal University of Sao Paulo)

“I DON'T WANNA TEACH THIS KIND OF STUDENTS”: SILENCE IN MATHEMATICS
EDUCATION AND DEFICIENCIALISM “

Gelsa **Knijnik*** (1), Fernanda **Wanderer** (2)

(1: UNISINOS; 2: UFRGS)

MATHEMATICS EDUCATION, CULTURAL DIFFERENCES AND SOCIAL INEQUALITIES IN
RURAL BRAZILIAN SCHOOLS

Barbro **Grevholm*** (1), Ragnhild Johanne **Rensaa** (2)

(1: University of Agder; 2: Narvik University College)

INTERVENTIONS FOR EQUALITY – THEIR CREATION, LIFE AND DEATH.
WHAT CAN WE LEARN FROM THEM?

Mellony Holm **Graven*** (1), Nicky **Roberts** (2)

(1: Rhodes University; 2: University of Johannesburg)

FOCUSING ATTENTION ON PROMOTING LEARNER AGENCY FOR INCREASED QUALITY
AND EQUITY IN MATHEMATICS LEARNING

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 212

Group A – Session Chair: Bill **Atweh**

Presentations: Arindam **Bose** (1), Renato **Marcone*** (2), Varun **Kumar** (3)

(1: University of South Africa; 2: Federal University of Sao Paulo; 3: Tata Institute of Social Sciences)

NON-TYPICAL LEARNING SITES: A PLATFORM WHERE FOREGROUND INTERPLAYS
WITH BACKGROUND

Anita Movik **Simensen***, Anne Berit **Fuglestad**, Pauline **Vos**

(University of Agder)

LOWER ACHIEVING STUDENTS' CONTRIBUTIONS IN SMALL GROUPS –
WHAT IF A STUDENT SPEAKS WITH TWO VOICES

Maria Alva **Aberin***, Ma. Theresa **Fernando**, Flordeliza **Francisco**, Angela Fatima **Guzon**,

Catherine **Vistro-Yu**

(Ateneo de Manila University)

PERCEIVED GAINS IN STUDENTS' ABILITIES AND ATTITUDES TOWARDS MATHEMATICS
FROM AN AFTER-SCHOOL MATHEMATICS PROGRAM

Grant Adam **Fraser***

(California State University)

AN INTERVENTION PROGRAM TO IMPROVE THE SUCCESS RATE OF DISADVANTAGED
MINORITY STUDENTS IN PRE-CALCULUS COURSES

Topic Study Groups

TSG

Location: E: mint, Economical Building, room 1083

Group B – Session Chair: Barbro **Grevholm**

Presentations: Jennifer **Hall***

(Monash University)

GENDER, MATHEMATICS, AND MATHEMATICIANS: ELEMENTARY STUDENTS' VIEWS AND EXPERIENCES

Jayasree **Subramanian***

(Tata Institute of Social Sciences)

GENDER OF THE SCHOOL MATHEMATICS CURRICULUM

Eva **Norén***, Lisa Björklund **Boistrup**

(Stockholm University)

GENDER STEREOTYPES IN MATHEMATICS TEXTBOOKS

Anina **Mischau*** (1, 2), Katja **Eilerts** (2)

(1: Freie Universität Berlin; 2: Humboldt-Universität zu Berlin)

WITHOUT GENDER COMPETENT MATH TEACHERS NO GENDER EQUITY IN MATH EDUCATION AT SCHOOL

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 212

Session Chair: Jayasree **Subramanian**

Presentations: Bill **Atweh** (1), Dalene **Swanson*** (2)

(1: Philippines Normal University; 2: University of Stirling)

ALTERNATIVE UNDERSTANDINGS OF EQUITY AND THEIR RELATIONSHIP TO ETHICS

TSG 34 – Social and political dimensions of mathematics education

Co-chairs: Murad **Jurdak** (Lebanon), Renuka **Vithal** (South Africa)

Team members: Peter **Gates** (UK), Elizabeth **de Freitas** (USA), David **Kollosche** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 222

Session Chair: Renuka **Vithal**, Murad **Jurdak**

PANELISTS: PAOLA VALERO, LISA DARRAGH, RENUKA VITHAL, MURAD JURDAK

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 222

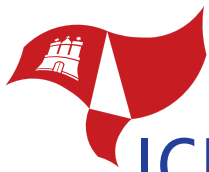
Group A – Session Chair: Renuka **Vithal**

Presentations: Paula Patricia Guerra **Lombardi*** (1), Woong **Lim** (2), Hyunjung **Kang** (3)

(1: Kennesaw State University; 2: University of New Mexico; 3: University of Northern Colorado)

TEACHING MATHEMATICS FOR SOCIAL JUSTICE HERE AND THERE:
TEACHER CANDIDATES' REACTIONS IN THE UNITED STATES AND URUGUAY





TSG

Peter **Appelbaum***

(Arcadia University)

NOMADIC TOPOLOGIES CHANGE MATHEMATICS EDUCATORS' SUBJECTIVITIES AND HENCE THEIR WORLDS

Celso Ribeiro **Campos***, Aurelio **Hess**

(Pontifícia Universidade Católica de São Paulo)

FINANCIAL EDUCATION AND MATHEMATICS EDUCATION: A CRITICAL APPROACH

Hilary **Povey**, Gill **Adams***, Rosie **Everley**

(Sheffield Hallam University)

"ITS INFLUENCE TAINTS ALL": MATHEMATICS TEACHERS RESISTING PERFORMATIVITY THROUGH ENGAGEMENT WITH THE PAST

Location: D: yellow, West Wing Building, room 223

Group B – Session Chair: David Kollosche

Presentations: Alexandre **Pais***

(Manchester Metropolitan University)

TRUTHS AND POWERS IN MATHEMATICS EDUCATION

Hauke **Straehler-Pohl***

(Freie Universität Berlin)

THE ETHICS OF MATHEMATICAL APPLICATION AND THE IDEOLOGY OF SOLUTIONISM

Alex Rodrigo Montecino **Muñoz***

(Aalborg University)

OUTCOME OF THE MARKET LOGIC: THE ACADEMIC-PROFESSIONAL DEVELOPMENT OF THE MATHEMATICS TEACHER

Laura **Black***, Sophina **Choudry**, Kelly **Pickard-Smith**, Bethany **Ryan**, Julian **Williams**

(University of Manchester)

ENACTING HYBRIDITY IN A HOME-SCHOOL MATHEMATICS ACTIVITY

Sabrina Bobsin **Salazar***

(University of Michigan)

MATHEMATICS, THE AXIOMATIZATION MOVEMENT, AND ITS SOCIAL IMPLICATIONS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 222

Group A – Session Chair: Murad **Jurdak**

Presentations: Tamsin **Meaney***

(Bergen University College)

MATHEMATICS CURRICULA: ISSUES OF ACCESS AND QUALITY

Natalia Ruiz **López*** (1), Gustavo **Bruno** (1), César Sáenz **de Castro** (1), José **Bosch Betancor** (2)

(1: Autonomous University of Madrid; 2: IES José Hierro)

MATHEMATICS EDUCATION FOR SOCIAL JUSTICE: A CASE STUDY

Topic Study Groups

TSG

Lisa Jean **Darragh***

(Universidad de Chile)

SOCIAL, POLITICAL, PERSONAL, AND IMAGINED CONSTRAINTS ON ENACTING CHANGE AFTER PROFESSIONAL DEVELOPMENT

Troels **Lange***, Tamsin **Meaney**

(Bergen University College)

THE PRODUCTION OF "COMMON SENSE" IN THE MEDIA ABOUT MORE MATHEMATICS IN EARLY CHILDHOOD EDUCATION

Belgüzar **Kara***

(University of Duisburg-Essen)

THE INFLUENCE OF HABITUAL DISPOSITIONS ACCORDING TO PIERRE BOURDIEU IN HANDLING MATHEMATICAL PROBLEMS

Location: D: yellow, West Wing Building, room 223

Group B – Session Chair: Elizabeth **de Freitas**

Presentations: Yvette **Solomon***

(Manchester Metropolitan University)

PARODY AND POWER: PRODUCING AND RESISTING MATHEMATICS 'ABILITY'

Anna **Chronaki***

(University of Thessaly)

MATHS MOVES ME: THE BODY AS A POLITICAL SPACE FOR LEARNING

Nina **Bohlmann***

(Freie Universität Berlin)

UNEQUAL BODIES – CORPOREALITY AND SOCIAL INEQUALITY IN THE CONTEXT OF MATHEMATICS EDUCATION

Elizabeth **de Freitas*** (1), Nathalie **Sinclair** (2)

(1: Manchester Metropolitan University; 2: Simon Fraser University)

THE BIOPOLITICS OF NUMBER SENSE: ORDINALITY AND ONTOLOGY

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 222

Session Chairs: David **Kollosche**, Elizabeth **de Freitas**

Presentations: David **Kollosche** (1), Elizabeth **de Freitas** (2)

(1: Universität Potsdam, 2: Manchester Metropolitan University)

ECONOMIC DIMENSIONS OF MATHEMATICS EDUCATION

Renuka **Vithal***

(University of KwaZulu-Natal)

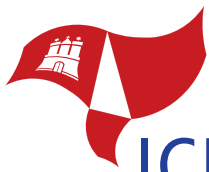
REPORTING BACK FROM PARALLEL SESSIONS

Murad **Jurdak***

(American University of Beirut)

THE IMPLICATIONS OF SOCIAL AND POLITICAL DIMENSIONS OF MATHEMATICS EDUCATION





TSG 35 – Role of ethnomathematics in mathematics education

Co-chairs: Milton **Rosa** (Brazil), Lawrence **Shirley** (USA)

Team members: Willy V. **Alangui** (Philippines), Maria Elena **Gavarrete** (Costa Rica)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 20

Session Chair: Lawrence **Shirley**

Presentations: Ubiratan **D’Ambrosio** (1), Milton **Rosa*** (2)

(1: Universidade Anhanguera; 2: Universidade Federal de Ouro Preto)

ETHNOMATHEMATICS AND ITS PEDAGOGICAL ACTION

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 20

Group A – Session Chair: Milton **Rosa**

Presentations: Marcos **Cherinda***

(Univeridade Pedagogica)

**FROM DEFROSTING HIDDEN MATHEMATICAL KNOWLEDGE TO ITS FORMAL LEARNING –
REVIEWING GERDES’ RESEARCH APPROACH**

Wilfredo **Alangui***

(University of the Philippines Baguio)

“THERE’S A THEORY BEHIND WHAT WE’RE DOING!”

ETHNOMATHEMATICS AND INDIGENOUS PEOPLES’ EDUCATION IN THE PHILIPPINES

Morane Almeida **Oliveira***

(Instituto Federal de Educação Ciência e Tecnologia do Acre – IFAC)

**PROPOSAL FOR A METHODOLOGICAL APPROACH FOR THE TECHNICAL COURSE FOR
INDIGENOUS AGROFORESTRY AGENTS IN THE STATE OF ACRE**

Location: H: orange, Educational Building, room 21

Group B – Session Chair: Maria Elena Gavarrete

Presentations: Tony **Trinick*** (1), Uenuku **Fairhall** (2), Tamsin **Meaney** (3)

(1: The University of Auckland; 2: Te Kura o Te Koutu; 3: Bergan University)

CULTURAL AND MATHEMATICAL SYMMETRY IN MAORI MEETING HOUSES

Veronica **Albanese*** (1), Natividad **Adamuz-Povedano** (2), Rafael **Bracho-López** (2)

(1: University of Granada; 2: University of Córdoba)

ETHNOMATHEMATICS: TWO THEORETICAL VIEWS AND TWO APPROACHES TO EDUCATION

Charoula **Stathopoulou***

(UNIVERSITY OF THESSALY)

ONCE UPON A TIME ... THE GYPSY BOY TURNED 15 WHILE STILL IN THE FIRST GRADE

Topic Study Groups

TSG

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 20

Group A – Session Chair: Lawrence Shirley

Presentations: Daniel Clark **Orey***
(UFOP)

THE CRITICAL-REFLECTIVE DIMENSION OF ETHNOMODELING

Location: H: orange, Educational Building, room 21

Group B – Session Chair: Maria Elena Gavarrete

Presentations: Miriam **Amit***, Fouse **Abu-Qouder**
(Ben Gurion University)

WEAVING CULTURE AND MATHEMATICS IN THE CLASSROOM –
THE CASE OF BEDOUIN ETHNOMATHEMATICS

Karen **François***

(Vrije Universiteit Brussel – Free University Brussels)

WITTGENSTEIN'S LATE PHILOSOPHY AS A PHILOSOPHICAL FOUNDATION
FOR ETHNOMATHEMATICS

Mogege **Mosimege***

(Human Sciences Research Council)

THE ROLE OF LANGUAGE IN ETHNOMATHEMATICAL RESEARCH AND IMPLICATIONS
FOR MATHEMATICS TEACHING AND LEARNING

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 20

Group A – Session Chair: Daniel Clark **Orey**

Presentations: Jaya Bishnu **Pradhan***
(Tribhuvan University)

CHUNDARAS' CULTURE AND MATHEMATICAL IDEAS

Maria Cecilia **Fantinato*** (1), José Ricardo **e Souza Mafra** (2)

(1: Universidade Federal Fluminense (UFF); 2: Universidade Federal do Oeste do Pará (UFOPA))

ARITAPERA'S CRAFTSWOMEN: INFORMAL LEARNING PROCESSES IN AN ETHNOGRAPHIC
STUDY IN ETHNOMATHEMATICS

Location: H: orange, Educational Building, room 21

Group B – Session Chair: Wilfredo **Alangui**

Presentations: Bo **Yu***
(southwest university)

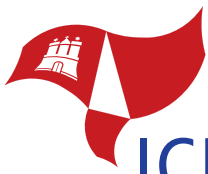
CURRICULUM REFORM AND ETHIC CULTURE IN ETHIC REGION

Tod **Shockey*** (1), John Bear **Mitchell** (2)

(1: University of Toledo; 2: University of Maine)

AN ETHNOMODEL OF A PENOBSCOT LODGE





Mônica Maria Borges **Mesquita***
(University of Lisbon and MARE Centre)
HUMAN TOPOLOGY. THE MATHEMATICS EDUCATION IN THE TIME OF THE ENCOUNTERS IN THE CLASHES

TSG 36 – Task design, analysis and learning environments

Co-chairs: Jiansheng **Bao** (China), Jere **Confrey** (USA)
Team members: Jonei **Barbosa** (Brazil), Helmut **Linneweber-Lammerskitten** (Switzerland), Anne **Watson** (UK)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30
Location: H: orange, Educational Building, room 05
Session Chair: Jere **Confrey**

Presentations: Anne **Watson***
(University of Oxford)
PARAMETERS FOR PRACTICE AND RESEARCH IN TASK DESIGN IN MATHEMATICS EDUCATION

Koeno **Gravemeijer***
(Eindhoven University of Technology)
A PERSONAL TAKE ON INSTRUCTIONAL DESIGN

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30
Location: H: orange, Educational Building, room 05
Session Chair: Anne **Watson**

Presentations: Kazuhiko **Nunokawa***
(Joetsu University of Education)
BRIDGING STUDENTS' IDEAS AND LESSONS' GOALS

Angelika **Kullberg***
(University of Gothenburg)
VARIATION WITHIN SETS OF EXAMPLES

Berta **Barquero*** (1), Ioannis **Papadopoulos** (2), Mario **Barajas** (3), Chronis **Kynigos** (4)
(1: University of Barcelona; 2: Aristotle University of Thessaloniki and CTI & Press Diophantus;
3: University of Barcelona; 4: University of Athens and CTI & Press Diophantus)
CROSS-CASE DESIGN IN USING DIGITAL TECHNOLOGIES: TWO COMMUNITIES OF INTEREST DESIGNING A C-BOOK UNIT

Topic Study Groups

TSG

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 05

Group A – Session Chair: Helmut **Linneweber-Lammerskitten**

Presentations: Alexandra **Thiel-Schneider***
(TU Dortmund)

HOW DOES THE CONNECTION OF DIFFERENT PERSPECTIVES ON EXPONENTIAL GROWTH SUCCEED?

Corey **Brady** (1), Cheryl **Eames** (2), Hyunyi **Jung*** (3)

(1: Vanderbilt University; 2: Southern Illinois University Edwardsville; 3: Calvin College)

DESIGN PRINCIPLES FOR CURRICULAR SEQUENCES FOCUSED ON MODELS AND MODELING

Natascha **Albersmann***

(Ruhr-Universität Bochum)

CONSTRUCTION OF MATHEMATICAL TASKS FOR PARENTS AND THEIR CHILDREN ON SECONDARY SCHOOL LEVEL

Jing **Cheng*** (1), Shuhua **An** (2), Jiansheng **Bao** (1)

(1: East China Normal University; 2: California State University Long Beach)

COGNITIVE DEMAND OF MATHEMATICS OPENING PROBLEMS EXHIBITED BY EXPERT SECONDARY MATHEMATICS TEACHERS IN SHANGHAI-CHINA

Location: H: orange, Educational Building, room 06

Group B – Session Chair: Anne Watson

Presentations: Jean Marie **Kraemer** (1), Joana Maria **Brocardo*** (2), Fatima **Mendes** (2),
Delgado **Catarina** (2)

(1: CITO; 2: ESE Instituto Politécnico de Setúbal)

DESIGNING TASKS FOR ADAPTIVE/FLEXIBLE MULTIPLICATIVE REASONING

Lilian Edelmira Isidro **Camac***, Candy Clara **Ordoñez Montañez**, Gina Patricia **Paz Huaman**

(Sistema Nacional de Evaluación Acreditación y Certificación de la Calidad de la Educación Básica)

AUTHENTIC TASKS TO ASSESS MATH COMPETENCE IN LEARNING PROGRESS MAPS

Dong-Won **Kim*** (1), JinHyeong **Park** (2)

(1: Cheongju National University of Education; 2: Myongji University)

BUILDING MATHEMATICAL STATEMENTS THROUGH EXEMPLIFYING

Gisela **Montiel***, Luis **López-Acosta**, Ricardo **Cantoral**, Olivia **Scholz**

(Centro de Investigación y de Estudios Avanzados del IPN)

DESIGN-BASED SOCIOEPISTEMOLOGICAL RESEARCH

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

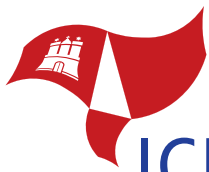
Location: H: orange, Educational Building, room 05

Session Chair: Jere **Confrey**

Presentations: Richard **Noss**, Celia **Hoyles***
(UCL Institute of Education)

MATHEMATICS AND DIGITAL TECHNOLOGY:
CHALLENGES AND EXAMPLES FROM DESIGN RESEARCH





TSG 37 – Mathematics curriculum development

Co-chairs: Anita **Rampal** (India), Zalman **Usiskin** (USA)

Team members: Andreas **Büchter** (Germany), Iman **Osta** (Lebanon), Jeremy **Hodgen** (UK)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 106

Session Chair: Anita **Rampal**

Presentations: Zalman **Usiskin***

(University of Chicago)

PARADIGMS OF CURRICULUM DEVELOPMENT IN SCHOOL MATHEMATICS –
A PERSONAL VIEW

Mark **Prendergast*** (1), Cormac **Breen** (2), Michael **Carr** (2), Fiona **Faulkner** (2)

(1: Trinity College Dublin; 2: Dublin Institute of Technology)

INVESTIGATING THIRD LEVEL LECTURERS' AWARENESS OF SECOND LEVEL
CURRICULUM REFORM

Maria-Teresa **Rojano-Ceballos*** (1), Armando **Solares-Rojas** (2)

(1: Centro de Investigación y de Estudios Avanzados; 2: Universidad Pedagógica Nacional)

TTHE MATHEMATICS CURRICULUM DESIGN FROM AN INTERNATIONAL PERSPECTIVE.
METHODOLOGICAL ELEMENTS FOR A COMPARATIVE ANALYSIS

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 106

Session Chair: Zalman **Usiskin**

Presentations: Anita **Rampal***

(Delhi University)

WHAT MATH FOR ALL? FOR AND FROM LIFE?

Jerry Lipka*

(university of alaska Fairbanks)

THE "CENTER OF EVERYTHING": INSIDERS AND OUTSIDERS WORKING TOGETHER
DEVELOPING MATHEMATICS CURRICULA

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 106

Session Chair: Andreas **Büchter**

Presentations: Vivien M. **Townsend***

(Manchester Metropolitan University)

THE 'MASTERY' CURRICULUM IN ENGLAND: A BATTLE WITH DOMINANT
DISCOURSES OF ABILITY AND ACCOUNTABILITY

Christian R. **Hirsch***

(Western Michigan University)

PRINT AND DIGITAL CURRICULUM DESIGN IN THE U.S.:
THE CASE OF TRANSITION TO COLLEGE MATHEMATICS AND STATISTICS

Topic Study Groups

TSG

Victor Egidius **Schmidt***, Jos **Tolboom**
(SLO)

DESIGN AND DEVELOPMENT OF A TREND ANALYSIS METHOD FOR A MATHEMATICS CURRICULUM

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 106

Session Chairs: Anita **Rampal**, Zalman **Usiskin**

Presentations: Guorui **Yan***, K.S. Frederick **Leung**
(The University of Hong Kong)

A COMPARATIVE CASE STUDY ON TEACHERS' USE OF MATHEMATICS TEXTBOOKS IN BEIJING AND HONG KONG

Dawn **Teuscher*** (1), Lisa **Kasmer** (2), Travis **Olson** (3), Shannon **Dingman** (4)

(1: Brigham Young University; 2: Grand Valley State University; 3: University of Nevada-Las Vegas; 4: University of Arkansas)

ISOMETRIES IN NEW U.S. MIDDLE GRADES TEXTBOOKS: HOW ARE ISOMETRIES AND CONGRUENCE RELATED?

TSG 38 – Research on resources (textbooks, learning materials etc.)

Co-chairs: Lianghuo **Fan** (UK), Luc **Trouche** (France)

Team members: Chunxia **Qi** (China), Sebastian **Rezat** (Germany), Jana **Visnovska** (Australia)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall D

Session Chair: Sebastian **Rezat**

Presentations: Janine **Remillard***
(University of Pennsylvania)

UNDERSTANDING TEACHER-RESOURCE INTERACTIONS: PERCEIVING CURRICULUM RESOURCES

Moneoang Jeanette **Leshota***, Jill **Adler**
(National University of Lesotho)

DISAGGREGATING A MATHEMATICS TEACHER'S PEDAGOGICAL DESIGN CAPACITY (PDC)

Lianghuo **Fan*** (1), Mailizar **Mailizar** (2), Manahel **Alafaleq** (1), Yi **Wang** (1)

(1: University of Southampton; 2: University of Southampton; Syiah Kuala University)

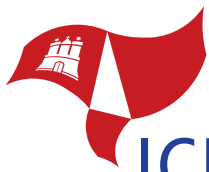
HOW PROOF IS PRESENTED IN SELECTED SECONDARY MATHS TEXTBOOKS IN CHINA, INDONESIA AND SAUDI ARABIA

Chunxia **Qi*** (1), Xinyan **Zhang** (2), Danting **Huang** (3)

(1: Beijing Normal University; 2: Tianjin Normal University; 3: Beijing NO. 80 Middle School)

RESEARCH ON TEXTBOOKS USED IN SECONDARY SCHOOL – FROM THE PERSPECTIVE OF TEACHERS' ROLE





Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall D

Session Chair: Jana **Visnovska**

Presentations: Luc **Trouche*** (1), Ghislaine **Gueudet** (2), Birgit **Pepin** (3)

(1: Ecole Normale Supérieure de Lyon; 2: UBO; 3: TU/e)

OPEN EDUCATIONAL RESOURCES: A CHANCE FOR ENRICHING MATHEMATICS TEACHERS' RESOURCE SYSTEMS?

Chronis **Kynigos***, Aggeliki **Kolovou**

(UoA & CTI)

TEACHERS AS DESIGNERS OF DIGITAL EDUCATIONAL RESOURCES FOR CREATIVE MATHEMATICAL THINKING

Shuping **Pu*** (1,2), Naiqing **Song** (2)

(1: Chongqing Normal University; 2: Southwest University)

RESEARCH ON INTERNATIONAL DEVELOPMENT TRENDS OF PRIMARY MATHEMATICS TEXTBOOKS IN THE 21ST CENTURY

Katiane **de Moraes Rocha***

(Ecole Normale Supérieure)

USES OF ONLINE RESOURCES AND DOCUMENTATIONAL TRAJECTORIES: THE CASE OF SÉSAMATH.

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall D

Session Chair: Chunxia **Qi**

Presentations: Hendrik **Van Steenbrugge***, Maria **Larsson**, Andreas **Ryve**,

Eva **Insulander**, Daniel **Brehmer**

(Mälardalen University)

CURRICULUM SUPPORT FOR TEACHERS: A COLLECTIVE PERSPECTIVE

Axelle Person **Faughn***, Nathan **Borchelt**

(Western Carolina University)

MATHEMATICS TEACHERS' CIRCLES: A RESOURCE PERSPECTIVE ON CLASSROOM TRANSFER

Chongyang **Wang***

(East China Normal University)

ANALYSING TEACHERS' EXPERTISE, RESOURCES AND COLLECTIVE WORK THROUGHOUT CHINESE AND FRENCH WINDOWS

Nataly **Essonnier*** (1), Chronis **Kynigos** (2), Jana **Trgalova** (1), Maria **Daskolia** (2)

(1: University Claude Bernard Lyon 1; 2: CTI & Press "Diophantus")

STUDYING THE ROLE OF CONTEXT IN SOCIAL CREATIVITY FOR THE DESIGN OF DIGITAL RESOURCES

Topic Study Groups

TSG

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: I: blue, Philosophical Tower, lecture hall D

Session Chairs: Lianghuo **Fan**, Luc **Trouche**

Presentations: Kenneth **Ruthven***

(University of Cambridge)

RESEARCHING INSTRUCTIONAL ACTIVITY AND STUDENT INTERACTION WITH
AND THROUGH DIGITAL RESOURCES

Jana **Visnovska*** (1), Jose Luis **Cortina** (2)

(1: The University of Queensland; 2: Universidad Pedagogica Nacional)

RESOURCES AS A MEANS OF SUPPORTING TEACHERS IN PLANNING FOR
INTERACTIONS WITH STUDENTS' IDEAS

Elena **Naftaliev***

(Achva Academic College)

ENGAGEMENTS OF PROSPECTIVE TEACHERS WITH E-TEXTBOOK

Ok-Kyeong **Kim***

(Western Michigan University)

TEACHER DECISIONS ON LESSON SEQUENCE AND THEIR IMPACT ON OPPORTUNITIES
FOR STUDENTS TO LEARN

TSG 39 – Large scale assessment and testing in mathematics education

Co-chairs: Rae Young **Kim** (Korea), Christine **Suurtamm** (Canada)

Team members: Edward **Silver** (USA), Stefan **Ufer** (Germany), Pauline **Vos** (Norway)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 122

Session Chairs: Rae Young **Kim**, Christine **Suurtamm**

Presentations: Christian **Bokhove***

(University of Southampton)

OPPORTUNITY TO LEARN MATHS: A CURRICULUM APPROACH WITH TIMSS 2011 DATA

Emiliano Augusto **Chagas*** (1), Mauricio Urban **Kleinke** (2)

(1: Escola Superior de Engenharia e Gestão; 2: Universidade Estadual de Campinas)

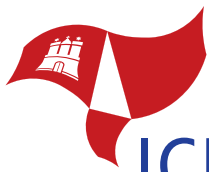
LARGE-SCALE ASSESSMENT AS A WAY OF STUDYING NATIONAL ISSUES OF GENDER
AND SOCIOECONOMIC STATUS

Christina **Drüke-Noe*** (1), Svenja Mareike **Kühn** (2)

(1: Pädagogische Hochschule Weingarten; 2: Universität Duisburg-Essen)

CHARACTERISTICS OF MATHEMATICS TASKS SET IN EUROPEAN STATEWIDE EXIT EXAMS





Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 122

Session Chairs: Christine **Suurtamm**, Rae Young **Kim**

Presentations: John Kwame **Dogbey*** (1), James Kwame **Dogbey** (2)

(1: University of Nebraska at Omaha; 2: Texas A&M University – Corpus Christi)

DEPTH OF KNOWLEDGE AND CONTEXT CHARACTERISTICS OF THE WEST AFRICAN EXAMINATION COUNCIL'S CORE MATHEMATICS ASSESSMENT

Nadine **Grapin***

(LDAR-UPEC)

VALIDITY OF LARGE SCALE MATHEMATICS ASSESSMENT: A DIDACTICAL ANALYSIS

Tibor **Marcinek*** (1), Edita **Partová** (2)

(1: Central Michigan University; 2: Comenius University)

EXPLORING CULTURAL ASPECTS OF KNOWLEDGE FOR TEACHING THROUGH ADAPTATION OF U.S.-DEVELOPED MEASURES: CASE OF SLOVAKIA

Dun Nkhoma **Kasoka*** (1), Arne **Jakobsen** (2), Mercy **Kazima** (1)

(1: University of Malawi; 2: University of Stavanger)

PSYCHOMETRIC PROPERTIES OF ADAPTED MATHEMATICAL KNOWLEDGE FOR TEACHING MEASURES FOR USE IN MALAWI

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 221

Session Chairs: Karin **Brodie**, Christine **Suurtamm**

Presentations: Jonathan David **Bostic*** (1), Toni **Sondergeld** (2)

(1: Bowling Green State University; 2: Drexel University)

VALIDATING AND VERTICALLY EQUATING PROBLEM-SOLVING MEASURES

Francisco J. **Ariza-Hernandez**, Flor M. **Rodriguez-Vásquez**, Martin P. **Arciga-Alejandre***

(Universidad Autonoma de Guerrero)

ANALYSIS OF THE UNDERSTANDING OF A MATHEMATICAL CONCEPT USING A BAYESIAN IRT MODEL

Hugh **Burkhardt***

(Shell Centre)

HIGH-STAKES ASSESSMENT AS A TOOL FOR IMPROVEMENT

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 122

Session Chair: Rae Young **Kim**

Presentations: S. Kanageswari Suppiah **Shanmugam***

(Universiti Utara Malaysia)

STUDENTS' ACHIEVEMENT IN TIMSS 2011 MATHEMATICS: A LOOK AT THE COGNITIVE DOMAINS

Maria Susanna **Weitz***, Hamsa **Venkat**
(University of the Witwatersrand)

PREDICTING MATHEMATICAL PERFORMANCE FROM EARLY ASSESSMENTS
IN SOUTH AFRICA

Hak Ping **Tam*** (1), Shuk-kwan S. **Leung** (2)

(1: National Taiwan Normal University; 2: National Sun-Yat Sen University)

PERFORMANCE OF TAIWAN STUDENTS ON LINE SYMMETRY ITEMS IN LARGE
SCALE ASSESSMENTS

Federica **Ferretti*** (1), Alessandro **Gambini** (2), Giorgio **Bolondi** (1)

(1: University of Bologna; 2: University of Ferrara)

THE AGE OF THE EARTH EFFECT: A SITUATION OF DIDACTIC CONTRACT

TSG 40 – Classroom assessment for mathematics learning

Co-chairs: Karin **Brodie** (South Africa), Denisse **Thompson** (USA)

Team members: Leonora Diaz **Moreno** (Chile), Natalie **Sayac** (France), Stanislaw **Schukajlow** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 221

Session Chair: Denisse **Thompson**

Presentations: Malcolm **Swan**, Colin **Foster***
(University of Nottingham)

FORMATIVE ASSESSMENT LESSONS FOR CONCEPT DEVELOPMENT AND
PROBLEM SOLVING

Carolyn Jia Ling **Sia***, Chap Sam **Lim**
(Universiti Sains Malaysia)

USING COGNITIVE DIAGNOSTIC ASSESSMENT (CDA) AS AN ALTERNATIVE MODES
OF ASSESSMENT FOR LEARNING

Miriam **Krieger*** (1), Melanie **Platz** (2), Kathrin **Winter** (3), Engelbert **Niehaus** (2)

(1: University of Münster; 2: University of Koblenz-Landau; 3: University of Flensburg)

CLASSROOM ASSESSMENT AND LEARNING SUPPORT FOR LOGICAL REASONING IN
MATHEMATICS EDUCATION

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 221

Session Chair: Karin **Brodie**

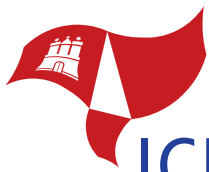
Presentations: Nathalie **Sayac***
(Université Paris Est Créteil)

HOW ARE PUPILS IN FRENCH PRIMARY SCHOOL ASSESSED IN MATHEMATICS ?
A DIDACTICAL APPROACH TO EXPLORE THIS QUESTION

Christine Pamela **Hardie***
(Cognition Education)

MAKING OVERALL TEACHER JUDGMENTS IN MATHEMATICS





TSG

Richelle Marie **Marynowski***

(University of Lethbridge)

SECONDARY MATHEMATICS TEACHER ASSESSMENT BELIEFS AND PRACTICES

Jimmy **Pai***

(University of Ottawa)

IN-THE-MOMENT DECISIONS: AN INVESTIGATION ON OBSERVATIONS AND CONVERSATIONS AS ASSESSMENTS IN THE SECONDARY CLASSROOM

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 221

Session Chairs: Karin **Brodie**, Christine **Suurtamm**

Presentations: Jonathan David **Bostic*** (1), Toni **Sondergeld** (2)

(1: Bowling Green State University; 2: Drexel University)

VALIDATING AND VERTICALLY EQUATING PROBLEM-SOLVING MEASURES

Francisco J. **Ariza-Hernandez**, Flor M. **Rodriguez-Vásquez**, Martin P. **Arciga-Alejandro***

(Universidad Autonoma de Guerrero)

ANALYSIS OF THE UNDERSTANDING OF A MATHEMATICAL CONCEPT USING A BAYESIAN IRT MODEL

Hugh **Burkhardt***

(Shell Centre)

HIGH-STAKES ASSESSMENT AS A TOOL FOR IMPROVEMENT

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 221

Session Chair: Denisse **Thompson**

Presentations: Amanda Jane **O'Shea***

(University of Northampton)

EXEMPLIFYING THE EXPERT PRIMARY MATHEMATICS CLASSROOM: THE CASE OF ALEX AND ASSESSMENT FOR LEARNING.

Michiel **Veldhuis***, Marja **Van den Heuvel-Panhuizen**, Xiaoyan **Zhao**

(Utrecht University)

SUPPORTING PRIMARY SCHOOL TEACHERS' ASSESSMENT PRACTICE IN MATHEMATICS: EFFECTS ON STUDENTS' LEARNING

Rafi' **Safadi***

(The Academic Arab College for Education in Israel)

SELF-DIAGNOSIS AS A TOOL FOR SUPPORTING 5TH-GRADERS' LEARNING ABOUT SIMPLE FRACTIONS

Waldemar **Straumberger***

(University of Bielefeld)

USING SELF-ASSESSMENT FOR INDIVIDUAL PRACTICE IN MATH CLASSES

TSG 41 – Uses of technology in primary mathematics education (up to age 10)

Co-chairs: Sophie **Soury-Lavergne** (France), Colleen **Vale** (Australia)
Team members: Francesca **Ferrara** (Italy), Krongthong **Khairree** (Thailand), Silke **Ladel** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 222

Session Chairs: Colleen **Vale**, Sophie **Soury-Lavergne**

Presentations: Kevin **Larkin*** (1), Todd **Milford** (2)

(1: Griffith University; 2: University of Victoria)

ENHANCING STUDENT LEARNING USING GEOMETRY APPS:

UTILISING THE HOMOGENEITY AND HETEROGENEITY OF CLUSTERS OF APPS

Annie **Savard*** (1), Kate **Highfield** (2)

(1: McGill University; 2: Macquarie University)

ROBOTIC TASKS: AFFORDANCES FOR MATHEMATICS LEARNING?

Anne **Voltolini***

(École Normale Supérieure de Lyon)

DUO OF DIGITAL AND MATERIAL ARTIFACTS DEDICATED TO THE LEARNING OF
GEOMETRIE AT PRIMARY SCHOOL

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 222

Session Chair: Silke **Ladel**

Presentations: Patricia **Moyer-Packenham***, Jessica **Shumway**, Emma **Bullock**,

Katie **Anderson-Pence**, Stephen **Tucker**, Arla **Westenskow**, Jennifer **Boyer-Thurgood**,

Hilal **Gulkilik**, Christina **Watts**, Kerry **Jordan**

(Utah State University)

USING VIRTUAL MANIPULATIVES ON IPADS: HOW APP ALIGNMENT PROMOTES
YOUNG CHILDREN'S MATHEMATICS LEARNING

Sophie **Soury-Lavergne***

(Institut Français de l'Éducation ENS de Lyon)

DUOS OF ARTEFACTS TO ENHANCE MATHEMATICAL LEARNING

Sean **Chorney***

(Simon Fraser University)

EXPLORING THE SOCIAL DIMENSION OF USING TOUCHCOUNTS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 222

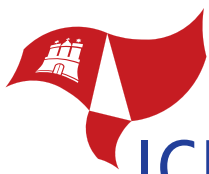
Session Chair: Krongthong **Khairree**

Presentations: Catherine **Attard***

(Western Sydney University)

IS CURRENT RESEARCH ASSISTING THE IMPLEMENTATION OF CONTEMPORARY
ICT IN THE PRIMARY MATHEMATICS CLASSROOM?





TSG

Nigel Stuart **Calder***, Carol **Murphy**
(University of Waikato)

RESHAPING THE LEARNING EXPERIENCE THROUGH APPS: AFFORDANCES

Shannon **Larsen*** (1), Kelly **McCormick** (2), Pam **Buffington** (3), Josephine **Louie** (3)
(1: University of Maine at Farmington; 2: University of Southern Maine;
3: Education Development Center)

USING 1-1 MOBILE TECHNOLOGY TO SUPPORT STUDENT DISCOURSE

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 222

Session Chair: Francesca **Ferrara**

Presentations: Krongthong **Khairree***
(International College)

ENHANCING STUDENTS' VISUALIZE SKILLS IN SOLVING WORD PROBLEMS USING
BAR MODEL AND THE GEOMETER'S SKETCHPAD

Stéphane **Cyr***, Patrick **Charland**, Martin **Riopel**, Marie-Hélène **Bruyère**
(UNIVERSITÉ DU QUÉBEC À MONTRÉAL)

IMPACT OF A VIDEO GAME ON FRACTIONS CONCEPT LEARNING IN ELEMENTARY
SCHOOL STUDENTS

Tony **Trinick**, Piata **Allen***, Bruce **Taplin**, Ana **Pipi**
(The University of Auckland)

HE PUAWAITANGA HARAKEKE – USING TECHNOLOGY TO ACCELERATE LEARNING
IN INDIGENOUS LANGUAGE SCHOOLS

TSG 42 – Uses of technology in lower secondary mathematics education (age 10 to 14)

Co-chairs: Lynda **Ball** (Australia), Paul **Drijvers** (Netherlands)

Team members: Bärbel **Barzel** (Germany), Yiming **Cao** (China), Michela **Maschietto** (Italy)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 120

Session Chair: Lynda **Ball**

Presentations: Paul **Drijvers***
(Freudenthal Institute Utrecht University)

EVIDENCE FOR BENEFIT? REVIEWING EMPIRICAL RESEARCH ON THE USE OF
DIGITAL TOOLS IN MATHEMATICS EDUCATION

M. Kathleen **Heid***
(The Pennsylvania State University)

QUALITATIVE RESEARCH ON THE USE OF DIGITAL TOOLS IN MATHEMATICS
TEACHING AND LEARNING: WHAT CAN BE LEARNED FROM IT?

Topic Study Groups

TSG

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 120

Group A – Session Chairs: Bärbel **Barzel**, Paul **Drijvers**

TSG TEAM PRESENTATION ON TOPICAL SURVEY AND TSG ROUND TABLE

Location: K: purple, Law Building, room 5+6

Group B – Session Chairs: Michela **Maschietto**, Lynda **Ball**

Focus: Mathematics Education in 2025

TSG TEAM PRESENTATION ON TOPICAL SURVEY AND TSG ROUND TABLE

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 120

Session Chair: Yiming **Cao**

Presentations: Brigitte **Grugeon***

(LDAR UPEC)

ONLINE AUTOMATED ASSESSMENT AND STUDENT LEARNING:

THE PEPITE PROJECT IN ELEMENTARY ALGEBRA

Gilles **Aldon***, Monica **Panero**

(Ecole Normale Supérieure de Lyon)

FORMATIVE ASSESSMENT IN MATHEMATICS AND SCIENCE:

WHICH ROLE FOR TECHNOLOGY?

Marja **Van den Heuvel-Panhuizen** (1,2), Ilona **Friso-van den Bos*** (2), Mieke **Abels** (1)

(1: Freudenthal Institute; 2: Freudenthal Group)

FORMATIVE ASSESSMENT IN MATHEMATICS EDUCATION BY USING TECHNOLOGY

Hana **Ruchniewicz***

(University of Duisburg-Essen)

DEVELOPING A DIGITAL TOOL FOR FORMATIVE SELF-ASSESSMENT

Thomas **Dick***

(Oregon State University)

HARNESSING DYNAMIC CAS AND GEOMETRY TO ENHANCE DIGITAL ASSESSMENT

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 120

Session Chair: Paul **Drijvers**

Presentations: Alison **Clark-Wilson***

(UCL Institute of Education)

THE MULTI-FACETED ROLE OF TECHNOLOGY TO DEVELOP TEACHERS' PROFESSIONAL

KNOWLEDGE AND PRACTICE TO USE DYNAMIC TECHNOLOGY

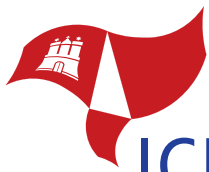
Lynda **Ball*** (1), Barbel **Barzel** (2)

(1: The University of Melbourne; 2: University of Duisburg-Essen)

COMMUNICATION AND COLLABORATION WHEN LEARNING AND TEACHING

MATHEMATICS WITH TECHNOLOGY





Aysun Sulun **Tas** (1), Serkan **Özel*** (1), Zeynep Ebrar **Özel** (2)
(1: Bogazici University; 2: Fatih University)

THE EFFECT OF MATHEMATICS ONLINE REVIEW SESSIONS THROUGH A WEBCAST SYSTEM ON 5TH-GRADE STUDENTS' MATHEMATICS ACHIEVEMENT

TSG 43 – Uses of technology in upper secondary mathematics education (age 14 to 19)

Co-chairs: Colette **Laborde** (France), Stephen **Hegedus** (USA)

Team members: Luis Moreno **Armella** (Mexico), Hans-Stefan **Siller** (Germany), Michal **Tabach** (Israel)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: G: green, Social Science Building, room 7

Session Chair: Colette **Laborde**

Presentations: Luis **Moreno-Armella*** (1), Corey **Brady** (2)
(1: Cinvestav-IPN; 2: Vanderbilt University)

TECHNOLOGY IN SECONDARY MATHEMATICS EDUCATION: THEORY

Sara **Dalton*** (1), Stephen **Hegedus** (2)

(1: Kaput Center for Research & Innovation in STEM Education; 2: Southern Connecticut State University)

THE ROLE OF NEW TECHNOLOGIES: CHANGING INTERACTIONS

Hans-Stefan **Siller***

(Universität Koblenz-Landau)

INTERRELATIONS BETWEEN TECHNOLOGY AND MATHEMATICS

Michal **Tabach*** (1), Jana **Trgalová** (2)

(1: Tel-Aviv University; 2: Claude Bernard University)

TEACHER EDUCATION WITH TECHNOLOGY: WHAT, HOW AND WHY

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: G: green, Social Science Building, room 7

Group A – Session Chair: Luis Moreno-Armella

Presentations: Ana **Donevska-Todorova***

(Humboldt-Universität zu Berlin)

THINKING MODES, WITH OR WITHOUT TECHNOLOGY?

Håkan **Sollervall***

(Linnaeus University)

TRANSFORMING A PROCEDURAL CALCULUS TASK INTO A STRUCTURED EXPLORATION WITH DYNAMIC REPRESENTATIONS

Location: G: green, Social Science Building, room 8

Group B – Session Chair: Stephen **Hegedus**

Presentations: Oi-Lam **Ng***, Nathalie **Sinclair**

(Simon Fraser University)

DRAWING IN SPACE: DOING MATHEMATICS WITH 3D PENS

Topic Study Groups

TSG

Gilbert **Greefrath*** (1), Hans-Stefan **Siller** (2)
(1: University of Muenster; 2: University of Koblenz-Landau)
GEOGEBRA AS A TOOL FOR SUPPORTING MODELLING PROCESSES

Daniel **Thurm***
(University of Duisburg-Essen)
UNDERSTANDING TEACHER BELIEFS AND TECHNOLOGY INTEGRATION –
A BASIS FOR EFFECTIVE TEACHER EDUCATION

Third Session: Friday, 29 July 2016, 12.00 – 13.30
Location: G: green, Social Science Building, room 7
Group A – Session Chair: Michal **Tabach**

Presentations: Johannes **Beck***
(Universität Würzburg)
A LINGUISTIC APPROACH TO CAS WRITTEN SOLUTIONS

Jana **Trgalova** (1), Mohamed **El-Demerdash*** (2), Oliver **Labs** (3), Jean-François **Nicaud** (4)
(1: S2HEP; 2: S2HEP; 3: University of Potsdam and MO-Labs; 4: ARISTOD)
COLLABORATIVE DESIGN OF EDUCATIONAL DIGITAL RESOURCES FOR PROMOTING
CREATIVE MATHEMATICAL THINKING

Elayne Weger **Bowman***
(Oklahoma Christian University)
EMBRACING GRAPHING CALCULATORS IN ALGEBRA II TO FACILITATE COMMON
CORE STATE STANDARDS MASTERY

Location: G: green, Social Science Building, room 8
Group B – Session Chair: Colette **Laborde**

Presentations: Giulia **Ferrari***, Francesca **Ferrara**
(Università di Torino)
DIAGRAMS AND TOOL USE: MAKING A CIRCLE WITH WIIGRAPH

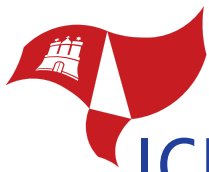
Morten **Misfeldt*** (1), Uffe Thomas **Jankvist** (2)
(1: Aalborg University; 2: Aarhus University)
INSTRUMENTAL GENESIS AND PROOF: UNDERSTANDING THE ROLES OF COMPUTER
ALGEBRA SYSTEMS IN TEXTBOOK PROOFS

Tugçe **Kozaklı*** (1), Hatice **Akkoç** (2)
(1: Uludag University; 2: Marmara University)
EMERGING SOCIAL AND SOCIO-MATHEMATICAL NORMS DURING
TECHNOLOGY-ENHANCED LESSONS

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30
Location: G: green, Social Science Building, room 7
Session Chairs: Colette **Laborde**, Stephen **Hegedus**

SUMMARY PRESENTATIONS AND GENERAL DISCUSSION
INCLUDING SHOWCASE EXAMPLES OF ACTIVITIES





TSG 44 – Distance learning, e-learning, blended learning

Co-chairs: Rúbia Barcelos **Amaral** (Brazil), Veronica **Hoyos** (Mexico)
Team members: Els **de Geest** (UK), Jason **Silverman** (USA), Rose **Vogel** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 211

Session Chair: Rose **Vogel**

Presentations: Fabian **Mundt***, Mutfried **Hartmann**
(University of Education Karlsruhe)

QUALITY DESPITE QUANTITY – THE E:T:P:M@MATH CONCEPT FOR BLENDED LEARNING
AT THE BEGINNING OF MATHEMATICAL STUDIES

Kar Fu **Yeung**, Rachel Ka Wai **Lui***, William Man Yin **Cheung**, Eddy Kwok Fai **Lam**, Nam Kiu **Tsing**
(The University of Hong Kong)

A CALCULUS E-LEARNING SYSTEM FOR FIRST-YEAR UNIVERSITY STUDENTS WITH
DIVERSE MATHEMATICS BACKGROUND

Karin **Landenfeld***, Martin **Göbbels**, Antonia **Hintze**
(Hochschule für Angewandte Wissenschaften)

A CUSTOMIZED LEARNING ENVIRONMENT AND INDIVIDUAL LEARNING IN
MATHEMATICAL PREPARATION COURSES

Tatjana **Hrubik-Vulanovic***

(Kent State University at Stark)

EVALUATION OF AN INTELLIGENT TUTORING SYSTEM THROUGH SUBSEQUENT
MATHEMATICS COURSES

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 211

Session Chair: Rúbia Barcelos **Amaral**

Presentations: Arthur **Powell**
(Rutgers University)

COLLABORATIVE PRACTICES AND AWARENESS: EXTENDING MATHEMATICAL IDEAS
THROUGH DISCURSIVE AND INSCRIPTIVE, ONLINE INTERACTIONS

Kadian M. **Callahan*** (1), Anne Marie S. **Marshall** (2)
(1: Kennesaw State University; 2: Berry College)

USING ONLINE DISCUSSIONS WITH IN-CLASS TASKS – A BLENDED INSTRUCTIONAL
APPROACH FOR TEACHER EDUCATION

Mandy **Lo***, Julie-Ann **Edwards**, Christian **Bokhove**, Hugh **Davis**
(University of Southampton)

HANDWRITING RECOGNITION SOFTWARE AND STUDENTS' ONLINE COLLABORATIVE
LEARNING EXPERIENCE IN ALGEBRA STUDIES

Topic Study Groups

TSG

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 211

Session Chair: Jason **Silverman**

Presentations: Elizabeth **Fleming** (1), Daniel **Chazan*** (1), Patricio **Herbst** (2), Dana **Grosser-Clarkson** (1)
(1: University of Maryland; 2: University of Michigan)

DESCRIBING CURRICULAR MATERIALS FOR MATHEMATICS TEACHER EDUCATION
IN AN ONLINE, RICH MEDIA PLATFORM

Cosette **Crisan***

(UCL Institute of Education)

USING VIDEO CASES IN AN ONLINE COURSE: SUPPORTING TEACHERS IN DEVELOPING
THEIR RITPACK

Tamar Ann **Avineri**, Hollylynne **Lee**, Dung **Tran**, Jennifer **Lovett***, Theresa **Gibson**

(North Carolina State University)

DESIGN AND IMPACT OF MOOCS FOR MATHEMATICS TEACHERS

Yaniv **Biton*** (1), Osnat **Fellus** (2)

(1: Technion – Israel Institute of Technology; 2: University of Ottawa)

PROFESSIONAL DISTANCE LEARNING COMMUNITY:
A CASE STUDY – MATHEMATICS IN THE VIRTUAL HIGH SCHOOL

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 211

Session Chair: Veronica **Hoyos**

Presentations: Marcelo **Borba***

(Universidade Estadual Paulista Júlio de Mesquita Filho)

A SURVEY ON MATHEMATICS EDUCATION AND TECHNOLOGY

Giovannina **Albano*** (1), Maria **Polo** (2), Pier Luigi **Ferrari** (3)

(1: University of Salerno; 2: University of Cagliari; 3: University of Piemonte Orientale)

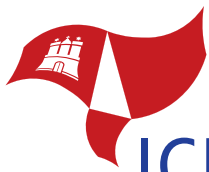
MATHEMATICS ONLINE COMMUNITY AT UNIVERSITY LEVEL

Angela María **Restrepo***

(Universidad de los Andes)

EMERGENCE AND SUSTAINABILITY OF COMMUNITIES OF PRACTICE IN THE
MOOC EFAN MATHS





TSG 45 – Knowledge in/for teaching mathematics at primary level

Co-chairs: Carolyn **Maher** (USA), Peter **Sullivan** (Australia)
Team members: Hedwig **Gasteiger** (Germany), Soo Jin **Lee** (Korea)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, lecture hall B

Session Chair: Peter **Sullivan**

Presentations: Peter **Sullivan***
(Monash University)

SUPPORTING TEACHERS IN IMPROVING THEIR KNOWLEDGE OF MATHEMATICS

Hedwig **Gasteiger*** (1), Christiane **Benz** (2)
(1: LMU München; 2: PH Karlsruhe)

PROFESSIONAL KNOWLEDGE FOR EARLY MATHEMATICS EDUCATION

Axel **Schulz***

(Bielefeld University)

DIAGNOSTIC KNOWLEDGE TO IDENTIFY LEARNING DIFFICULTIES AND FOSTER
MATHEMATICAL LEARNING

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, lecture hall B

Session Chair: Carolyn A. **Maher**

Presentations: Robert **Sigley***, Carolyn A. **Maher**
(Rutgers University)

TEACHER LEARNING ABOUT MATHEMATICAL REASONING: AN INSTRUCTIONAL MODEL

Soo Jin **Lee***, Jaehong **Shin**
(Korea National University of Education)

KEY DEVELOPMENTAL UNDERSTANDINGS-BASED TEXTBOOK ANALYSIS:
FRACTION ADDITION AND MULTIPLICATION

Sharyn Lee **Livy***

(Monash University)

MINIMISING THE LESSON INTRODUCTION PROVIDES AN OPPORTUNITY FOR STUDENTS
TO WORK IT OUT THEMSELVE

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, lecture hall B

Session Chair: Doug **Clarke**

Presentations: Doug **Clarke***, Anne **Roche**
(Australian Catholic University)

USING TASKS FROM CONTEXTS TO ENGAGE STUDENTS IN MEANINGFUL AND
WORTHWHILE LEARNING

Topic Study Groups

TSG

Therese **Dooley***

(Dublin City University)

PUPILS AS KNOWLEDGE AGENTS AND MONITORS IN THE CONSTRUCTION OF MATHEMATICAL IDEAS

Brenda **Bicknell***, Jenny **Young-Loveridge**

(The University of Waikato)

USING TASK DESIGN TO BUILD TEACHER KNOWLEDGE

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, lecture hall B

Session Chair: Louise **Wilkinson**

Presentations: Louise **Wilkinson***

(Syracuse University)

TEACHING THE LANGUAGE OF MATHEMATICS: WHAT TEACHERS NEED TO KNOW AND DO

Dennis **Meyer***

(Universität Hamburg)

STRUCTURE AND DEVELOPMENT OF PRIMARY TEACHER'S PROFESSIONAL COMPETENCIES

Martina **Hoffmann***

(University of Duisburg-Essen)

TEACHERS' COMPETENCES IN DIAGNOSTIC AND SUPPORT IN INCLUSIVE MATHEMATICS EDUCATION – A RESEARCH PROJECT

TSG 46 – Knowledge in/for teaching mathematics at secondary level

Co-chairs: Ruhama **Even** (Israel), Xinrong **Yang** (China)

Team members: Nils **Buchholtz** (Germany), Charalambos **Charalambous** (Cyprus),

Tim **Rowland** (Great Britain)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 121

Session Chairs: Nils **Buchholtz**, Tim **Rowland**

Presentations: Michael **Neubrand***

(University of Oldenburg)

CONCEPTUALIZATION AND THEORIZATION OF KNOWLEDGE IN/FOR TEACHING MATHEMATICS AT THE SECONDARY LEVEL

Aiso **Heinze***, Anke **Lindmeier**, Anika **Dreher**

(IPN Kiel)

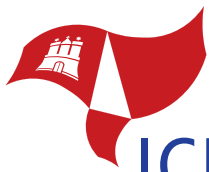
ACADEMIC MATHEMATICS OR SCHOOL MATHEMATICS?
WHAT KIND OF CONTENT KNOWLEDGE DO MATHEMATICS TEACHERS NEED?

Tim **Rowland*** (1,2), Anne **Thwaites** (2), Libby **Jared** (2)

(1: University of East Anglia; 2: University of Cambridge)

ANALYSING SECONDARY MATHEMATICS TEACHING WITH THE KNOWLEDGE QUARTET





Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 121

Session Chairs: Charalambous **Charalambous**, Xinrong **Yang**

Presentations: Heather **Hill***

(Harvard Graduate School of Education)

MEASURING SECONDARY TEACHERS' KNOWLEDGE OF TEACHING MATHEMATICS

Dragana **Martinovic*** (1), Agida **Manizade** (2)

(1: University of Windsor; 2: Radford University)

CONCEPTUALIZING KNOWLEDGE FOR TEACHING GEOMETRY AT
THE SECONDARY LEVEL

Lena **Schlesinger***, Armin **Jentsch**

(Universität Hamburg)

MEASURING INSTRUCTIONAL QUALITY IN MATHEMATICS EDUCATION

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 121

Session Chair: Ruhama **Even**

Presentations: Nicholas H. **Wasserman***

(Teachers College)

ACCOMMODATION OF TEACHERS' KNOWLEDGE OF INVERSE FUNCTIONS WITH
THE GROUP OF INVERTIBLE FUNCTIONS

Haode **Zuo***, Frederick K. S. **Leung**

(The University of Hong Kong)

SENIOR SECONDARY SCHOOL TEACHERS' HIGHER MATHEMATICS KNOWLEDGE
AND THE CLASSROOM INSTRUCTIONS IN CHINA

Ruhama **Even***

(Weizmann Institute of Science)

TEACHERS' VIEWS ON THE RELEVANCE OF ADVANCED MATHEMATICS STUDIES
TO SECONDARY SCHOOL TEACHING

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: D: yellow, West Wing Building, room 121

Session Chairs: Xinrong **Yang**, Ruhama **Even**

Presentations: Xinrong **Yang**

(Southwest University)

REFLECTION ON THE CONNECTIONS BETWEEN KNOWLEDGE AND PRACTICE OF
TEACHING MATHEMATICS

Nils **Buchholtz**

(Universität Hamburg)

SUMMARY OF THE DISCUSSION AND REFLECTIONS ON FURTHER PROGRESS

Charalmbos **Charalambous**

(University of Cyprus)

MEASURING, ASSESSING, AND EVALUATING KNOWLEDGE IN / FOR TEACHING
MATHEMATICS AT THE SECONDARY LEVEL: LOOKING BACK AND LOOKING FORWARD

TSG 47 – Pre-service mathematics education of primary teachers

Co-chairs: Keiko **Hino** (Japan), Gabriel **Stylianides** (UK)

Team members: Katja **Eilerts** (Germany), Caroline **Lajoie** (Canada), David **Pugalee** (USA)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: G: green, Social Science Building, room 29

Session Chair: Gabriel **Stylianides**

Presentations: Fou-Lai **Lin*** (1), Hui-Yu **Hsu** (2)

(1: National Taiwan Normal University; 2: National Hsinchu University of Education)

USING MATHEMATICS-PEDAGOGY TASKS TO FACILITATE PROFESSIONAL GROWTH OF ELEMENTARY PRE-SERVICE TEACHERS

Roland **Pilous*** (1,2), Timo **Leuders** (2), Christian **Rüede** (1,2)

(1: FHNW School of Education; 2: University of Education Freiburg)

INVESTIGATING THE RELATIONSHIP BETWEEN PROSPECTIVE ELEMENTARY TEACHERS' MATH-SPECIFIC KNOWLEDGE DOMAINS

Jane-Jane **Lo***

(Western Michigan University)

A SELF-STUDY OF INTEGRATING COMPUTER TECHNOLOGY IN A GEOMETRY COURSE FOR PROSPECTIVE ELEMENTARY TEACHERS

Ryan **Fox***

(Belmont University)

PRE-SERVICE ELEMENTARY TEACHERS GENERATION OF MULTIPLE REPRESENTATIONS TO WORD PROBLEMS INVOLVING PROPORTIONS

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: G: green, Social Science Building, room 29

Session Chair: Keiko **Hino**

Presentations: Skip **Fennell***

(McDaniel College)

PREPARING ELEMENTARY SCHOOL TEACHERS OF MATHEMATICS: A CONTINUING CHALLENGE

Marjolein **Kool*** (1), Ronald **Keijzer** (2)

(1: Hogeschool Utrecht; 2: Hogeschool iPabo)

DESIGNING NON-ROUTINE MATHEMATICAL PROBLEMS AS A CHALLENGE FOR HIGH-PERFORMING PROSPECTIVE TEACHERS

Eda **Vula***, Jeta **Kingji-Kastrati**

(University of Pristina)

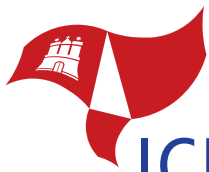
PRESERVICE TEACHERS' PROCEDURAL AND CONCEPTUAL UNDERSTANDING OF FRACTIONS

Meghan **Shaughnessy***, Timothy **Boerst**

(University of Michigan)

APPRAISING THE SKILLS FOR ELICITING STUDENT THINKING THAT PRESERVICE TEACHERS BRING TO TEACHER EDUCATION





Third Session: Friday, 29 July 2016, 12.00 – 13.30
Location: G: green, Social Science Building, room 29
Group A – Session Chair: Gabriel **Styliandes**

Presentations: Yusuke **Shinno*** (1), Tomoko **Yanagimoto** (1), Katsuhiro **Uno** (2)
(1: Osaka Kyoiku University; 2: Osaka University)

A STUDY OF PROSPECTIVE PRIMARY TEACHERS' ARGUMENTATION IN TERMS OF MATHEMATICAL KNOWLEDGE FOR TEACHING AND EVALUATING

Stephanie **Schuler***, Gerald **Wittmann**
(Pädagogische Hochschule Freiburg)

IMAGE VIGNETTES TO MEASURE PROSPECTIVE TEACHERS' BELIEFS ABOUT MATHEMATICS TEACHING AND LEARNING

Gönül **Güne** *

(Karadeniz Technical University)

THE MATHEMATICS BACKGROUNDS AND MATHEMATICS SELF-EFFICACY PERCEPTIONS OF PRE-SERVICE PRIMARY SCHOOL TEACHERS

Erik **Jacobson***, Fetiye **Aydeniz**, Mark **Creager**, Michael **Daiga**, Erol **Uzan**
(Indiana University)

DEVELOPING TOGETHER: MEASURING PROSPECTIVE TEACHERS' INTERTWINED, TOPIC-SPECIFIC KNOWLEDGE AND BELIEFS

Location: G: green, Social Science Building, room A215

Group B – Session Chair: Keiko Hino

Presentations: Derya **Çelik*** (1), Serhat **Aydın** (2), Zeynep Medine **Özmen** (1), Kadir **Gürsoy** (1), Duygu **Taskın** (1), Mustafa **Güler** (1), Gökay **Açıkyıldız** (1), Gönül **Güne** (1), Ramazan **Gürbüz** (3), Osman **Birgin** (4)

(1: Karadeniz Technical University; 2: Celal Bayar University; 3: Adıyaman University; 4: Usak University)
PRESERVICE MATHEMATICS TEACHERS' GAINS FOR TEACHING DIVERSE STUDENTS

Elisabeta **Eriksen** (1), Yvette **Solomon** (1,2), Camilla **Rodal** (1), Bjørn **Smestad*** (1), Annette Hessen **Bjerke** (1)

(1: Oslo and Akershus University College of Applied Sciences; 2: Manchester Metropolitan University)

THE DAY WILL COME WHEN I WILL THINK THIS IS FUN – FIRST-YEAR PRE-SERVICE TEACHERS' REFLECTIONS ON BECOMING MATHEMATICS

Oguzhan **Dogan***, Hülya **Kılıç**
(Yeditepe University)

LEARNING AND TEACHING WITH TEACHER CANDIDATES: AN ACTION RESEARCH FOR MODELING AND BUILDING FACULTY SCHOOL COOPERATION

Wenjuan **Li***, Alison Castro **Superfine**
(University of Illinois at Chicago)

UNDERSTANDING THE WORK OF MATHEMATICS TEACHER EDUCATORS: A KNOWLEDGE OF PRACTICE PERSPECTIVE

Topic Study Groups

TSG

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: G: green, Social Science Building, room 29

Session Chair: Gabriel **Styliandes**

Presentations: Caroline **Lajoie***

(Université du Québec à Montréal)

LEARNING TO ACT IN-THE-MOMENT: PROSPECTIVE ELEMENTARY TEACHERS' ROLEPLAYING ON NUMBERS

Pere **Ivars***, Ceneida **Fernández**

(Universidad de Alicante)

THE ROLE OF WRITING NARRATIVES IN DEVELOPING PRE-SERVICE PRIMARY TEACHERS NOTICING

Dittika **Gupta** (1), Melissa **Soto** (2), Lara **Dick*** (3), Shawn **Broderick** (4), Mollie **Appelgate** (5)

(1: Midwestern State University; 2: San Diego State University; 3: Bucknell University; 4: Keene State College; 5: Iowa State University)

NOTICING AND DECIDING THE "NEXT STEPS" FOR TEACHING: A CROSS-UNIVERSITY STUDY WITH ELEMENTARY PRE-SERVICE TEACHERS

TSG 48 – Pre-service mathematics education of secondary teachers

Co-chairs: Rongjin **Huang** (USA), Marilyn E. **Strutchens** (USA)

Team members: Leticia Losano (Argentina), Despina Potari (Greece), Björn Schwarz (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: G: green, Social Science Building, room 28

Session Chair: Despina **Potari**

Presentations: Joao Pedro **da Ponte***

(Instituto de Educação)

LESSON STUDIES IN PRESERVICE TEACHER EDUCATION

Alberto **Arnal-Bailera*** (1), Eva **Cid** (1), José M. **Muñoz-Escolano** (1), Antonio M. **Oller-Marcén** (2)

(1: Universidad de Zaragoza; 2: Centro Universitario de la Defensa de Zaragoza)

MARKING MATHEMATICS EXAMS AS A TOOL FOR SECONDARY TEACHER TRAINING

Péter **Juhász**, Anna **Kiss**, Ryota **Matsuura**, Réka Judit **Szász***

(Budapest Semesters in Mathematics Education)

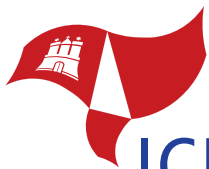
DEVELOPING TEACHER KNOWLEDGE IN PRESERVICE TEACHERS THROUGH PROBLEM SOLVING AND REFLECTION

Fou-Lai **Lin**, Kai-Lin **Yang**, Yu-Ping **Chang***

(National Taiwan Normal University)

DESIGNING A COMPETENCE-BASED ENTRY COURSE FOR PROSPECTIVE SECONDARY MATHEMATICS TEACHERS





Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: G: green, Social Science Building, room 28

Group A – Session Chair: Despina Potari

Presentations: Azita **Manouchehri***

(The Ohio State University)

INFUSING MATHEMATICAL MODELING IN TEACHER PREPARATION:
CHALLENGES AND OUTCOMES

Yu-Ping **Chang**, Kai-Lin **Yang***

(National Taiwan Normal University)

APOS THEORY APPLIED TO IDENTIFY KEY CHALLENGES FOR IMPROVING
PROSPECTIVE MATHEMATICS TEACHERS' TEACHING

Jung Sook **Park*** (1), Kukhwan **Oh** (1), Oh Nam **Kwon** (2)

(1: Yang Jae High School; 2: Seoul National University)

AN EXPLORATORY STUDY ON THE PROSPECTIVE TEACHERS' LESSON OF ANALYZING
MATH TEXTBOOKS

Ibrahim Burak **Olmez***, Andrew **Izsak**, Sybilla **Beckmann**

(The University of Georgia)

FUTURE TEACHERS' USE OF MULTIPLICATION AND FRACTIONS WHEN EXPRESSING
PROPORTIONAL RELATIONSHIPS

Location: G: green, Social Science Building, room 30

Group B – Session Chair: Leticia Losano

Presentations: Márcia Cristina **de Costa** Trindade **Cyrino***

(Universidade Estadual de Londrina)

TEACHER PROFESSIONAL IDENTITY CONSTRUCTION IN PRE-SERVICE MATHEMATICS
TEACHER EDUCATION: ANALYSING A MULTIMEDIA CASE

Belinda Pickett **Edwards***, Desha **Williams**

(Kennesaw State University)

PRE-SERVICE MATHEMATICS TEACHERS' EXPERIENCES DEVELOPING A CULTURALLY
RESPONSIVE TEACHER IDENTITY

Gregory Stephen Colin **Hine***

(The University of Notre Dame Australia)

EXPLORING PRE-SERVICE TEACHERS' SELF-PERCEPTIONS OF READINESS TO TEACH
MATHEMATICS

Rina **Durandt***, Gerrie J. **Jacobs**

(University of Johannesburg)

PRE-SERVICE TEACHERS' ATTITUDES TOWARDS MATHEMATICAL MODELLING

Topic Study Groups

TSG

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: G: green, Social Science Building, room 28

Group A – Session Chair: Marilyn Strutchens

Presentations: Blake E. **Peterson***, Keith R. **Leatham**
(Brigham Young University)

THE STRUCTURE OF STUDENT TEACHING CAN CHANGE THE FOCUS TO STUDENTS' MATHEMATICAL THINKING

W. Gary **Martin***, Marilyn E. **Strutchens**
(Auburn University)

TRANSFORMING SECONDARY MATHEMATICS TEACHER PREPARATION VIA A NETWORKED IMPROVEMENT COMMUNITY

Ahmet Oguz **Akcay***, Melissa **Boston**
(Duquesne University)

AN EXAMINATION OF PRE-SERVICE MATHEMATICS TEACHERS' INTEGRATION OF TECHNOLOGY INTO INSTRUCTIONAL ACTIVITIES

Despina **Potari*** (1,2), Giorgos **Psycharis** (1)

(1: National and Kapodistrian University of Athens; 2: Linneaus University)

PROSPECTIVE MATHEMATICS TEACHERS' ARGUMENTATION WHILE INTERPRETING CLASSROOM INCIDENTS

Location: G: green, Social Science Building, room 30

Group B – Session Chair: Rongjin **Huang**

Presentations: Rose Mary **Zbiek***
(The Pennsylvania State University)

FRAMING SECONDARY MATHEMATICS TEACHER UNDERSTANDING

Tingyan **Zhang***
(Southwest University)

AN INVESTIGATION OF PRE-SERVICE MATHEMATICS TEACHERS' TECHNOLOGY PEDAGOGICAL CONTENT KNOWLEDGE IN CHINA

Mar **Moreno***, Salvador **Llinares**
(UNIVERSITY OF ALICANTE)

PROSPECTIVE SECONDARY MATHEMATICS TEACHERS' PERSPECTIVES ABOUT THE USE OF TECHNOLOGY FOR SUPPORTING THE MATHS LEARNING

Yingkang **Wu***
(East China Normal University)

PROMOTING PRE-SERVICE SECONDARY MATHEMATICS TEACHERS' LEARNING TO TEACH MATHEMATICS: A VIDEO-BASED APPROACH

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

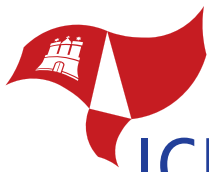
Location: G: green, Social Science Building, room 28

Session Chair: Marilyn **Strutchens**

Presentations: Hulya **Kilic***
(Yeditepe University)

PRE-SERVICE TEACHERS' REFLECTION ON THEIR TEACHING





Matthias **Heinrich***

(Universität Oldenburg)

CONSEQUENCES FROM THE LEARNING LEVEL OF STUDENTS FOR THE LESSON PLANNING IN MATHEMATICS

Christa DeAnn **Jackson*** (1), Magaret **Mohr-Schroeder** (2)

(1: Iowa State University; 2: University of Kentucky)

INCREASING STEM LITERACY VIA AN INFORMAL LEARNING ENVIRONMENT

Leticia **Losano***, Mónica **Villarreal**

(Consejo nacional de investigaciones Científicas y Técnicas – Facultad de Matemática)

PROSPECTIVE TEACHERS WORKING TOGETHER BEFORE AND DURING THEIR FIRST TEACHING PRACTICES

TSG 49 – In-service education and professional development of primary mathematics teachers

Co-chairs: Akihiko **Takahashi** (USA), Leonor **Varas** (Chile)

Team members: Toshiakira **Fuji** (Japan), Kim **Ramatlapana** (Botswana), Christoph **Selter** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2098/2194

Session Chair: Kim **Ramatlapana**

Presentations: Akihiko **Takahashi***

(DePaul University)

COLLABORATIVE LESSON RESEARCH (CLR)

Stéphane **Clivaz*** (1), Aoibhinn Ní **Shúilleabháin** (2)

(1: Lausanne Laboratory Lesson Study; 2: School of Mathematics & Statistics)

DEVELOPING MATHEMATICAL KNOWLEDGE FOR TEACHING IN LESSON STUDY: PROPOSITIONS FOR A THEORETICAL FRAMEWORK

Toshiakira **Fujii***

(Tokyo Gakugei University)

LESSON PLANNING IN JAPANESE ELEMENTARY SCHOOL LESSON STUDY

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2098/2194

Group A – Session Chair: Akihiko **Takahashi**

Presentations: Hamsa **Venkat** (1), Mike **Askew*** (1), Lawan **Abdulhamid** (1), Samantha **Morrison** (1), Kim **Ramatlapana** (2)

(1: University of the Witwatersrand; 2: University of Johannesburg)

A MEDIATIONAL APPROACH TO EXPANDING IN-SERVICE PRIMARY TEACHERS' MATHEMATICAL DISCOURSE IN INSTRUCTION

Topic Study Groups

TSG

Georgia Ann **Cobbs*** (1), Gregory **Chamblee** (2), Jennifer **Luebeck** (3)
(1: University of Montana; 2: Georgia Southern University; 3: Montana State University)
ENHANCING IN-SERVICE ELEMENTARY MATHEMATICS TEACHERS' CONTENT
KNOWLEDGE: A DISCUSSION OF TWO U.S. MSP PROJECTS

Nicole **Panorkou*** (1), Jennifer L. **Kobrin** (2)
(1: Montclair State University; 2: Research & Innovation Network)
ENHANCING TEACHERS' FORMATIVE ASSESSMENT PRACTICES: USING LEARNING
TRAJECTORIES IN PROFESSIONAL DEVELOPMENT

Dovie **Kimmins***, Rongjin **Huang**, Jeremy **Winters**, Kristin **Hartland**
(Middle Tennessee State University)
IN-SERVICE TEACHERS' PERCEPTIONS AND INTERPRETATIONS OF A LEARNING
TRAJECTORY: DIVISION OF FRACTIONS

Location: E: mint, Economical Building, room 2095/2197

Group B – Session Chair: Christoph **Selter**

Presentations: Cynthia Seto* (1), Mei Yoke Loh (2)
(1: Academy of Singapore Teachers / MOE; 2: Curriculum Planning and Development Division / MOE)
MENTORING AND MATHEMATICS TEACHER NOTICING:
ENHANCING TEACHER KNOWLEDGE

Armando **Peri*** (1,2,3), Carmen Gloria **Espinoza** (1,2), Lisa **Darragh** (3)
(1: University of Chile; 2: Center for Mathematical Modelling;
3: Center for Advanced Research in Education)
QUESTIONS AND QUALITY OF CLASSROOM INSTRUCTION OF MATH AFTER
A PROFESSIONAL DEVELOPMENT

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2098/2194

Group A – Session Chair: Leonor **Varas**

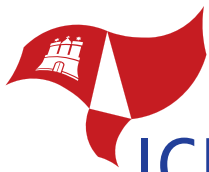
Presentations: Salome **Martinez***, Leonor **Varas**
(Universidad de Chile)
ON THE DEVELOPMENT OF A COLLABORATIVE PARTNERSHIP MODEL INVOLVING
IN-SERVICE TEACHERS AND RESEARCHERS

Engin **Ader***
(Bogazici University)
INVESTIGATING CLASSROOM TEACHERS' DEVELOPMENT OF QUALITY OF
IMPLEMENTATION OF MATHEMATICAL TASKS

Flavio **Guiñez***, Salomé **Martínez**
(Universidad de Chile)
A B-LEARNING APPROACH TO DEVELOPING MATHEMATICAL KNOWLEDGE FOR
TEACHING FOR IN-SERVICE PRIMARY SCHOOL TEACHERS

M. Victoria **Martínez***, Leonor **Varas**
(University of Chile)
IDENTIFYING ELEMENTS OF TEACHERS' CHANGE IN A PROFESSIONAL
DEVELOPMENT EXPERIENCE





Location: E: mint, Economical Building, room 2095/2197

Group B – Session Chair: Akihiko **Takahashi**

Presentations: Florence Anne **Glanfield*** (1), Joyce **Mgombelo** (2), Elaine **Simmt** (1), Andrew **Binde** (3)
(1: University of Alberta; 2: Brock University; 3: University of Dodoma)

PRIMARY MATHEMATICS TEACHER DEVELOPMENT IN RURAL COMMUNITIES:
LESSONS LEARNED FROM AN INTERNATIONAL RESEARCH PARTNERSHIP

Julie M. **Amador** (1), Cory A. **Bennett*** (2), Christine **Avila** (3)

(1: University of Idaho; 2: Idaho State University; 3: Fresno Pacific University)

UNDERSTANDING RURAL TEACHERS' PERCEIVED NEEDS AND CHALLENGES IN
CREATING RICH LEARNING ENVIRONMENTS

Liora **Nutov*** (1), Atara **Sriki** (2)

(1: Gordon Academic College and Technion; 2: Oranim College)

TEACHER AND STUDENTS AS A COLLABORATIVE INQUIRY LEARNING COMMUNITY:
A MEANS FOR TEACHERS' PROFESSIONAL DEVELOPMENT

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: E: mint, Economical Building, room 2098/2194

Session Chair: Toshiakira **Fujii**

Presentations: Debbie **Morgan***

(The National Centre for Excellence in the Teaching of Mathematics)

TEACHING FOR MASTERY A STRATEGY FOR IMPROVING ATTAINMENT IN
MATHEMATICS IN ENGLISH PRIMARY SCHOOLS

Christoph **Selter***

(TU Dortmund)

THE PIKAS PROJECT – USING KNOWLEDGE GAINED FROM IMPLEMENTATION,
SCHOOL DEVELOPMENT & IN-SERVICE TEACHER TRAINING RESEARCH

Jónína Vala **Kristinsdóttir***

(University of Iceland)

CO-LEARNING PARTENERSHIP IN MATHEMATICS TEACHER IN-SERVICE EDUCATION

Analucia Dias **Schliemann*** (1), David William **Carraher** (2), Montserrat **Teixidor-i-Bigas** (1)

(1: Tufts University; 2: TERC)

TEACHER DEVELOPMENT AND STUDENT LEARNING

TSG 50 – In-service education, and professional development of secondary mathematics teachers

Co-chairs: Jill **Adler** (South Africa), Yudong **Yang** (China)

Team members: Hilda **Borko** (USA), Konrad **Krainer** (Austria), Sitti **Patahuddin** (Australia)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall B

Session Chairs: Jill **Adler**, Yudong **Yang**

PANEL DISCUSSION

Topic Study Groups

TSG

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall B

Group A – Session Chair: Sitti **Patahuddin**

Presentations: Ronnie **Karsenty**, Gil **Schwartz***
(Weizmann Institute of Science)

ENHANCING REFLECTIVE SKILLS OF SECONDARY MATHEMATICS TEACHERS
VIA VIDEO-BASED PEER DISCUSSIONS: A CROSS-CULTURAL STORY

Cathrine **Kazunga***, Sarah **Bansilal**
(University of Kwa-Zulu Natal)

THE CHALLENGES OF UPGRADING MATHEMATICS TEACHERS:
A CASE STUDY FROM ONE DEVELOPING COUNTRY

Susanne **Schnell***
(University of Cologne)

TEACHERS NOTICING STUDENTS' POTENTIALS WHILE ANALYSING VIDEO CLIPS

Müjgan **Baki***

(Karadeniz Technical University)

DEVELOPMENT OF MATHEMATICAL KNOWLEDGE FOR TEACHING OF MATHEMATICS
TEACHERS IN LESSON ANALYSIS PROCESS

Location: C: turquoise, Main Building, lecture hall K

Group B – Session Chair: Yudong **Yang**

Presentations: Uffe Thomas **Jankvist*** (1), Mogens **Niss** (2)

(1: Aarhus University; 2: Roskilde University)

FOSTERING AN INTIMATE INTERPLAY BETWEEN RESEARCH AND PRACTICE:
DANISH "MATHS COUNSELLORS" FOR UPPER SECONDARY SCHOOL

Marta **Kobiela***, Annie **Savard**, Scosha **Merovitz**, Vandana **Chandrasekhar**
(McGill University)

OPPORTUNITIES FOR LEARNING OF SECONDARY MATH TEACHER LEADERS IN THE
CONTEXT OF A VIDEO CLUB

Ada **Boufi***

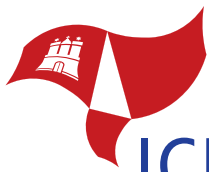
(National and Kapodistrian University of Athens)

DISTRICT COACHES FACILITATING TEACHERS' USE OF INQUIRY-ORIENTED MATH
TEXTBOOKS: A PROFESSIONAL DEVELOPMENT DESIGN STUDY

Corinne Rose **Glennie***, Bárbara **Brizuela**
(Tufts University)

THE ROLE OF FACILITATOR FEEDBACK IN SHAPING TEACHER ATTENTION AND
RESPONSE TO STUDENT THINKING





Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall B

Group A – Session Chair: Jill Adler

Presentations: Ulla B. Ch. Runesson **Kempe***
(Jönköping University)

LEARNING STUDY AND THE IDEA OF VARIATION AND CRITICAL ASPECTS OF LEARNING

Erlina **Ronda***

(University of the Philippines)

SUPPORTING TEACHERS IN AMBITIOUS MATHEMATICS TEACHING

Lisa Karin **Österling***

(Stockholm University)

(IN)VISIBLE THEORY IN MATHEMATICS TEACHER EDUCATION

Mary Grace **Stevenson***

(Liverpool Hope University)

DEVELOPING MATHEMATICAL IDENTITY AND 'UNDERSTANDING MATHEMATICS IN DEPTH': CONCEPTIONS OF SECONDARY MATHEMATICS TEACHERS

Location: C: turquoise, Main Building, lecture hall K

Group B – Session Chair: Hilda **Borko**

Presentations: Margaret Louise **Niess***, Henry **Gillow-Wiles**
(Oregon State University)

PEDAGOGICAL EXPLORATIONS INTEGRATED WITH PRACTICAL EXPERIENCES
TRANSFORMING TEACHERS' KNOWLEDGE

Marianna **Bosch*** (1), Berta **Barquero** (2), Avenilde **Romo** (3)

(1: IQS School of Management; 2: Dep. Didactics of Natural Science and Mathematics; 3: CICATA-IPN)

AN ONLINE COURSE FOR INSERVICE MATHEMATICS TEACHERS AT SECONDARY LEVEL
ABOUT MATHEMATICAL MODELLING

Sitti Maesuri **Patahuddin***, Tom **Lowrie**

(University of Canberra)

VIRTUAL ETHNOGRAPHIC INTERVENTION THROUGH FACEBOOK GROUP:
A CASE STUDY IN A DISADVANTAGED CONTEXT

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: C: turquoise, Main Building, lecture hall B

Session Chair: Konrad **Krainer**

Presentations: Thomas M. **Smith*** (1), Hilda **Borko** (2), Paola **Sztajn** (3)

(1: University of California; 2: Stanford University; 3: North Carolina State University)

ATTENDING TO CONTEXT WHEN DESIGNING MATHEMATICS PROFESSIONAL
DEVELOPMENT WITH SCALE IN MIND

Stefan **Zehetmeier***

(University of Klagenfurt)

RESEARCHING THE SUSTAINABILITY OF PROFESSIONAL DEVELOPMENT
PROGRAMMES

Craig **Pournara***

(University of the Witwatersrand)

IMPROVING TEACHERS' MATHEMATICAL CONTENT KNOWLEDGE AND
THE IMPACT ON LEARNER ATTAINMENT

Fou-Lai **Lin**, Kai-Lin **Yang**, Ting-Ying **Wang***

(National Taiwan Normal University)

TRANSFORMATIVE CASCADE MODEL FOR MATHEMATICS TEACHER PROFESSIONAL
DEVELOPMENT

TSG 51 – Diversity of theories in mathematics education

Co-chairs: Tommy **Dreyfus** (Israel), Anna **Sierpiska** (Canada)

Team members: Stefan **Halverscheid** (Germany), Steve **Lerman** (UK), Takeshi **Miyakawa** (Japan)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 207

Session Chair: Stefan **Halverscheid**

Presentations: Anna **Sfard***

(The University of Haifa)

ON THE NEED FOR THEORY OF MATHEMATICS LEARNING AND THE PROMISE
OF "COMMONGNITION"

Cristina **Frade***

(Universidade Federal de Minas Gerais – UFMG)

THE SOCIAL CONSTRUCTION OF MATHEMATICS TEACHER'S IDENTITY:
RORTY'S PRAGMATISTIC PERSPECTIVE

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 207

Session Chair: Steve **Lerman**

Presentations: Ricardo **Cantoral***

(Cinvestav)

ORIGINS AND EVOLUTION OF THE SOCIOEPISTEMOLOGICAL PROGRAM IN
MATHEMATICS EDUCATION

Carolina Tamayo **Osorio***, Antonio **Miguel**

(Universidade Estadual de Campinas)

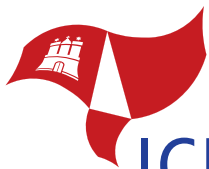
WITTGENSTEINIAN "THERAPEUTIC COUCH" AND INDIGENOUS EXPERIENCE IN
(MATHEMATICS) EDUCATION

Higinio **Dominguez***

(Michigan State University)

RECIPROCAL NOTICING IN MATHEMATICS CLASSROOMS WITH NON-DOMINANT
STUDENTS





Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 207

Session Chair: Takeshi **Miyakawa**

Presentations: Yasuhiro **Sekiguchi***

(Yamaguchi University)

THEORIES AND TRADITIONS: TENSIONS BETWEEN MATHEMATICS TEACHING PRACTICES AND A RECENT SCHOOL REFORM IN JAPAN

Verena **Rembowski***

(Saarland University)

SEMIOTIC AND PHILOSOPHICAL-PSYCHOLOGICAL ASPECTS OF CONCEPT FORMATION – UNITED

Stefan **Halverscheid***

(Georg-August-Universität)

AN EXAMPLE FOR INTERDISCIPLINARY NETWORKING OF THEORIES FOR THE DESIGN OF MODELLING TASKS: A CASE STUDY ON ETHICAL DILEM

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: H: orange, Educational Building, room 207

Session Chair: Alain **Kuzniak**

Presentations: Michèle **Artigue***

(University Paris Diderot – Paris 7)

THE CHALLENGING DIVERSITY OF THEORIES IN MATHEMATICS EDUCATION

TSG 52 – Empirical methods and methodologies

Co-chairs: David **Clarke** (Australia), Alan **Schoenfeld** (USA)

Team members: Bagele **Chilisa** (Botswana), Paul **Cobb** (USA), Christine **Knipping** (Germany)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, room 1+2

Group A – Session Chair: Alan **Schoenfeld**

Presentations: Armin **Jentsch***, Lena **Schlesinger**

(University of Hamburg)

METHODOLOGICAL CHALLENGES IN MEASURING INSTRUCTIONAL QUALITY IN MATHEMATICS CLASSROOMS

Branchetti **Laura** (1), Chiara **Giberti*** (2), Bolondi **Giorgio** (3)

(1: University of Palermo; 2: University of Trento; 3: University of Bologna)

A TOOL FOR ANALYZING THE IMPACT OF THE FORMULATION ON THE PERFORMANCE OF STUDENTS ANSWERING TO A MATHEMATICAL ITEM

Todd M. **Milford*** (1), Kevin **Larkin** (2)

(1: University of Victoria; 2: Griffith University)

CLUSTER ANALYSIS: A NOVEL METHODOLOGICAL APPROACH TO DETERMINING QUALITY IN GEOMETRY APPS

Topic Study Groups

TSG

Location: K: purple, Law Building, room 9

Group B – Session Chair: Paul **Cobb**

Presentations: Enrique Garcia **Moreno-Esteva*** (1), Markku **Hannula** (2), Miika **Toivanen** (3)
(1: University of Helsinki and The English School; 2: University of Helsinki;
3: Finnish Institute of Occupational Health)

WHEN DOES VISUAL INFORMATION BECOME RELEVANT IN A DYNAMIC PROBLEM SOLVING TASK IN THE CLASSROOM? – AN EYE TRACKING STUDY

Man Ching Esther **Chan***, David John **Clarke**
(The University of Melbourne)

LEARNING RESEARCH IN A LABORATORY CLASSROOM

Na **Li***, Ida Ah Chee **Mok**
(China)

SOME ISSUES ON THE CODING OF CLASSROOM INTERACTION

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, room 1+2

Group A – Session Chair: Paul Cobb

Presentations: Minsung **Kwon***, Mark **Hoover**
(University of Michigan)

ISOLATING KEY COMPONENTS OF INSTRUCTION AS A BASIS FOR STUDYING TEACHING

Kara Jones **Jackson*** (1), Paul **Cobb** (2), Erin **Henrick** (2), Thomas **Smith** (3)
(1: University of Washington; 2: Vanderbilt University; 3: University of California)

INVESTIGATING AND SUPPORTING INSTRUCTIONAL IMPROVEMENT AT SCALE

Katherine **Roan***, Man Ching Esther **Chan**, Carmel **Mesiti**, David **Clarke**
(University of Melbourne)

TEACHERS AS RESEARCH PARTNERS: THE CONTRIBUTION OF TEACHER EXPERTISE TO EDUCATIONAL RESEARCH

Tomas **Højgaard***, Rune **Hansen**
(Aarhus University)

DIDACTICAL MODELLING

Location: K: purple, Law Building, room 9

Group B – Session Chair: Christine **Knipping**

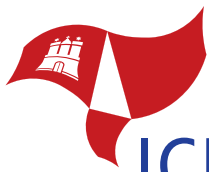
Presentations: Claudia **Corriveau*** (1), Nadine **Bednarz** (2)
(1: Université Laval; 2: Université du Québec à Montréal)

COLLABORATIVE RESEARCH IN MATHEMATICS EDUCATION:
APPROACHING QUESTIONS RELATED TO TEACHING PRACTICES

Janice B. **Fournillier***, Christine **Thomas**, Draga **Vidakovic**, Pier Junor **Clarke**
(Georgia State University)

METHODOLOGY AND EVALUATION RESEARCH: SECONDARY SCHOOL MATHEMATICS
TEACHERS' PERSPECTIVES ON PEDAGOGY AND PRACTICES





Sergio **Celis*** (1), Vilma **Mesa** (2)

(1: Universidad de Chile; 2: University of Michigan)

METHODOLOGICAL ISSUES IN STUDYING PRACTICAL RATIONALITY IN THE CONTEXT OF COMMUNITY COLLEGE MATHEMATICS

Helena **Grundén***

(Linnaeus University)

DIVERSITY IN MEANING AS AN ISSUE IN RESEARCH INTERVIEWS

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, room 1+2

Group A – Session Chair: Christine **Knipping**

Presentations: Fady El **Chidiac***

(University of California Berkeley)

A TECHNIQUE TO UNRAVEL ENTANGLED SUBJECT POSITIONS IN MATHEMATICS CLASSROOMS

Christine **Knipping***, Jenny **Cramer**

(Universität Bremen)

METHODOLOGICAL ISSUES RELATED TO RECONSTRUCTING PARTICIPATION IN ARGUMENTATION

Maria Pavlova, Maria **Shabanova***

(Northern (Arctic) Federal University named after M.V. Lomonosov)

THE EDUCATIONAL PROJECT "EXPERIMENTAL MATHEMATICS"

Abigail **Fregni Lins*** (1), Patricia **Sandalo Pereira** (2), Mercedes **Carvalho** (3)

(1: State University of Paraíba UEPB; 2: Federal University of Mato Grosso do Sul UFMS;

3: Federal University of Alagoas UFAL)

COLABORATIVE RESEARCH WORK PROJECT WITH TEACHERS WHO TEACH MATHEMATICS AT SCHOOL LEVEL IN THE NORTH EAST AND CENTER EAST

Location: K: purple, Law Building, room 9

Group B – Session Chair: David **Clarke**

Presentations: Ann Cathrice **George***, Alexander **Robitzsch**

(Institute for Educational Research)

DO INTERACTIONS MATTER IN THE END? A NEW PERSPECTIVE ON GENDER DIFFERENCES IN MATHEMATICAL SUB-COMPETENCIES

Tamar Apel **Campo***

(CimeH Institute)

"LET'S TALK MATH", DYNAMIC ASSESSMENT OF LEARNING PROCESSES IN MATHEMATICS METHODOLOGY

Alice **Lemmo***

(University of Palermo)

THE PROCESS OF MIGRATION FROM PAPER-BASED TO COMPUTER-BASED TEST: HOW STUDENTS APPROACH WITH MIGRATED TASK

Topic Study Groups

TSG

Claudia Regina **Flores***

(Federal University of Santa Catarina)

TOWARDS A CRITICAL EDUCATIONAL RESEARCH IN EDUCATION, MATHEMATICS AND ART

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: K: purple, Law Building, room 1+2

Session **Chairs:** Alan **Schoenfeld**, David **Clarke**

FRAMING GENERAL DISCUSSION AND SHARING OF WORKING GROUP DISCUSSIONS

TSG 53 – Philosophy of mathematics education

Co-chairs: Paul **Ernest** (UK), Ladislav **Kvasz** (Czech Republic)

Team members: Maria **Bicudo** (Brazil), Regina **Möller** (Germany), Ole **Skovsmose** (Denmark/Brazil)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 120

Session Chairs: Ladislav **Kvasz**, Ole **Skovsmose**

Presentations: Paul **Ernest***

(University of Exeter)

AN OVERVIEW OF THE PHILOSOPHY OF MATHEMATICS EDUCATION

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 120

Session Chairs: Paul **Ernest**, Ladislav **Kvasz**

Presentations: Ole **Skovsmose***

(Aalborg University)

POLITICS OF MEANING IN MATHEMATICS EDUCATION: SHORT VERSION

Maria **Bicudo***

(São Paulo State University – Brazil)

DEVELOPMENTS IN PHILOSOPHY IN/OF MATHEMATICAL EDUCATION:
ONTOLOGICAL QUESTIONS POSED BY THE PRESENCE OF COMPUTERS AND OT

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 120

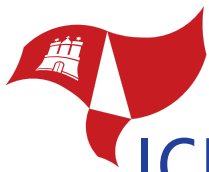
Group A – Session Chair: Paul **Ernest**

Presentations: Jeff **Evans*** (1), Keiko **Yasukawa** (2)

(1: Middlesex University; 2: University of Technology Sydney)

RESEARCHERS AS POLICY ACTORS? EXAMINING THE INTERACTION BETWEEN
MATHEMATICS EDUCATION RESEARCH AND PIAAC





TSG

Iskra **Nunez***

(The University of Nebraska-Kearney)

THEORETICAL INCOMPLETENESS AND MATHEMATICS EDUCATION

Nadia Stoyanova **Kennedy***

(Nadia Stoyanova Kennedy)

OPENING A PHILOSOPHICAL SPACE IN THE MATHEMATICS CURRICULUM

Cintia Aparecida Bento **Santos*** (1), Fernanda Aparecida **Ferreira** (2)

(1: UNICSUL/SP; 2: CEFET/MG)

POSSIBILITIES OF THE PHENOMENOLOGICAL APPROACH AND OF PHILOSOPHICAL HERMENEUTICS IN TYPE SEARCH STATE OF ART

Location: B: dark-brown, East Wing Building, room 124

Group B – Session Chair: Ladislav **Kvasz**

Presentations: Jörn **Schnieder*** (1), Ingrid **Scharlau** (2)

(1: Universität zu Lübeck; 2: Universität Paderborn)

READING MATHEMATICAL TEXTS WITH PHILOSOPHICAL METHODS

Uwe **Schürmann***

(Westfälische Wilhelms-Universität Münster)

THE ORDER OF THE DISCOURSE ON MODELLING

Michael **Meyer***

(University of Cologne)

CONCEPT FORMATION AS A RULE-BASED USE OF WORDS

Filipe Santos **Fernandes***

(Federal University of Minas Gerais)

HISTORY OF SCIENTIFIC AND ACADEMIC PRODUCTION IN MATHEMATICS EDUCATION: REPRESENTATION, INSTITUTION AND POLICY

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 120

Session Chairs: Paul **Ernest**, Maria **Bicudo**

Presentations: Ladislav **Kvasz***

(Charles University Prague)

LANGUAGE OF MATHEMATICS IN A HISTORICAL, EPISTEMOLOGICAL, AND EDUCATIONAL PERSPECTIVE

Regina **Möller***

(University of Erfurt)

THE TEACHING OF VELOCITY IN MATHEMATICS CLASSES – CHANCES FOR PHILOSOPHICAL IDEAS

TSG 54 – Semiotics in mathematics education

Co-chairs: Norma **Presmeg** (USA), Luis **Radford** (Canada)

Team members: Gert **Kadunz** (Austria), Luis **Puig** (Spain), Wolff-Michael **Roth** (Canada)

First Session: Tuesday, 26 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 121

Session Chairs: Wolff-Michael **Roth**, Jacinto Eloy Puig **Portal**

Presentations: Luis **Radford***

(Laurentian University)

THE ETHIC OF SEMIOSIS AND THE CLASSROOM CONSTITUTION OF MATHEMATICAL SUBJECTS

Adalira **Sáenz-Ludlow***

(University of North Carolina)

GEOMETRY EXAMPLES OF DIAGRAMMATIC REASONING

Gert **Kadunz***

(University of Klagenfurt)

A MATTER OF TRANSLATION

Second Session: Wednesday, 27 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 121

Session Chair: Luis **Radford**, Wolff-Michael **Roth**

Presentations: Wolff-Michael **Roth***

(University of Victoria)

BIRTH OF SIGNS: FROM TRIANGULAR SEMIOTICS TO COMMUNICATIVE FIELDS

Candia **Morgan***

(UCL Institute of Education)

USING SOCIAL SEMIOTICS TO EXPLORE INSTITUTIONAL ASSUMPTIONS ABOUT MATHEMATICS, STUDENTS AND TEACHERS

Michael **Otte***

(Universität Bielefeld)

SEMIOTICS, EPISTEMOLOGY AND MATHEMATICAL GENERALIZATION

Third Session: Friday, 29 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 121

Group A – Session Chair: Wolff-Michael **Roth**

Presentations: Ulises Alfonso **Salinas*** (1), José **Guzmán** (1), Isaias **Miranda** (2)

(1: Center of Research and Advanced Studies IPN; 2: IPN-CICATA)

ARTIFACT MEDIATION IN THE PROCESS OF OBJECTIFICATION

Osama **Swidan***, Naomi **Prusak**, Baruch **Schwarz**

(Hebrew University of Jerusalem)

OBJECTIFYING THE HIERARCHICAL CLASSIFICATION OF QUADRILATERALS IN A SYNCHRONIC – INTERACTIVE AND COLLABORATIVE COMPUTER





TSG

Debbie **Stott***

(Rhodes University)

GESTURING: A KEY ASPECT OF MEDIATION FOR YOUNG LEARNERS IN A SOUTH AFRICAN CONTEXT?

Alexander **Salle** (1), Christina M. **Krause*** (2)

(1: Osnabrück University (Germany); 2: University of Duisburg-Essen; 2: University of Duisburg-Essen)

ON THE ROLE OF GESTURES FOR THE DESCRIPTIVE ANALYSIS OF 'GRUNDTVORSTELLUNGEN': A CASE OF LINEAR FUNCTIONS

Location: B: dark-brown, East Wing Building, room 122

Group B – Session Chair: Gert **Kadunz**

Presentations: Corin Dessan **Mathews***

(Wits)

DIVISION MEANS LESS: CHAINS OF SIGNIFICATION IN A SOUTH AFRICAN CLASSROOM

Nejla **Gürefe***, Ahmet **Arıkan**

(Ahi Evran University)

ANALYSIS OF SEMIOTIC RESOURCES USED IN PROCESS OF HEARING-IMPAIRED STUDENTS' TRIANGLE CONCEPT EXPLANATION

Barbara M. **Kinach***

(Arizona State University)

DIGITAL VISUALIZATION TASKS FOR MATHEMATICS TEACHER DEVELOPMENT: A SEMIOTIC CHAINING ANALYSIS

Édith **Petitfour***

(LDAR)

TEACHING GEOMETRY TO VISUAL-SPATIAL DYSPRAXIC PUPILS

Fourth Session: Saturday, 30 July 2016, 12.00 – 13.30

Location: B: dark-brown, East Wing Building, room 121

Session Chairs: Luis **Radford**, Norma **Presmeg**

Presentations: Yasmine **Abtahi***

(University of Ottawa)

SEMIOTIC: SIGNS, TOOLS, AND MEANING-MAKING

Petra Margarete **Menz***, Nathalie **Sinclair**

(Simon Fraser University)

DIAGRAMMING AND GESTURING DURING MATHEMATIZING

José Francisco **Gutiérrez***

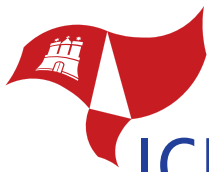
(University of Wisconsin)

EXPLORING TENSIONS IN THE "OBJ-SUBJ" DIALECTIC

Topic Study Groups

TSG





Oral Communications

TSG 1 – Early childhood mathematics education (up to age 7)

Co-chairs: Elia **Iliada** (Cyprus), Joanne **Mulligan** (Australia)

Team members: Ann **Anderson** (Canada), Anna Baccaglioni **Frank** (Italy), Christiane **Benz** (Germany)

OC

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: G: green, Social Science Building, room A411

Session Chairs: Iliada **Elia**, Anna Ethelwyn **Baccaglioni-Frank**

Presentations: Jean-Luc **Dorier***, Sylvia **Coutat** (University of Geneva)

CONCEPTUALIZING ORDER IN EARLY SCHOOL

Reinert Andre **Rinvold*** (Hedmark University College)

THE DIFFICULTY OF LEARNING THE FIRST THREE NUMEROSITIES

Kehinde Emmanuel **Adenegan***

(Adeyemi College of Education)

AN INVESTIGATION INTO THE WRITING AND COMPUTATIONAL SKILLS OF SCHOOL PUPILS OF AGE 3–6: IMPLICATIONS FOR EARLY CHILDHOOD

Elizabeth **Henning*** (1), Roelien **Herholdt** (2), Lara **Ragpot** (1), Lars **Balzer** (3), Antje **Ehlert** (4), Annemarie **Fritz-Stratmann** (5)

(1: University of Johannesburg; 2: JET Education Services; 3: Swiss Federal Institute for Vocational Education and Training; 4: University of Potsdam; 5: University of Duisburg-Essen)

TRANSLATING AND STANDARDISING A GERMAN ARITHMETICAL COMPETENCE TEST IN FOUR SOUTH AFRICAN LANGUAGES

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: G: green, Social Science Building, room A411

Session Chairs: Iliada **Elia**, Anna Ethelwyn **Baccaglioni-Frank**

Presentations: Simone Damm **Zogaib***, Thiarla Xavier Dal-Cin **Zanon**, José Carlos Thompson **da Silva** (Universidade Federal do Espírito Santo)

A SURVEY ON SPATIAL SENSE IN CHILDHOOD EDUCATION

Satoshi **Watanabe***

(Jissen Women's University)

RESEARCH ON THE STRATEGY USE OF YOUNG CHILDREN CONSTRUCTING A CUBE FROM FLAT PLANE SQUARES

Nicole **Fletcher*** (1), Herbert **Ginsburg** (2)

(1: Temple University; 2: Teachers College)

TEACHING SYMMETRY IN THE EARLY CHILDHOOD CLASSROOM: USING SOFTWARE TO PROMOTE UNDERSTANDING OF SYMMETRIC TRANSFORMATIONS

Elif **Karsli***

(TED University)

YOUNG CHILDREN'S EMBODIED MATHEMATICAL PRACTICES IN A PRE-K CLASSROOM

Dorota **Lembrér***, Maria C. **Johansson**
(Malmö University)

SWEDISH PRESCHOOL TEACHERS' VIEWS OF CHILDREN'S SOCIALISATION

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: G: green, Social Science Building, room A411

Session Chairs: Joanne **Mulligan**, Christiane **Benz**

Presentations: Audrey **Cooke***

(Curtin University)

PRE-SERVICE TEACHER RELATIONSHIPS WITH MATHEMATICS –
CREATIVE? ANXIOUS? COMPETENT?

Julia **Bruns*** (1), Lars **Eichen** (1), Sigrid **Blömeke** (2)

(1: Humboldt-Universität zu Berlin; 2: Centre for Educational Measurement)

PRE-SCHOOL TEACHERS' MATHEMATICS-RELATED COMPETENCIES

Lars **Jenßen*** (1), Katja **Eilerts** (2), Thomas **Koinzer** (2), Corinna **Schmude** (3), Sigrid **Blömeke** (4)

(1: Freie Universität Berlin; 2: Humboldt Universität zu Berlin; 3: Alice Salomon Hochschule Berlin;

4: University of Oslo)

DEVELOPMENT AND VALIDATION OF A TEST BATTERY ASSESSING PRESCHOOL
TEACHERS' PROFESSIONAL COMPETENCE IN THE FIELD OF MATHE

Trude **Fosse***, Magni Hope **Lossius**

(Bergen University College)

NORWEGIAN KINDERGARTENTeacher WORK WITH MATHEMATICS

Annemarie **Fritz-Stratmann*** (1,3), Moritz **Herzog** (1), Antje **Ehlert** (2,3)

(1: University of Duisburg-Essen; 2: University of Potsdam; 3: University of Jähnsburg)

FROM THOUGHT TO REALITY – IMPLEMENTATION OF AN IN-SCHOOL MATHEMATICS
TRAINING IN SOUTH AFRICA

Dina **Hassidov*** (1), Bat-Sheva **Ilany** (2)

(1: western galil College; 2: Beit-Berl College)

"SENSO-MATH" PRESCHOOL PROGRAM FACILITATORS CONTRIBUTE TO
MATHEMATICS EDUCATION IN THE PRESCHOOL

TSG 2 – Mathematics education at tertiary level

Co-chairs: Victor **Giraldo** (Brazil), Chris **Rasmussen** (USA)

Team members: Irene **Biza** (UK), Reinhard **Hochmuth** (Germany), Azimeh **Khakbaz** (Iran)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 9

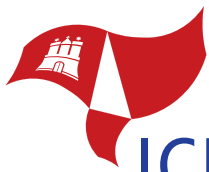
Group A – Session Chair: Chris **Rasmussen**

Presentations: Evangelia **Triantafyllou***, Olga **Timcenko**

(Aalborg University Copenhagen)

DIFFICULTIES IN MATHEMATICS EXPERIENCED BY STUDENTS IN A
TRANS-DISCIPLINARY ENGINEERING STUDY





Ryuichi **Mizumachi***

(Shonan Institute of Technology)

IDEAS OF MATHEMATICAL LITERACY FOR CULTIVATING STUDENTS' UNDERSTANDING OF CONCEPTS OF LINEAR ALGEBRA

María José **Beltrán-Meneu*** (1), Marina **Murillo-Arcila** (2)

(1: Universitat de València; 2: Universitat Politècnica de València)

A TASK DESIGN TO INTRODUCE THE CONCEPTS OF EIGENVECTORS AND EIGENVALUES – AN EMBODIED APPROACH

Robyn **Pierce**, Caroline **Bardini***

(The University of Melbourne)

DÉJÀ VU IN MATHEMATICS: WHAT DOES IT LOOK LIKE?

Location: K: purple, Law Building, room 7

Group B – Session Chair: Irene **Biza**

Presentations: Anne **D'Arcy-Warmington***

(Curtin University)

THE ART OF MATHEMATICAL CHATTER

Seyed Hadi Afzali **Borujeni***, Azimehsadat **Khakbaz**

(IPM)

WHY STUDENTS ARE NOT MOTIVATED TO LEARN MATHEMATICS?

Andrew Francis **Hare***

(Simon Fraser University)

"WHAT WE NEED TO SHOW IS THAT T IS WELL-DEFINED":

GESTURE AND DIAGRAM IN ABSTRACT ALGEBRA

Juliane **Püschl***

(University of Paderborn)

SCRIPTS IN MATHEMATICS TUTORIALS

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: K: purple, Law Building, room 9

Group A – Session Chair: Chris **Rasmussen**

Presentations: Aaron D. **Wangberg*** (1), Brian **Fisher** (2), Elizabeth **Gire** (3), Jason **Samuels** (4)

(1: Winona State University; 2: Lubbock Christian University; 3: Oregon State University;

4: City University of New York – BMCC)

A CASE STUDY ON THE IMPACT OF INVESTIGATING MULTIVARIABLE CALCULUS CONCEPTS THROUGH GEOMETRY AND MULTIPLE REPRESENTATION

Caroline Julia **Merighi***

(Tufts University)

STUDENT REASONING ABOUT FUNCTIONS, LIMITS, AND RATE OF CHANGE IN INTRODUCTORY CALCULUS

Jianren **Niu***, Liang **Yang**

(Sichuan University)

RESEARCH AND PRACTICE OF COLLEGE MATHEMATICS COURSE ASSESSMENT IN SICHUAN UNIVERSITY

Frank **Feudel***

(University of Paderborn)

HOW DO STUDENTS OF ECONOMICS UNDERSTAND THE CONCEPT OF MARGINAL COST?

Younes Karimi **Fardinpour***

(IAU)

ABOUT DOING GEOMETRIC APPROACH IN DIFFERENTIAL EQUATIONS:
DIFICULTIES AND A COHERENT METHOD

Fereshteh **Zeynivandnezhad***

(Organization for Educational and Research Planning)

INSTRUMENTAL ACTION SCHEMES IN DIFFERENTIAL EQUATIONS USING
A COMPUTER ALGEBRA SYSTEM, MAXIMA

Location: K: purple, Law Building, room 7

Group B – Session Chair: Irene **Biza**

Presentations: Chen **Li***, Chen **Chaodong**

(Sichuan University)

THE PRACTICE, GUARANTEE AND EFFECT ON THE SECOND CLASSROOM
PLATFORM IN UNIVERSITY MATHEMATICS TEACHING

Chao dong **Chen***, Jian ren **Niu**

(Sichuan University)

A COMPARATIVE STUDY OF UNIVERSITY STUDENTS' MATH ACHIEVEMENT OF
SMALL-CLASS TEACHING AND LARGE-CLASS TEACHING

Christina M. **Starkey***, Hiroko **Warshauer**, Max **Warshauer**

(Texas State University)

USING JOURNALS TO SUPPORT LEARNING: CASE OF NUMBER THEORY AND PROOF

Geraldo Claudio **Broetto** (1), Vânia Maria **Santos-Wagner*** (2)

(1: Instituto Federal do Espírito Santo; 2: Universidade Federal do Espírito Santo)

KNOWLEDGE OF RATIONAL AND IRRATIONAL NUMBERS OF TWO
UNDERGRADUATE STUDENTS

Elena G. **Yevsyeyeva***

(Donetsk National University)

THE ACTIVITY-BASED LEARNING OF MATHEMATICS IN A TECHNICAL HIGHER
EDUCATION INSTITUTION

Azimehsadat **Khakbaz***, Seyed Hadi Afzali **Borujeni**

(Bu Ali Sina University)

MOTIVATING UNIVERSITY STUDENTS TO LEARN MATHEMATICS

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 9

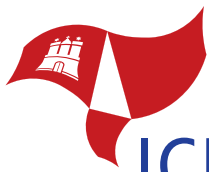
Group A – Session Chair: Victor **Giraldo**

Presentations: Jéssica de Aguiar **França***, Regina **da Silva Pina-Neves**, Raquel Carneiro **Dörr**

(Universidade de Brasília)

THE FUTURE OF MATHEMATICS TEACHING: ANALYSIS OF THE EXPECTATIONS
OF UNDERGRADUATES IN THE FEDERAL DISTRICT, BRAZIL





Ben **Davies***, Caroline **Yoon**, John Griffith **Moala**, Wes **Maciejewski**
(The University of Auckland)

PRINCIPLES FOR DESIGNING INVENTION TASKS FOR UNDERGRADUATE MATHEMATICS

Mitsuru **Kawazoe***, Masahiko **Okamoto**
(Osaka Prefecture University)

MEANINGFUL LEARNING IN MATHEMATICS EDUCATION FOR THE HUMANITIES
AND SOCIAL SCIENCES STUDENTS

Ignasi **Florensa*** (1), Marianna **Bosch** (2), Josep **Gascón** (3)
(1: EUSS; 2: IQS School of Management; 3: Univ. Autònoma de Barcelona)
LECTURER EDUCATION: A COURSE DESIGN

Location: K: purple, Law Building, room 7

Group B – Session Chair: Azimehsadat **Khakbaz**

Presentations: Weng Kin **Ho*** (1), Kok Ming **Teo** (1), Lu Pien **Cheng** (1), Puay San **Chan** (2)
(1: Nanyang Technological University; 2: Innova Junior College)

AN INVESTIGATION INTO THE EFFICACY OF FLIPPED CLASSROOM FOR
TERTIARY MATHEMATICS

Haitham S. **Solh***

(American University in Dubai)

INTERACTIVE VIDEOS: A 21ST CENTURY NECESSITY FOR STUDENT ENGAGEMENT

Chantal **Buteau***, Eric **Muller**

(Brock University)

SYSTEMIC INTEGRATION OF PROGRAMMING IN UNDERGRADUATE MATHEMATICS:
FROM IMPLEMENTATION TO THEORY

Laura Rose Margaret **Broley***

(Concordia University)

UNDERGRADUATE MATH STUDENTS' INTERACTIONS WITH PROGRAMMING:
DEVELOPING INSTRUMENTS IN INSTITUTIONS

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: K: purple, Law Building, room 9

Group A – Session Chair: Victor **Giraldo**

Presentations: Christoph **Neugebauer*** (1), Sebastian **Krusekamp** (1), Kathrin **Winter** (2)
(1: University of Münster; 2: University of Flensburg)

DEVELOPMENT OF DIAGNOSTIC SELF-ASSESSMENTS AS A BASE FOR
INDIVIDUAL SUPPORT FOR FIRST-YEAR STUDENTS

Tobias **Mai***, Silvia **Becher**

(University of Paderborn)

DIDACTICAL ELABORATION OF MULTIMEDIA LEARNING MATERIALS BY RECENT
TECHNOLOGICAL ADVANCEMENTS EXEMPLIFIED BY COMPUTER AID

Yoshitaka **Nakakoji***, Rachel **Wilson**

(The University of Sydney)

EXPLORATION OF TRANSFER OF FIRST YEAR UNDERGRADUATE MATHEMATICAL
LEARNING TO SCIENCE

William **Crombie***
(The Algebra Project)
THE ALGEBRA-TO-CALCULUS TRANSITION

Robin **Göller***
(Universität Kassel)
WHAT FIRST YEAR UNIVERSITY STUDENTS' RECOMMENDATIONS FOR FRESHMEN
REVEAL ABOUT THEIR LEARNING STRATEGIES

Michael Surman **Jennings***, Merrilyn **Goos**, Peter **Adams**
(The University of Queensland)
ISSUES IN THE TRANSITION FROM SECONDARY TO TERTIARY MATHEMATICS

Location: K: purple, Law Building, room 7

Group B – Session Chair: Reinhard **Hochmuth**
Presentations: Frode **Rønning***
(Norwegian University of Science and Technology)
CHALLENGES INVOLVED WHEN REFORMING TRADITIONAL COURSES IN
MATHEMATICS FOR ENGINEERS

Joerg **Kortemeyer***, Rolf **Biehler**
(University of Paderborn)
ANALYSIS OF TYPICAL MATHEMATICAL COMPETENCES REQUIRED TO SOLVE
TASKS IN BASIC ENGINEERING COURSES

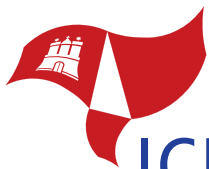
Robert Ivo **Mei***
(RWTH Aachen University)
TREE-STRUCTURED ONLINE EXERCISES IN MATHEMATICS FOR ENGINEERING
STUDENTS: DESIGN AND EVALUATION

Birgit **Griese***, Michael **Kallweit**
(Ruhr-Universität Bochum)
LEARNING BEHAVIOUR, ACADEMIC SUCCESS IN ENGINEERING MATHEMATICS,
AND LECTURERS' RATINGS

Ronja **Kürten***
(Westfälische Wilhelms-Universität Münster)
MATHEMATICAL SELF-EFFICACY OF ENGINEERING STUDENTS AT THE
INTRODUCTORY PHASE OF STUDIES

Birgit **Loch***, Wendy **Scott**, Michelle **Dunn**
(Swinburne University of Technology)
A PRELIMINARY ANALYSIS OF THE EFFECTIVENESS OF STUDENT-PRODUCED
VIDEOS ON THE RELEVANCE OF MATHEMATICS IN ENGINEERING





TSG 3 – Mathematics education in and for work

Co-chairs: Geoff **Wake** (UK), Diana **Coben** (New Zealand)

Team members: Burkhard **Alpers** (Germany), Keith **Weeks** (UK), Peter **Frejd** (Sweden)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 2053

Session Chair: Keith **Weeks**

Presentations: Bozena **Maj-Tatsis*** (1), Konstantinos **Tatsis** (2)

(1: University of Rzeszow; 2: University of Ioannina)

**CONSTRUCTING MATHEMATICAL PROBLEMS FOR ADVANCED
MANUFACTURING WORKERS**

Pamela **Vale***

(Rhodes University)

**DEVELOPING THE ABILITY TO USE MEASUREMENT CONCEPTS AND SKILLS
IN AND FOR WORK: THE VALUE OF COLLABORATIVE TASKS**

Linda **Galligan***

(University of Southern Queensland)

NURSING NUMERACY AND PROPORTIONAL REASONING

Jesús Omar Aldape **Carrillo***, Avenilde Romo **Vázquez**

(IPN / CICATA)

**A STUDY OF THE ROLE OF MATHEMATICS IN METROLOGY, THE CASE OF
AN AUTOMOBILE COMPANY**

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 2053

Session Chair: Peter **Frejd**

Presentations: Catherine **Byrne***, Michael **Carr**, Brian **Bowe**

(Dublin Institute of Technology)

ASSESSMENT AND ENGAGEMENT IN MATHS IN PRISON EDUCATION

Trude **Sundtjønn***

(Oslo and Akershus University College of Applied Sciences)

STUDENTS' TREATMENT OF AUTHENTICITY IN VOCATIONAL CONNECTED TASKS

Uwe **Schallmaier***, Maike **Vollstedt**, Duchhardt **Christoph**

(Universität Bremen)

MATHEMATICAL COMPETENCES, REQUIREMENTS AND JOB SATISFACTION

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 2053

Group A – Session Chair: Diana Cicely Coben

Presentations: Karolina **Muhrman***

(Linköping University)

**WHY SHOULD VOCATIONAL EDUCATION STUDENTS LEARN MATHEMATICS?
A WORKING LIFE PERSPECTIVE.**

Christoph **Duchhardt***, Maike **Vollstedt**
(University of Bremen)

USE OF MATHEMATICS AT WORK: THE CRUX OF SELF-REPORTS

Diane **Dalby***
(University of Nottingham)

VOCATIONAL STUDENTS AND MATHEMATICS IN THE TRANSITION TO WORK

TSG 4 – Activities for, and research on, mathematically gifted students

Co-chairs: Florence Mihaela **Singer** (Romania), Linda **Sheffield** (USA)

Team members: Matthias **Brandl** (Germany), Viktor **Freiman** (Canada), Kyoko **Kakihana** (Japan)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 2067/71

Session Chairs: Linda **Sheffield**, Matthias **Brandl**

Presentations: Jack Mathoga **Marumo***

(Central University of Technology)

ENRICHMENT FOR MATHEMATICALLY GIFTED LEARNERS

Benjamin **Rott*** (1), Maike **Schindler** (2)

(1: University of Duisburg-Essen; 2: Örebro University)

SORTING EXISTING THEORIES IN THE FIELD OF MATHEMATICAL GIFTEDNESS
ALONG TWO DIMENSIONS

Ralf **Benölken*** (1), Elisabet **Mellroth** (2)

(1: University of Münster; 2: Karlstad University)

MATHEMATICAL PROMISE AND FREQUENT CHARACTERISTICS OF MOTIVATIONAL
FACTORS WITH SWEDISH GIRLS AND BOYS

Yanyun **Liu***

(Malvern College Qingdao)

THE RESEARCH OF CHINESE HIGH SCHOOL STUDENTS' EFFICIENT
LEARNING MATHEMATICS

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 2067/71

Session Chairs: Florence Mihaela **Singer**, Viktor **Freiman**

Presentations: Stefanie **Winkler***, Matthias **Brandl**

(University of Passau)

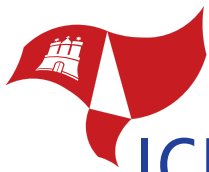
EMPIRICAL ANALYSIS OF MATHEMATICAL SKILLS AN POTENTIAL
GIFTEDNESS AT PRIMARY SCHOOL

Liyu **Zhang***

(East China Normal University)

SOME FEATURES OF SOLVING PROBLEMS OF GIFTED STUDENTS





Valentina **Gogovska***

(Faculty of Natural Sciences and Mathematics)

TASKS IN MATHEMATICS TEACHING AS AN OPPORTUNITY FOR FORMING
MATHEMATICAL SKILLS FOR GIFTED STUDENT

TSG 5 – Activities for, and research on, students with special needs

Co-chairs: Lourdes **Figueiras** (Spain), Rose **Griffiths** (UK)

Team members: Karen **Karp** (USA), Jens Holger **Lorenz** (Germany), Miriam Godoy **Penteado** (Brazil)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, lecture hall E

Group A – Session Chairs: Karen **Karp**, Rose **Griffiths**

Presentations: Eugenie **Kestel***, Helen **Forgasz**

(Monash University)

AN INVESTIGATION OF A TARGETED TUITION PROGRAM FOR STUDENTS
WITH MATHEMATICAL LEARNING DIFFICULTIES

Di **Liu***, Jianpan **Wang**

(East China Normal University)

MATHPROBLEM REPRESENTATION AND PROBLEM SOLVING OF 4TH GRADE
CHINESE STUDENTS WITH MATHEMATICS LEARNING DISABILITIES

Céline Vendeira **Maréchal***

(Université of Geneva)

THE RICHARD'S CASE OR "HOW TO OUTSMART ONE'S DIFFICULTIES"

Location: E: mint, Economical Building, room 4045/46

Group B – Session Chairs: Lourdes **Figueiras**, Miriam Godoy **Penteado**

Presentations: Michelle **Stephan*** (1), Akyuz **Didem** (2), Smith **Jennifer** (3)

(1: UNC Charlotte; 2: Middle East Technical University; 3: Seminole County Public Schools)

DIRECT OR INQUIRY INSTRUCTION FOR STUDENTS WITH SPECIAL NEEDS?
THE WRONG QUESTION

Sweeling **Leong*** (1), Walker **Zachary** (2), Lee **Nganhoe** (2)

(1: Dunman High School; 2: National Institute of Education)

EFFECTS OF A MATHEMATICS INSTRUCTIONAL SEQUENCE ON THE
CONCEPTUAL AND PROCEDURAL UNDERSTANDING OF ALGEBRIAC EXPRESSIONS

Natascha **Korff***

(University of Bremen)

HOW INCLUSIVE CLASSROOMS CAN IMPROVE THE QUALITY OF
MATHEMATICS TEACHING

Laurent **Theis*** (1), Teresa **Assude** (2), Jeanne **Koudogbo** (1), Karine **Millon-Fauré** (2),

Marie-Pier **Morin** (1), Jeanette **Tambone** (2)

(1: Université de Sherbrooke; 2: Université d'Aix-Marseille)

ANALYSIS OF AN AID SESSION FOR INTEGRATED AT-RISK STUDENTS DURING
MATHEMATICAL PROBLEM-SOLVING

Oral Communications

OC

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: E: mint, Economical Building, room 4045/46

Session Chairs: Karen **Karp**, Rose **Griffiths**

Presentations: John **Woodward***
(University of Puget Sound)

CHALLENGE OF PROPORTIONAL THINKING FOR STUDENTS WITH MATH DISABILITIES

Katherine Elizabeth **Lewis***
(University of Washington)

PARTITIONING AS THE GENERATIVE ROOTS OF FRACTION UNDERSTANDING:
A CASE STUDY OF A MATH LEARNING DISABILITY

Xenia **Lamprecht***

(University of Bamberg)

DESIGNING AND EVALUATING A SUPPORT-CONCEPT ON MULTIPLICATIVE
UNDERSTANDING

Yilmaz **Mutlu*** (1), Levent **Akgün** (2)

(1: Mus Alparslan University; 2: Ataturk University)

HOW DO COMPUTER AIDED INSTRUCTION MATERIALS INFLUENCE THE
APPROXIMATE NUMBER SYSTEM OF CHILDREN WITH MATHEMATICS LEARNIN

Arla **Westenskow*** (1), Patricia **Moyer-Packenham** (1), Barbara **Child** (2)

(1: Utah State University; 2: Logan City School District)

USING AN ICEBERG MODEL TO TARGET STUDENTS' DIFFICULTIES IN PLACE
VALUE UNDERSTANDINGS

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, lecture hall E

Group A – Session Chair: Rose **Griffiths**

Presentations: Elena **Gil*** (1), Ana María Millán **Gasca** (2)

(1: University of Zaragoza; 2: Università degli studi Roma Tre)

INTEGRATED ARITHMETIC AND GEOMETRY FOR DOWN SYNDROME CHILDREN

Steffen **Siegemund***

(Universität Hamburg)

COGNITIVE LEARNING PREREQUISITES AND TEACHING MATHEMATICAL
SKILLS TO STUDENTS WITH MODERATE INTELLECTUAL DISABILITY

Robyn **Ruttenberg-Rozen***

(York University)

LEVERAGING STRENGTHS: THE USE OF WONDER IN MATHEMATICS
AS AN INTERVENTION FOR A CHILD DIAGNOSED WITH ADHD

Location: E: mint, Economical Building, room 4045/46

Group B – Session Chairs: Lourdes **Figueiras**, Miriam Godoy **Penteado**

Presentations: Elena Alexandrovna **Sedova***, Sergey Alexeevich **Sedov**

(ISRO RAO)

LIMITS OF AVAILABILITY AND APPLICABILITY OF DIFFERENT ASPECTS
OF THE SCHOOL MATHEMATICAL EDUCATION





Edel Mary **Reilly*** (1), Kelly **George** (2)

(1: Indiana University of Pennsylvania; 2: Indiana Area Junior High School)

BUILDING DREAMS: HELPING STUDENTS WITH MATHEMATICAL LEARNING DIFFICULTIES ACHIEVE SUCCESS

Sarah **van Ingen***, Samuel **Eskelson**, David **Allsopp**

(University of South Florida)

PREPARING PROSPECTIVE TEACHERS TO ENGAGE IN MATHEMATICS CONSULTATIONS

Julie **Alderton*** (1), Sue **Gifford** (2)

(1: University of Cambridge; 2: University of Roehampton)

TEACHING CHILDREN WITH MATHEMATICS DIFFICULTIES: A PEDAGOGY OF DESENSITIVITY

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 4045/46

Session Chairs: Lourdes **Figueiras**, Miriam Godoy **Penteado**

Presentations: Amanda Queiroz **Moura***, Miriam Godoy **Penteado**

(Universidade Estadual Paulista – Unesp)

DEAF CHILDREN IN A LANDSCAPE OF MATHEMATICS INVESTIGATION

Elizabeth Becerra **Ramos***, Ricardo Quintero **Zazueta**

(Cinvestav- IPN)

CONDITIONAL EXPRESSIONS IN THE MEXICAN SIGN LANGUAGE

Annemiek **Van Leendert*** (1), Michiel **Doorman** (2), Paul **Drijvers** (2),

Johan **Pel** (3), Hans **Van Der Steen** (3)

(1: Royal Visio; 2: Utrecht University; 3: Erasmus University Medical Center)

READING AND COMPREHENDING ALGEBRAIC EXPRESSIONS BY SIGHTED AND BRAILLE-DEPENDENT STUDENTS

Christopher Adam Noel **Kurz***, Kim Lorraine **Kurz**

(Rochester Institute of Technology)

MATHEMATICAL LITERACY CITIZENSHIP: DEAF AND HARD-OF-HEARING EXPERIENCE

TSG 7 – Popularization of mathematics

Co-chairs: Christian **Mercat** (France), Patrick **Vennebush** (USA)

Team members: Chris **Budd** (UK), Carlota **Simões** (Portugal), Jens **Struckmeier** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, lecture hall A

Session Chair: Patrick **Vennebush**

Presentations: Fabrice **Planchon** (1), Nils **Berglund*** (2)

(1: Université de Nice; 2: Université d'Orléans)

IMAGES DES MATHÉMATIQUES, A WEBSITE DEDICATED TO CURRENT RESEARCH TOPICS FOR THE GENERAL PUBLIC

Jean-François **Nicaud*** (1), Jana **Trgalova** (2), Nataly **Essonnier** (2), Christophe **Viudez** (1)
(1: Aristod; 2: S2HEP laboratory)

TETRISQUIZ: GAMES FOR LEARNING MATHEMATICS

Andreas M. **Hinz***

(LMU Munich)

PUZZLES AND GRAPHS

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, lecture hall A

Session Chair: Chris **Budd**

Presentations: Tin Lam **Toh***, Lu Pien **Cheng**, Heng **Jiang**, Kam Ming **Lim**

(National Institute of Education singapore)

USE OF COMIC STORYTELLING IN TEACHING MATHEMATICS

Dudzile **Mkhize***

(University of Johannesburg)

TAPPING INTO ADOLESCENTS' MAIN CHARACTERISTICS TO

IGNITE MATHEMATICS INTEREST

TSG 8 – Teaching and learning of arithmetic and number systems (focus on primary education)

Co-chairs: Pi-Jen **Lin** (Chinese Taipei), Terezinha **Nunes** (UK)

Team members: Shuhua **An** (USA), Beatriz Vargas **Dorneles** (Brazil),

Elisabeth **Rathgeb-Schnierer** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: H: orange, Educational Building, room 106

Group A – Session Chair: Terezinha **Nunes**

Presentations: Johanna **Heitzer***

(RWTH Aachen)

PUNCH CARDS FOR PRIME FACTORIZATION –

A VERSATILE MANIPULATIVE FOR DEMONSTRATION AND INDIVIDUAL USE

Mun Yee **Lai***

(Flinders University)

CHINESE HONG KONG GRADE FOUR STUDENTS' KNOWLEDGE OF
DECIMAL NOTATION AND QUANTITIES

Herman Makabeteng **Tshesane***

(University of the Witwatersrand)

GRADE 4 SOUTH AFRICAN LEARNERS AND SUBTRACTION

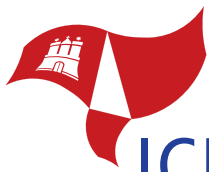
Swetlana **Nordheimer***, Ana **Donevska-Todorova**, André **Henning**

(Humboldt University)

IS THERE A LARGEST NUMBER OF ALL?

PUPILS' REFLECTIONS ON NATURAL NUMBERS





Location: H: orange, Educational Building, room 209

Group B – Session Chair: Beatriz **Vargas Dorneles**
Presentations: Lurdes **Serrazina***, Margarida **Rodrigues**
(Instituto Politécnico de Lisboa)

'DAY NUMBER': A PROMOTER ROUTINE OF FLEXIBILITY AND
CONCEPTUAL UNDERSTANDING

Renata **Carvalho***
(Instituto de Educação)
MENTAL COMPUTATION WITH RATIONAL NUMBERS:
STUDENTS MENTAL REPRESENTATIONS

Nicole Marie **Wessman-Enzinger***
(George Fox University)
CHILDREN'S VISUAL MEDIATORS FOR INTEGER ADDITION AND
SUBTRACTION OPEN NUMBER SENTENCES

Weimin **Ji***
(East China Normal University)
CHILDREN'S UNDERSTANDING OF SUBTRACTION WITH REGROUPING

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 106

Group A – Session Chair: Lieven **Verschaffel**
Presentations: Selahattin **Arslan*** (1), Oben **Karahan** (2)
(1: Karadeniz Technical University; 2: Erzincan University)
EPISTEMOLOGICAL OBSTACLES: THE CASE OF NEGATIVE NUMBER

Jin Chen* (1), Jing **Cheng** (2), Shuhua **An** (3), Weidong **Wu** (1)
(1: Zhejiang International Studies University; 2: East China Normal University;
3: California State University Long Beach)
COMPARATIVE STUDY ON THE COMPETENCY OF CLASSIFYING BETWEEN
CHINESE AND U.S. STUDENTS OF THE FIRST GRADE

Su-Chiao **Wu*** (1), Yu-Liang **Chang** (1), Fou-Lai **Lin** (2)
(1: National Chiayi University; 2: National Taiwan Normal University)
INQUIRY-BASED MATHEMATICS ACTIVITY DESIGNING FOR CHILDREN

Candelaria González **Polo*** (1), José David Toro **Vanegas** (2)
(1: Red de Investigadores Educativos En México [REDIEEM]; 2: Universidad Sin Fronteras [USF])
CHALLENGES PRESENTED IN MATHEMATICAL PROBLEMS RESOLUTION

Location: H: orange, Educational Building, room 209

Group B – Session Chair: Elisabeth **Rathgeb-Schnierer**
Presentations: Qinqiong **Zhang***
(College of Teacher Education)
TEACHING OF FRACTION IN ELEMENTARY SCHOOL BASED ON
UNDERSTANDING OF DIFFERENT SUB-CONSTRUCTS

Yu-Liang **Chang*** (1), Su-Chiao **Wu** (1), Jung-Kai **Wang** (2)
(1: National Chiayi University; 2: Kang-Ping Elementary School)

USING DIFFERENTIATED INSTRUCTION TO TEACH FIFTH-GRADERS FRACTIONS

Helena Gil **Guerreiro*** (1), Lurdes **Serrazina** (2)
(1: Instituto de Educação; 2: Escola Superior de Educação de Lisboa)

CONSTRUCTING RATIONAL NUMBERS' UNDERSTANDINGS – A TEACHING EXPERIENCE
AT PRIMARY SCHOOL

Sandra Gonçalves Vilas Bôas **Campos*** (1), Maria Lucia Lorenzetti **Wodewotzki** (2)
(1: Uberlândia Education City Department;

2: UNESP – Paulista State University “Júlio de Mesquita Filho”)
PIE CHARTS, AN ALTERNATIVE FOR CHILDREN IN LITERACY CYCLE
DEVELOP THE NUMBER SENSE

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: H: orange, Educational Building, room 106

Group A – Session Chair: Beatriz Vargas **Dorneles**

Presentations: Lisser Rye **Ejersbo***
(Aarhus University)

HANDS-ON MATERIALS AS INVITATION TO A FANTASY WORLD

Charita Abao **Luna***, Marife Valenton **Ubalde**, Rhoda Agdeppa **Namoco**
(MUST)

THE EFFECT OF GENERATIVE TEACHING MODEL ON GRADE VI PUPILS'
ARITHMETIC ACHIEVEMENT AND MATHEMATICS ANXIETY

Shirley Mary **Yates*** (1), Michelle **Coop** (2)

(1: Christian Brothers College; 2: Christian Brothers College)
MATHEMATICS INTERVENTION FOR LOW ACHIEVING MIDDLE
SCHOOL STUDENTS: REVERSING THE TREND

Zheng **Jiang*** (1,2), Jianhua **Li** (2), Ida A.C. **Mok** (1)
(1: The University of Hong Kong; 2: Beijing Normal University)

UNDERSTANDING LEVELS OF FRACTION'S MEASURE INTERPRETATION

Location: H: orange, Educational Building, room 209

Group B – Session Chair: Lin **Pi-Jen**

Presentations: Andrzej Ehrenfeucht* (1), Patricia Baggett (2)
(1: University of Colorado; 2: New Mexico State University)

TEACHING FRACTIONS USING COUNTING BOARDS

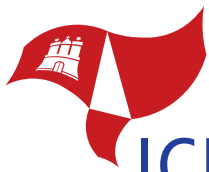
Thulelah Blessing **Takane***, Mike **Askew**
(University of the Witwatersrand)

TEACHING ADDITIVE RELATIONS IN SOUTH AFRICAN PRIMARY SCHOOLS

Anna **Kiss***

(Budapest Semesters in Mathematics Education)
NUMBER THEORY ON MARS – PRIME CARDS AND BEYOND





Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: H: orange, Educational Building, room 106

Session Chair: An **Shuhua**
Presentations: Hsiu-fei **Lee***
(National Taitung University)

THE KNOWLEDGE OF FRACTION DIVISION OF TAIWANESE SPECIAL
EDUCATION TEACHERS

Moshe Moses **Phoshoko***
(UNISA)

ENRICHING TEACHER SUBJECT MATTER KNOWLEDGE ON THE CONCEPT OF
ZERO IN THE CONTEXT OF TEACHING THE OPERATION OF SIGNED NUM

Cristina **Morais***, Lurdes **Serrazina**
(Instituto de Educação)

LEARNING RATIONAL NUMBERS IN THE EARLY YEARS:
THE ROLE OF REPRESENTATIONS AND THE DECIMAL NUMBERS

Sue **Gifford***

(University of Roehampton)

MAKING NUMBERS: DEVELOPING GUIDANCE ON THE USE OF MANIPULATIVES
IN LAYING THE FOUNDATIONS OF ARITHMETIC

TSG 9 – Teaching and learning of measurement (focus on primary education)

Co-chairs: Christine **Chambris** (France), Barbara **Dougherty** (USA)

Team members: Insook **Chung** (USA), Silke **Ruwisch** (Germany), (Ravi) K. **Subramaniam** (India)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: B: dark-brown, East Wing Building, room 233

Session Chairs: Insook **Chung**, Subramaniam **Kalyanasundaram**

Presentations: Silke **Ruwisch***
(Leuphana University Lueneburg)

THE EVALUATION OF ESTIMATED MEASUREMENTS

Hsin-Mei E. **Huang***

(University of Taipei)

INFLUENCE OF GRADE AND PROBLEM CHARACTERISTIC ON STUDENTS'
PERFORMANCE OF AREA ESTIMATION

Noemí **Pizarro***, Nuria **Gorgorió**, Lluís **Albarracín**

(Universitat Autònoma de Barcelona)

A CASE STUDY ABOUT AN ACTIVITY OF MEASUREMENT ESTIMATION OF VOLUME

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: B: dark-brown, East Wing Building, room 233

Session Chairs: Silke **Ruwisch**, Insook **Chung**
Presentations: Andrea **Osorio***, Oscar **Tamayo**
(Autonoma University of Manizales)

EXPLANATORY MODELS AND OBSTACLES IN THE LEARNING OF THE CONCEPT OF UNIT OF MEASUREMENT OF SPACE IN 5 GRADERS OF EL SCHOOL

Chap Sam **Lim*** (1), Liew Kee **Kor** (2), Carolyn Jia Ling **Sia** (1), Phei Ling **Tan** (1)
(1: Universiti Sains Malaysia; 2: Universiti Teknologi MARA Malaysia)
TEACHING THE TOPIC 'TIME' IN MALAYSIAN PRIMARY SCHOOLS: ISSUES AND CHALLENGES

Pedro **Palhares***, Sara **Ribeiro**
(University of Minho)
THE BISSEMIS IN THE TEACHING AND LEARNING OF AREA RELATED TOPICS

Cheng Meng **Chew***, Mohd Shafian **Shafiee**
(Universiti Sains Malaysia)
IMPROVING YEAR 4 PUPILS' PROFICIENCY IN AREA THROUGH THE CONCRETE-PICTORIAL-ABSTRACT APPROACH

Insook **Chung*** (1), JeongSuk **Pang** (2)
(1: Saint Mary's College; 2: Korea National University of Education)
INVESTIGATING KOREAN AND U.S. 3RD GRADERS' LENGTH MEASUREMENT CONCEPTS AND PROCESS SKILLS

TSG 10 – Teaching and learning of early algebra

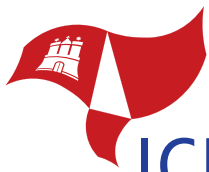
Co-chairs: Carolyn **Kieran** (Canada), JeongSuk **Pang** (Korea)
Team members: Swee Fong **Ng** (Singapore), Deborah **Schifter** (USA), Anna Susanne **Steinweg** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: I: blue, Philosophical Tower, lecture hall F

Group A – Session Chair: Deborah **Schifter**
Presentations: Sharon **McAuliffe***
(Cape Peninsula University of Technology)
PRESERVICE TEACHERS' MATHEMATICAL KNOWLEDGE FOR TEACHING EARLY ALGEBRA

Yuriko Yamamoto **Baldin*** (1), Danilo Eudes **Pimentel** (2), Jonas Marques **dos Santos Queiroz** (3)
(1: Universidade Federal de São Carlos; 2: Fundação Regional Educacional Avaré; 3: Instituto Educacional Estilo Campinas)
THE PRE-ALGEBRA ACTIVITIES IN TRANSITION YEARS FROM ARITHMETIC TO ALGEBRA IN BASIC EDUCATION





Nasim **Asghary***

(Islamic Azad University)

BUILDING ALGEBRAIC REASONING OPPORTUNITIES FOR ELEMENTARY STUDENTS: BECOMING A TASK DESIGNER TEACHER

Lorraine Frances **Day***, Derek Peter **Hurrell**

(University of Notre Dame Australia)

PROFESSIONAL LEARNING AS A VEHICLE TO PROMOTE TEACHERS' CONFIDENCE, ATTITUDES AND BELIEFS ABOUT ALGEBRA

Location: E: mint, Economical Building, room 2079

Group B – Session Chair: Swee Fong **Ng**

Presentations: Abraham **de la Fuente*** (1,2), Jordi **Deulofeu** (1)

(1: Universitat Autònoma de Barcelona (UAB); 2: Oak House School)

TRANSLATION BETWEEN LANGUAGE REPRESENTATION IN PROBLEM SOLVING AS A TOOL TO CONSTRUCT ALGEBRAIC LANGUAGE

Renato **Da Silva Ignácio** (1,3), Valdir Bezerra **Dos Santos Júnior*** (2,3), Marlene Alves **Dias** (3)

(1: Universidade Federal de Campina Grande; 2: Universidade Federal de Pernambuco; 3:

Universidade Anhanguera de São Paulo)

PERSONAL RELATIONSHIPS OF A SÃO PAULO STUDENTS GROUP ON ALGEBRA IN THE LIGHT OF THE ANTHROPOLOGICAL THEORY OF DIDACTICS

Jenna **Tague***

(California State University)

MODES OF RATE OF CHANGE REASONING IN THE MIDDLE GRADES

Sui Wah Betty **Tse***, Wing-yee Angela **Yung**

(China Victory Theological Seminary)

DISTRIBUTIVE PROPERTY – A GAP FROM ARITHMETIC TO ALGEBRA IDENTIFIED IN THE HONG KONG MATHEMATICS CURRICULUM

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 2079

Session Chair: Anna Susanne **Steinweg**

Presentations: Marios **Pittalis***, Demetra **Pitta-Pantazi**, Constantinos **Christou**

(University of Cyprus)

TRACING DEVELOPMENTAL PATTERNS IN STUDENTS' EARLY ALGEBRAIC ARITHMETIC THINKING

Marta **Molina** (1), Rebecca **Ambrose*** (2), Aurora **del Río** (3)

(1: University of Granada; 2: University of California-Davis; 3: University of Granada)

FIRST ENCOUNTER WITH LETTERS IN PRIMARY EDUCATION

Célia Maria **Mestre***

(Agrupamento de Escolas Romeu Correia)

SYMBOLIZING WITH MEANING IN COLLECTIVE DISCUSSIONS: A STUDY WITH 4 GRADE STUDENTS

Vera Lucia **Merlini**, Sandra **Magina***, Rogerio **Pires**, Cesar **Teixeira**
(Universidade Estadual de Santa Cruz)
ALGEBRAIC REASONING BEFORE LEARNING ALGEBRA IN SCHOOL

Antonio **Moreno*** (1), María C. **Cañadas** (1), Pilar **Jaldo** (1), Alfredo **Bautista** (2)
(1: University of Granada; 2: National Institute of Education (Singapore))
FUNCTIONAL TOPICS IN GRADE 5 STUDENTS' COMPARISONS
OF TWO LINEAR FUNCTIONS

Ulises **Xolocotzin***, Teresa **Rojano**
(Center for Research and Advanced Studies)
EXPLORING SYMBOL SENSE IN ELEMENTARY SCHOOL

Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: E: mint, Economical Building, room 2079

Session Chair: Deborah **Schifter**
Presentations: Katharine Bigelow **Sawrey*** (1), Bárbara M. **Brizuela** (1), Maria **Blanton** (2),
Angela **Murphy** Gardiner (2), Yangsook **Kim** (1), Aliska **Gibbins** (1)
(1: Tufts University; 2: TERC)
FOSTERING YOUNG STUDENTS' RELATIONAL UNDERSTANDING OF THE EQUAL SIGN

Giancarlo **Navarra***, Nicolina **Malara**
(University of Modena and Reggio Emilia (Italy))
TEACHERS' DIFFICULTIES ON APPROACHING EARLY ALGEBRA:
INTERFERENCES BETWEEN NEW CONCEPTIONS DECLARED AND CHANGE IN DIDACT

Monica M. **Neagoy***
(Monica Neagoy Mathematics Consulting)
HOW DO WE PLANT SEEDS OF ALGEBRA IN THE EARLY GRADES?

Daniela **Götze***
(Technische Universität Dortmund)
"IT'S NOTHING ELSE THAN A TERM" – THE EPISTEMIC ROLE OF LANGUAGE
WHILE GENERALIZING NUMERICAL PATTERNS

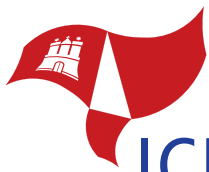
Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: E: mint, Economical Building, room 2079

Session Chair: Anna Susanne **Steinweg**
Presentations: Ralph **Schwarzkopf*** (1), Marcus **Nührenbörger** (2)
(1: Carl von Ossietzky Universität Oldenburg; 2: Technische Universität Dortmund)
ALGEBRAIC UNDERSTANDING OF EQUALITIES IN PRIMARY CLASSES

Rashmi **Singh***, Karl **Kosko**
(Kent State University)
EFFECT OF THE STRUCTURE OF THE MATHEMATICAL EQUIVALENCE
PROBLEMS ON STUDENTS' STRATEGY

Amir Hossein **Asghari** (1,2), Sharareh Taghi **Dastjerdi*** (2), Maryam Adeli **Sardoo** (2)
(1: Liverpool John Moore's university; 2: Isfahan Mathematics House)
MOVING FROM OPERATIONAL VIEW TO RELATIONAL VIEW ON THE HUNDRED GRID





Victoria **Kofman***
(Stella Academy)
PARAMETER-POINTERS IN EARLY ALGEBRA

Maria **Chimoni***
(University of Cyprus)
THE MULTIFACETED NOTION OF ALGEBRAIC THINKING IN THE CONTEXT
OF ELEMENTARY MATHEMATICS: INSIGHTS FROM EMPIRICAL DATA

TSG 11 – Teaching and learning of algebra

Co-chairs: Rakhi **Banerjee** (India), Amy **Ellis** (USA)
Team members: Helen Chick (Australia), Astrid Fischer (Germany), Heidi Strømskag Måsøval (Norway)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: I: blue, Philosophical Tower, room 761

Group A – Session Chair: Rakhi **Banerjee**
Julia **Meinke***
(Georg August Universität Göttingen)
TEACHERS' SUBJECTIVE THEORIES ON ALGEBRA – THE CASE OF VARIABLES

Olive **Chapman***
(University of Calgary)
MATHEMATICS TEACHERS' PERSPECTIVES OF INQUIRY-BASED TEACHING OF ALGEBRA

Süleyman **Tursucu***, Steven **Flipse**, Jeroen **Spandaw**, Marc **de Vries**
(Delft University of Technology)
TEACHERS' BELIEF SYSTEMS ABOUT IMPROVING TRANSFER OF ALGEBRAIC
SKILLS FROM MATHEMATICS INTO PHYSICS

Rubens Carlos Viriato **Júnior***, Raquel Carneiro **Dörr**, Jéssica **de Aguiar França**
(Universidade de Brasília)
PIBID PROGRAM AND ITS IMPORTANCE ON TEACHER EDUCATION IN BRAZIL:
AN EXPERIENCE IN BRASILIA

Location: I: blue, Philosophical Tower, room 764

Group B – Session Chair: Amy Ellis
Presentations: Tamara **Ogen***, Tamara **Avissar**, Orna **Schneiderman**
(Mofet Association)
IMPROVING MATHEMATICAL UNDERSTANDING AND PERFORMANCE

Wenjun **Zhao*** (1), Fuying **Wang** (2)
(1: The University of Hong Kong; 2: Center of Educational Research and Teacher Training)
TEACHING OF ALGEBRA IN A DJP MODEL CLASSROOM

Sonoda **Tsuyoshi***
(Doshisha Junior High School)
A PLAN OF TEACHING FACTORIZATION BY USING "AREA DIAGRAM" AND
"DIRECT PRODUCT TABLE" FOR SECONDARY SCHOOL STUDENTS

Kajsa **Bråting** (1), Kirsti **Hemmi** (2), Lars **Madej*** (1), Ann-Sofi **Røj-Lindberg** (2)
(1: Uppsala University; 2: Åbo Akademi University)
TOWARDS RESEARCH-BASED TEACHING OF ALGEBRA –
ANALYZING EXPECTED STUDENT PROGRESSION IN THE SWEDISH
CURRICULUM GRADES 1–9

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: I: blue, Philosophical Tower, room 761

Session Chairs: Rakhi **Banerjee**, Amy **Ellis**
Presentations: Reinhard **Oldenburg***
(University Augsburg)
NEWS FROM THE REVERSAL ERROR

Alessandro Jacques **Ribeiro***
(Federal University of ABC (UFABC))
A CONCEPTUAL PROFILE OF EQUATION: DEVELOPMENTS FOR TEACHING
AND LEARNING OF ALGEBRA

Peter **Kop*** (1), Fred **Janssen** (1), Paul **Drijvers** (2), Jan **Van Driel** (1)
(1: Iclon Leiden University; 2: Freudenthal Institute Utrecht University)
RECOGNITION AND HEURISTICS IN GRAPHING FORMULAS

Khiok Seng **Quek**, Yew Hoong **Leong***, Eng Guan **Tay**, Sook Fwe **Yap**, Cherng Luen **Tong**,
Hui Teck Clement **Lee**, Wei Yeng Karen **Toh**
(National Institute of Education)
ALGEBRA THAT MAKES SENSE AND THAT 'WORKS'

Riikka **Palkki***
(University of Oulu)
COMPARING RIGHT AND WRONG SOLUTIONS IN ALGEBRA

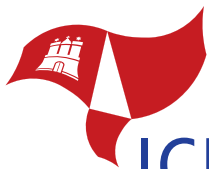
Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: I: blue, Philosophical Tower, room 761

Session Chair: Rakhi **Banerjee**
Presentations: Amy Jeanne **Hackenberg***, Robin **Jones**,
Rebecca **Borowski**, Sukanya **Suksak**
(Indiana University)
SEVENTH GRADE STUDENTS' MEANINGS OF DIVISION WITH WHOLE NUMBERS,
FRACTIONS, AND UNKNOWNNS

Juan D. **Godino** (1), Miguel R. **Wilhelmi** (2), Teresa **Neto** (3), Lilia **Aké** (1), Angel **Contreras** (4),
Antonio **Estepa** (4), Aitzol **Lasa*** (2)
(1: University of Granada; 2: Public University of Navarre;
3: University of Aveiro; 4: University of Jaen)
ALGEBRAIZATION LEVELS IN PRIMARY, MIDDLE AND HIGH SCHOOL MATHEMATICS

Sybilla **Beckmann***, Andrew **Izsak**, Eun **Jung**, Ibrahim Burak **Olmez**
(University of Georgia)
FRACTIONAL MULTIPLIERS IN EQUATIONS FOR PROPORTIONAL RELATIONSHIPS





Andrea Dorila Cárcamo **Bahamonde*** (1,2), Josep María Fortuny **Aymemí** (2),
Joan Vicenç Gómez i **Urgellés** (3)

(1: Universidad Austral de Chile; 2: Universidad Autónoma de Barcelona;

3: Universidad dPolitécnica de Cataluña)

**INSTRUCTIONAL DESIGN BASED ON THE LEARNING TRAJECTORY:
A PROPOSAL FOR THE CONSTRUCTION OF LINEAR ALGEBRA CONCEPTS**

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: I: blue, Philosophical Tower, room 761

Session Chair: Amy **Ellis**

Presentations: Clement Onwu **Iji***, Godwin Aodohemba **Fiase**, Odihi **Adikwu**
(UNIVERSITY OF AGRICULTURE)

**UTILIZING VOCABULARY BUILDING INSTRUCTION TO IMPROVE TECHNICAL SCHOOL
STUDENTS' ACHIEVEMENT AND INTEREST IN ALGEBRA.**

Mamosa Mateboho Evodia **Ntsohi*** (1), Faaiz **Gierdien** (2)

(1: University of Witwatersrand; 2: University of Stellenbosch)

**LEARNING EARLY ALGEBRA THROUGH EXCEL SPREADSHEETS IN LESOTHO:
BENEFITS AND CHALLENGES**

Ludwig **Paditz***

(Dresden University of Applied Sciences)

**IMPROVEMENT OF STUDENTS' UNDERSTANDING OF ALGEBRA OF SETS
AND VENN-DIAGRAMS**

Kenneth Allen **Horwitz*** (1), Carolyn A. **Maher** (2)

(1: New Jersey Insitute of Technology; 2: Rutgers University)

**STUDENT USE OF REPRESENTATIONS IN SOLVING SURFACE AREA AND
VOLUME PROBLEMS**

TSG 12 – Teaching and learning of geometry (primary level)

Co-chairs: Sinan **Olkun** (Turkey), Ewa **Swoboda** (Poland)

Team members: Paola **Vighi** (Italy), Yuan **Yuan** (Chinese Taipei), Bernd **Wollring** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 564

Session Chair: Yuan **Yuan**

Presentations: Soohwan **Kim** (1), Eunjin **Kim*** (2)

(1: Cheongju National University of Education; 2: Biryong Elementary School)

**A CASE STUDY ON CULTIVATING CORE COMPETENCIES IN MATHEMATICS IN
A 3RD GRADE KOREAN CLASSROOM**

Sümeyye **Gürhan***, Ismail Özgür **Zembat**

(Mevlana (Rumi) University)

**A TECHNOLOGY-BASED INSTRUCTION FOSTERING STUDENTS' DEVELOPMENT
OF QUADRILATERAL HIERARCHY**

Madiha Hassan **Abdelrahman***

(Faculty of Education/ Beni-Suef University)

THE EFFECTIVENESS OF A SUGGESTED GEOMETRICAL TOOLS TO HELP BLIND PUPILS LEARNING CONSTRUCTIVE GEOMETRY

Yutaka **Kondo***

(Nara University of Education)

CHARACTERISTICS OF STUDENTS' 3D GEOMETRICAL REASONING IN ELEMENTARY SCHOOL

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: I: blue, Philosophical Tower, room 564

Session Chair: Sinan **Olkun**

Presentations: Simone **Reinhold**, Susanne **Wöller***

(Leipzig University)

CHILDREN'S CONCEPTUAL KNOWLEDGE ON CUBES AND CUBOIDS: INSIGHTS VIA BLOCK BUILDING ACTIVITIES

Francine **Athias***

(Université de Franche-Comté)

HOW TO EXPLAIN THE SAME LENGTH

Claire Marie-Claude **Guille-Biel Winder***

(ESPE de Nice)

LEARNING OF THE STUDENTS IN A REPRODUCTION OF FIGURE BY FOLDING

Ken-ichi **Iwase*** (1), Tomoko **Yanagimoto** (2), Masato **Inoue** (3), Taeko **Kunimitsu** (4), Ryo **Nakanishi** (5)

(1: Tennoji Senior High School attached to Osaka-Kyoiku University; 2: Osaka Kyoiku University; 3: Kobe Shinwa Women's University; 4: Tennoji Elementary School attached to Osaka Kyoiku University; 5: Ikeda Junior High School attached to Osaka Kyoiku Univer)

MATHEMATICAL KNOTS AS TEACHING MATERIAL TO IMPROVE STUDENT'S SPATIAL ABILITIES

Zeynep Akkurt **Denizli*** (1), Abdulkadir **Erdogan** (2), Sinan **Olkun** (3)

(1: Ankara University; 2: Anadolu University; 3: TED University)

THE DEVELOPMENT OF THREE-DIMENSIONALITY IN PRIMARY SCHOOL CHILDREN

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 564

Session Chair: Ewa **Swoboda**

Presentations: Tuba Aydogdu **Iskenderoglu*** (2), Elif **Aksan** (1)

(1: Karadeniz Technical University; 2: Karadeniz Technical University)

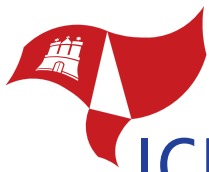
AN ANALYSIS OF THE DEFINITIONS BY STUDENT CLASSROOM TEACHERS ABOUT TWO-DIMENSION GEOMETRICAL CONCEPTS

Lina Maria **Brunheira*** (1), João Pedro **Ponte** (2)

(1: Escola Superior de Educação; 2: Instituto de Educação)

THE HIERARQUICAL CLASSIFICATION OF QUADRILATERALS – CHALLENGES FACED BY PROSPECTIVE ELEMENTARY TEACHERS





Xhevdet **Thaqi*** (1), Joaquim **Gimenez** (2)

(1: University of Gjilan "Kadri Zeka"; 2: University of Barcelona)

THE PROCES OF UNDERSTANDING OF GEOMETRICAL TRANSFORMATION
AS A FUNCTION

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: I: blue, Philosophical Tower, room 564

Session Chair: Paola **Vighi**

Presentations: Jill A. **Cochran*** (1), Zane **Cochran** (1,2), Meredith **Hopper** (1)

(1: Berry College; 2: Georgia Institute of Technology)

WILL IT PRINT? UNDERSTANDING DIMENSIONS WITH 3D PRINTING

Sylvia **Coutat***

(Université de Genève)

SHAPE RECOGNITION IN EARLY SCHOOL

Małgorzata **Zambrowska*** (1), Ewa **Swoboda** (2)

(1: Institute of Educational Research Poland; 2: University of Rzeszów)

STUDENTS' MENTAL MANIPULATION OF A SHAPE AT THE EARLY EDUCATIONAL LEVEL

Ajay **Ramful**, Tom **Lowrie***

(University of Canberra)

MENTAL ROTATION ABILITY OF 11–13 YEAR OLD STUDENTS:

A DEVELOPMENTAL PERSPECTIVE FROM A NOVEL INSTRUMENT

TSG 13 – Teaching and learning of geometry – secondary level

Co-chairs: Ui Hock **Cheah** (Malaysia), Patricio **Herbst** (USA)

Team members: Matthias **Ludwig** (Germany), Philippe **Richard** (Canada), Sara **Scaglia** (Argentina)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 0076a

Group A – Session Chair: Ui-Hock **Cheah**

Presentations: Vladimir Alekseevich **Smirnov***, Irina Mikhailovna **Smirnova**

(Moscow State Pedagogical University)

COMBINATORIAL PROBLEMS IN SCHOOL GEOMETRY

Rukiye **Ayan***, Mine **Isiksal-Bostan**

(Middle East Technical University)

MIDDLE SCHOOL STUDENTS' (MIS) INTERPRETATIONS OF LENGTH
TO VOLUME RELATIONSHIPS

Kalliopi **Siopi***, Eugenia **Koleza**

(University of Patras)

ARTIFACT BASED GEOMETRIC CONSTRUCTIONS

Location: E: mint, Economical Building, room 0078

Group B – Session Chair: Patricio G. **Herbst**

Presentations: Andrew Anthony **Hunte***

(University of Illinois at Urbana-Champaign)

GEOMETRY OPPORTUNITIES FOR REASONING AND PROOF IN SECONDARY SCHOOL TEXTBOOKS IN TRINIDAD AND TOBAGO

José Agustín **Villella***, Gema **Fioriti**, Alejandra **Almirón**, Susana Carmen **Ammann**,

Fernando **Bifano**, Rosa Ana **Ferragina**, Leonardo José **Lupinacci**

(Universidad Nacional de San Martín)

NOTES FOR THE TEACHING OF GEOMETRY IN SECONDARY SCHOOL: A TEACHER TRAINING EXPERIENCE

Gili Gal **Nagar***

(UMass Dartmouth)

TEACHERS' PROVING PROCESS IN DYNAMIC ENVIRONMENT: THE INSCRIBED ANGLE THEOREM

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 0076a

Session Chair: Philippe R. **Richard**

Presentations: Ming-Jang **Chen*** (1), Chun-Yi **Lee** (2)

(1: National Chiao Tung University; 2: National Taipei University)

CONTEXT INTEGRATION EFFECTS ON GEOMETRY LEARNING OF JUNIOR HIGH SCHOOL STUDENTS

Mitsue **Arai***

(Hiroshima University)

ASPECTS OF SPATIAL THINKING IN PROBLEM SOLVING: FOCUSING ON VIEWPOINTS IN CONSTRUCTING INTERNAL REPRESENTATION

Takuma **Takayama***

(Machida 1 Junior High School)

CENTER OF GRAVITY OF VARIOUS FIGURES

Luz Graciela Orozco **Vaca*** (1), Ricardo Quintero **Zazueta** (2)

(1: CINVESTAV; 2: CINVESTAV)

THE USE OF WRITING AS A METACOGNITIVE TOOL IN GEOMETRY LEARNING

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 0076a

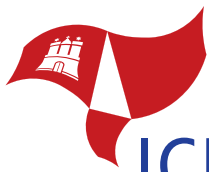
Session Chair: Patricio **Herbst**

Presentations: Fadime **Ulusoy***, Erdiņ **Çakiroglu**

(Middle East Technical University)

PROSPECTIVE TEACHERS' PERSONAL AND INSTRUCTIONAL DEFINITIONS FOR QUADRILATERALS





Richard **Walsh***, Olivia **Fitzmaurice**, John **O'Donoghue**

(Dept. of Mathematics and Statistics)

IRISH PRE-SERVICE TEACHERS' SUBJECT MATTER KNOWLEDGE OF
SECONDARY LEVEL TRIGONOMETRY

Shawnda Rae **Smith***

(Texas State University)

GEOMETRY TEACHING KNOWLEDGE: A COMPARISON BETWEEN
PRE-SERVICE AND HIGH SCHOOL GEOMETRY TEACHERS

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 0076a

Session Chair: Matthias **Ludwig**

Presentations: Chrysi **Papadaki***

(University of Bremen)

THE INTERPLAY BETWEEN VISUALIZATION AND ARGUMENTATION IN THE
TEACHING OF GEOMETRY

Neslihan **Bulut** (1), Sefa **Dündar*** (2), Mehmet **Eren** (1)

(1: GAZI UNIVERSITY; 2: Abant Izzet Baysal University)

PROSPECTIVE TEACHERS' KNOWLEDGE ABOUT VECTORS AND ITS APPLICATIONS
TO ALGEBRAIC AND GRAPHICAL PROBLEMS

Sima **Rabbi***, Nasim **Asghary**

(Department of Mathematics)

SIMA RABBI

Seyda **Birni*** (1), Zekeriya **Karada** (2)

(1: Bayburt University; 2: Giresun University)

IS GEOMETRIC LITERACY NECESSARY?

TSG 14 – Teaching and learning of probability

Co-chairs: Carmen **Batanero** (Spain), Egan **Chernoff** (Canada)

Team members: Joachim **Engel** (Germany), Ernesto **Sánchez** (Mexico), Hollylynn **Lee** (USA)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 10

Session Chair: Egan **Chernoff**

Presentations: Vincent **Martin***, Laurent **Theis**

(University of Sherbrooke)

THE TEACHING OF PROBABILITY TO STUDENTS JUDGED OR NOT
WITH DIFFICULTIES IN MATHEMATICS IN ELEMENTARY CLASSES IN QUEBEC

Signe Holm **Knudtzon***

(Buskerud and Vestfold University College)

PITFALLS AND SURPRISES IN THE TEACHING OF PROBABILITY

Raimundo José **Elicer*** (1), Eduardo Andrés **Carrasco** (2)
(1: Universidad Austral de Chile; 2: Universidad Metropolitana de Ciencias de la Educación)
CONDITIONAL PROBABILITY AS A DECISION MAKING TOOL: A DIDACTIC SEQUENCE

Mónica **Giuliano***, Silvia **Pérez**, Martín **García**
(Universidad Nacional de La Matanza)
TEACHING PROBABILITY AND STATISTICS WITH E-STATUS

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: K: purple, Law Building, room 10

Session Chairs: Carmen **Batanero**, Ernesto **Sánchez**
Presentations: M. Pedro **Huerta***
(Universitat de València)
PREPARING TEACHERS FOR TEACHING PROBABILITY THROUGH PROBLEM SOLVING

Katharina **Böcherer-Linder*** (1), Andreas **Eichler** (2), Markus **Vogel** (3)
(1: University of Education Freiburg; 2: University Kassel; 3: University of Education Heidelberg)
THE IMPACT OF VISUALIZATION ON UNDERSTANDING CONDITIONAL PROBABILITIES

Isaias **Miranda-Viramontes*** (1), Beatriz Adriana **Rodríguez-González** (2)
(1: Instituto Politécnico Nacional; 2: Universidad Politécnica de Zacatecas)
UNDERSTANDING PROFESSORS' DECISIONS TO ASSESS STUDENTS' LEARNING OF PROBABILITY

Augusta Rosa **Osorio***
(Pontificia Universidad Católica del Perú)
STRENGTHENING OF ELEMENTARY TEACHERS IN THE USE OF PROBABILITY IN EVERYDAY LIFE EVENTS

Jesús Humberto Cuevas **Acosta** (1), Grevin Ramírez **Arce*** (2)
(1: Technological Institute of Chihuahua II; 2: Technological Institute of Costa Rica)
PERFORMANCE IN STOCHASTIC BETWEEN SECONDARY TEACHERS AND TEACHING STUDENTS: COMPARATIVE STUDY IN COSTA RICA AND MÉXICO

Annarosa **Serpe***, Maria Giovanna **Frassia**
(University of Calabria)
MATHEMATIZATION OF UNCERTAINTY WITH THE AID OF COMPUTERS: A MODEL OF ACTIVITY IN HIGH SCHOOL

Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: K: purple, Law Building, room 10

Session Chair: Joachim **Engel**
Presentations: Jorge **Soto-Andrade**, Daniela **Díaz-Rojas**, Pamela **Reyes-Santander***
(CIAE & Depto. Matemáticas; Pontificia Universidad Católica de Valparaíso)
RANDOM WALKS AS LEARNING SPROUTS IN THE DIDACTICS OF PROBABILITY

Blanca Ruiz **Hernández***
(Tecnologico de Monterrey)
RANDOM VARIABLE AND ITS RELATIONSHIP WITH STATISTICAL VARIABLE: AN EDUCATIONAL PERSPECTIVE FROM A CONCEPT ANALYSIS





Maria **Nascimento*** (1), Eva **Morais** (1), J. Alexandre **Martins** (2)
(1: Universidade de Trás-os-Montes e Alto Douro; 2: Instituto Politécnico da Guarda)
REPRESENTATIONS IN PROBABILITY PROBLEMS

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: K: purple, Law Building, room 10

Session Chair: Hollylynne **Lee**
Presentations: Ana **Serrado-Bayes***
(Colegio La Salle-Buen Consejo)
**ENHANCING REASONING ON RISK MANAGEMENT THROUGH A DECISION-MAKING
PROCESS ON A GAME OF CHANCE TASK**

Santiago **Inzunsa***
(Universidad Autónoma de Sinaloa)
**CONNECTING THEORETICAL PROBABILITY AND EXPERIMENTAL PROBABILITY
IN A MODELING ENVIRONMENT**

Shengqing **He*** (1), Zikun **Gong** (2)
(1: Beijing Normal **University**; 2: Hangzhou Normal **University**)
**CHILDREN'S LEARNING PROGRESSIONS ON PROBABILITY AND SUGGESTIONS
FOR CURRICULUM IMPROVEMENT**

Zikun **Gong*** (1), Shengqing **He** (2)
(1: Hangzhou Normal University; 2: Beijing Normal University)
**STUDY ON DEVELOPMENTAL STAGES AND IMPORTANT PERIODS OF
PROBABILITY COGNITION FOR CHILDREN AGED 6–14**

TSG 15 – Teaching and learning of statistics

Co-chairs: Dani **Ben-Zvi** (Israel), Gail **Burrill** (USA)
Team members: Andreas **Eichler** (Germany), Dave **Pratt** (UK), Lucia **Zapata-Cardona** (Columbia)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: E: mint, Economical Building, room 0079

Session Chair: Dave **Pratt**
Presentations: Eun-Sung **Ko***
(Jeonju National University of Education)
**FRAMEWORK FOR THE TEACHING OF STATISTICAL PROBLEM SOLVING
AT SCHOOL LEVEL**

Xie **Yangchun***
(The Affiliated High School of Gannan Normal University)
**LESSON STUDY: INVESTIGATING CORE CONCEPTS IN CLASSROOMS OF STATISTICS –
A CASE STUDY**

Jase **Moussa-Inaty***, Mark **Causapin**
(Zayed University)
**COGNITIVE LOAD DURING SIMULATION-BASED INSTRUCTION ON BINOMIAL
PROBABILITY DISTRIBUTIONS**

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: E: mint, Economical Building, room 2054/55

Session Chair: Dani **Ben-Zvi**

Presentations: Soledad **Estrella***, Raimundo **Olfos**
(Pontificia Universidad Catolica de Valparaiso)

EARLY STATISTICS: GRAPHICAL REPRESENTATIONS AND TRANSDUPLICATION
IN 3RD GRADE STUDENTS

Sonia **Kafoussi***

(University of the Aegean)

TEACHING STATISTICS IN PRIMARY SCHOOL: COLLECTING AND ORGANIZING DATA

Danijela **Marolt***

(Gimnazija Celje – Center)

PRACTICAL APPLICATION OF STATISTICAL METHODS IN THE GOLDEN
APPLE SCHOOL PROJECT

Ratu Ilma **Putri*** (1), Zulkardi **Zulkardi** (1), Maarten Dolk **Dolk** (2)

(1: Sriwijaya University; 2: Utrecht University)

COMMUNICATING AND REPRESENTING STUDENTS SKILL USING SOCIO
MATHEMATICAL NORMS IN CLASSROOM ABOUT DATA REPRESENTATION: ONE

Luciane Mulazani **dos Santos**, Joana Steil **Alves**, Elisa **Henning***, Ivanete Zuchi **Siple**

(Santa Catarina State University)

STATISTICAL LITERACY OF CHILDREN INVESTIGATED WITH THE SUPPORT
OF INFORMATION AND COMMUNICATION TECHNOLOGIES

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 0079

Session Chair: Gail **Burrill**

Presentations: Hui Teng **Chia***

(Singapore Polytechnic)

SINGAPORE DIPLOMA IN ENGINEERING MATHEMATICS LECTURERS'
INTERPRETATIONS OF STATISTICAL LITERACY: A CASE STUDY

Arjen **De Vetten*** (1,2), Judith **Schoonenboom** (3), Ronald **Keijzer** (2,4), Bert **Van Oers** (1)

(1: Vrije Universiteit Amsterdam; 2: Hogeschool iPabo; 3: Universität Wien; 4: Utrecht University)

EXPLORING STUDENT TEACHERS' REASONING ABOUT INFORMAL STATISTICAL
INFERENCE WHEN ENGAGED IN A GROWING SAMPLES ACTIVITY

Orlando Rafael González **González*** (1,2), Somchai **Chitmun** (3)

(1: Hiroshima University; 2: Assumption University; 3: Srimahosot School)

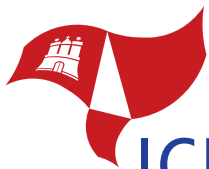
ASSESSING SPORT OUTCOMES AS A WAY TO BUILD STUDENTS'
DATA-DRIVEN DECISION-MAKING SKILLS

Gilda Lisbôa **Guimarães*** (1), Izabella **Oliveira** (2)

(1: University Federal of Pernambuco; 2: University Laval)

CLASSIFYING: COMPREHENSION OF STUDENTS AND TEACHERS OF PRIMARY SCHOOL





Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: E: mint, Economical Building, room 2054/55

Session Chair: Lucia **Zapata-Cardona**

Presentations: Gamze **Kurt***

(Middle East Technical University)

PRESERVICE MATHEMATICS TEACHERS' TPACK DEVELOPMENT IN STATISTICS TEACHING: A LESSON STUDY

Aisling M. **Leavy*** (1), Finbarr **Sloane** (2)

(1: University of Limerick; 2: National Science Foundation)

PROSPECTIVE PRIMARY TEACHERS UNDERSTANDINGS OF GRAPHS

Byungjoo **Tak*** (1), Na-Young **Ku** (1), Hyun-Young **Kang** (2), Kyeong-Hwa **Lee** (1)

(1: Seoul National University; 2: Mokwon University)

KOREAN PRESERVICE TEACHERS' KNOWLEDGES FOR TEACHING STATISTICAL SAMPLE

TSG 16 – Teaching and learning of calculus

Co-chairs: David **Bressoud** (USA), Víctor **Martinez-Luaces** (Uruguay)

Team members: Imène **Ghedamsi** (Tunisia), Günter **Törner** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: E: mint, Economical Building, room 3017

Group A – Session Chair: Günter **Törner**

Presentations: Sergiy **Klymchuk***

(Auckland University of Technology)

USING COUNTEREXAMPLES, PUZZLES AND PROVOCATIONS FOR ENHANCING TEACHING AND LEARNING OF CALCULUS

Angie **Hodge***, Janice **Rech**

(University of Nebraska Omaha)

TERTIARY CALCULUS: WHY AND HOW IT CAN BE USED TO SHAPE HOW FUTURE MATHEMATICS TEACHERS TEACH

Raquel Carneiro **Dörr***, Cristiano Alberto **Muniz**

(University of Brasilia)

THE MATHEMATICAL KNOWLEDGE OF CALCULUS STUDENTS AND POSSIBLE RELATIONS WITH EVASION AND FAILURE

Higinio **Ramos***, Susana **Nieto**

(Universidad de Salamanca)

A NOVEL PROCEDURE FOR OBTAINING INDEFINITE INTEGRALS USING THE CONCEPT OF INVERSE OF A FUNCTION

Location: E: mint, Economical Building, room 3030

Group B – Session Chair: Imène **Ghedamsi**

Presentations: Stefanie **Arend***

(Carl von Ossietzky Universität Oldenburg)

UNDERSTANDING-ORIENTED HANDLING OF THE EPSILON-DELTA-DEFINITION OF CONTINUITY BY STUDENTS OF MATHEMATICS

Aggeliki **Efstathiou***, Joanna **Mamona-Downs**

(University of Patras)

BUILDING UP ALTERNATIVE DEFINITIONS. THE CASE OF THE LIMIT FOR ONE VARIABLE REAL FUNCTION

Karel **Hrbacek** (3), Olivier **Lessmann** (2), Richard **O'Donovan*** (1)

(1: Collège André-Chavanne; 2: Collège Rousseau; 3: CUNY)

CALCULUS USING PROXIMITIES: AN APPROACH IN WHICH STUDENTS CAN ACTUALLY PROVE THEOREMS

Analia **Bergé***

(Université du Québec à Rimouski)

PROVING WHAT SEEMS TO BE EVIDENT

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 3017

Group A – Session Chair: Günter **Törner**

Presentations: Ajit **Kumar***

(ICT Mumbai)

TEACHING CALCULUS USING SAGE

Hans-Jürgen **Elschenbroich***

(Medienberatung NRW (retired))

A VISUAL APPROACH TO BASIC CONCEPTS OF CALCULUS

Eyup **Sevimli***

(Gaziosmanpa a University)

EVALUATING THE EFFECTS OF TECHNOLOGY USE ON THE LEARNING OUTCOMES IN CALCULUS: PERSPECTIVES FROM DEPARTMENTAL DIFFERENCES

Matti **Pauna***

(University of Helsinki)

REDESIGNING CALCULUS CURRICULUM WITH ONLINE COURSES

Igor Yakov **Subbotin*** (1), Nikolai Nikolai **Bilotskii** (2)

(1: National University; 2: Kiev National Pedagogic University)

ALGORITHMS AND ELEMENTARY FUNCTIONS: TWO SIDES OF THE SAME FUNDAMENTAL NOTION

Anna-Katharina **Roos***

(Universität Würzburg)

MISCONCEPTIONS OF MATHEMATICS STUDENTS ABOUT REAL FUNCTIONS





Location: E: mint, Economical Building, room 3030

Group B – Session Chair: Imène **Ghedamsi**

Presentations: Laura Conejo **Garrote***, Matías Arce **Sánchez**, Tomás Ortega **del Rincón**
(University of Valladolid)

THE USE OF PROOF SCHEMES AND PREFORMAL PROOFS IN THE TEACHING
OF THE CONCEPT OF LIMIT: A SUPPORTING MATERIAL

Laure Isabelle **Barthel***

(Hadassah Academic College)

LOCAL PROPERTIES IN CALCULUS: A UNIFYING THEME

Christine Alyssa **Herrera***

(Texas State University)

AN ANALYTICAL FRAMEWORK OF ANALYSIS STUDENTS' CONCEPTUALIZATION OF LIMITS

Rita **Desfitri***

(University of Bung Hatta)

IN-SERVICE TEACHERS' UNDERSTANDING ON LIMIT AND DERIVATIVE AND
THOSE IMPACT TO TEACHING AND LEARNING PROCESS

Behiye **Ubuz***, Utkun **Aydın**

(Middle East Technical University)

MODELS OF MATHEMATICAL THINKING ABOUT THE DERIVATIVE:
A MULTILEVEL ANALYSIS

Marcel **Klinger***

(University of Duisburg-Essen)

ASSESSING STUDENTS' UNDERSTANDING OF THE CONCEPT OF DIFFERENTIATION
AND A FUNCTION'S PARAMETERS

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 3017

Session Chair: David **Bressoud**

Presentations: Miguel **Díaz***

(Universidad Pedagógica Nacional)

CONCEPTS OF CALCULUS. UNDERSTANDING OF HIGH SCHOOL TEACHERS IN MEXICO

Rebecca Anne **Dibbs***

(Texas A&M Commerce)

DIFFERENTIAL PARTICIPATION IN POST-CLASS REFLECTIONS AND CONCEPT ACQUISITION IN
INTRODUCTORY CALCULUS

Monica **Panero*** (1,2)

(1: Institut Français de l'Éducation; 2: Dipartimento di Matematica)

FROM $F'(X_0)$ TO $F'(X)$

Dennis Balanay **Roble***, Christina Valdez **Maglipong**

(Mindanao University of Science and Technology)

FACTORS AFFECTING STUDENTS' CONCEPTUAL UNDERSTANDING OF AREA
OF PLANE REGIONS IN INTEGRAL CALCULUS

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: E: mint, Economical Building, room 3017

Session Chair: David **Bressoud**

Presentations: Paloma **Puerto*** (1), Natividad **Adamuz** (2), Rafael **Bracho** (2), Veronica **Albanese** (3)
(1: IES Averroes; 2: Universidad de Córdoba; 3: Universidad de Granada)

[CALCULATION ALGORITHMS: A LITERATURE REVIEW](#)

Sonia Barbosa Camargo **Igliori**, Marcio Vieira **Almeida***

(Pontifical Catholic University of São Paulo (PUC/SP))

[DEVELOPING MATERIALS FOR DIFFERENTIAL AND INTEGRAL CALCULUS](#)

André **Henning***

(Humboldt-Universität zu Berlin)

[LINEAR APPROXIMATION AND THE DERIVATIVE IN LOWER SECONDARY SCHOOL](#)

Manuel **Estrella**, José Antonio Fernández-Plaza*, Luis **Rico**

(University of Granada)

[CONSISTENCY BETWEEN THE DEFINITION AND COUNTEREXAMPLES ON THE TENDENCY OF A FUNCTION AT A POINT](#)

Mario Adrián **Caballero-Pérez***, Ricardo **Cantoral**

(Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional)

[DEVELOPMENT OF VARIATIONAL THINKING AND LANGUAGE FOR THE TEACHING AND LEARNING OF CALCULUS](#)

TSG 17 – Teaching and learning of discrete mathematics (including logic, game theory and algorithms)

Co-chairs: Eric **Hart** (USA), Cecile O. **Buffet** (France)

Team members: Hans-Wolfgang **Henn** (Germany), Jim **Sandefur** (USA), Ahmed **Semri** (Algeria)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 713

Session Chairs: Eric W. **Hart**, James **Sandefur**

Presentations: James **Sandefur*** (1), Kay **Somers** (2), Rosalie **Dance** (3)

(1: Georgetown University; 2: Moravian College; 3: University of Virgin Islands)

[RECURSION VERSUS CLOSED FORMULAS](#)

Maria Flavia **Mammana***, Daniela **Ferrarello**

(University of Catania)

[GRAPH THEORY IN PRIMARY, MIDDLE AND HIGH SCHOOL](#)

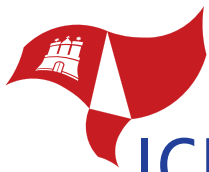
Antonio Kennedy Lopes **Dantas***, Manassés **da Silva Batista**,

Neurivan Humberto Cardoso **de Castro**, Franscismar **Holanda**

(Federal Institute of piauí)

[CLOTHING AND USE OF HANOI TOWER: A LEARNING IN PRACTICE](#)





Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: I: blue, Philosophical Tower, room 713

Session Chairs: James **Sandefur**, Eric **W.Hart**

Presentations: Elise **Lockwood***
(Oregon State University)

GENERALIZATION IN STUDENTS' COMBINATORIAL THINKING

Lisa **Rougetet***

(University of Lille)

MACHINES DESIGNED TO PLAY NIM GAMES AS TEACHING SUPPORT FOR
MATHEMATICS, ALGORITHMICS AND COMPUTER SCIENCE (1940 – 1970)

Vladimir **Igoshin***

(Saratov State University)

MATHEMATICS AND LOGIC: THEIR RELATIONSHIP IN THE TRAINING OF
TEACHERS OF MATHEMATICS

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: I: blue, Philosophical Tower, room 713

Session Chairs: Eric W. **Hart**, James **Sandefur**

Presentations: Catherine **Vistro-Yu***, Flordeliza **Francisco**
(Ateneo de Manila University)

DISCRETE MATHEMATICS IN THE GENERAL EDUCATION CURRICULUM

Ödön **Vancsó*** (1), György **Emese** (2), Eleonora **Stettner** (3), Judit **Szitányi** (1)

(1: Eötvös Loránd Tudományegyetem; 2: Ujpest Bilingual Technical Secondary School;
3: University of Kaposvár)

COMPLEX MATHEMATICS EDUCATION IN THE 21ST CENTURY –
IMPROVING COMBINATORIAL THINKING BASED ON T. VARGA'S HERITAGE

Aaron Gao*, Benedetto **Di Paola**

(University of Palermo)

I LIKE DISCRETE MATHEMATICS, BUT I DO NOT KNOW HOW TO TEACH IT

TSG 18 – Reasoning and proof in mathematics education

Co-chairs: Guershon **Harel** (USA), Andreas **Stylianides** (UK)

Team members: Paolo **Boero** (Italy), Mikio **Miyazaki** (Japan), David **Reid** (Germany/Canada)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: I: blue, Philosophical Tower, room 756

Group A – Session Chair: Guershon **Harel**

Presentations: Dan **Jazby***
(University of Melbourne)

TEACHER DISCURSIVE PRACTICES WHICH SUPPORT PRIMARY STUDENTS'
DEVELOPMENT OF DEDUCTIVE REASONING

Esther **Brunner*** (1), Kurt **Reusser** (2), Christine **Pauli** (3)
(1: Thurgau University of Teacher Education; 2: Institute of Education; 3: Institute of Education)
DO TEACHERS TAKE FULL ADVANTAGE OF THE POTENTIAL PROVIDED BY DIFFERENT TYPES OF MATHEMATICAL PROOF?

Horacio C. **Solar*** (1), Jordi **Deulofeu** (2)
(1: Pontificia Universidad Católica de Chile; 2: Universidad Autónoma de Barcelona)
CONTINGENCY IN MATHEMATICS LESSONS THROUGH ARGUMENTATIVE ORCHESTRATION

Zahra **Rahimi*** (1), Ebrahim **Talae** (2), Ebrahim **Reihani** (3), Hashem **Fardanesh** (4)
(1: Tarbiat Modares University; 2: Tarbiat Modares University; 3: Shahid Rajaei University; 4: Tarbiat Modares University)
DESIGNING AN INSTRUCTIONAL MODEL FOR REALIZATION OF MATHEMATICAL THINKING IN SECONDARY SCHOOL STUDENTS

Location: I: blue, Philosophical Tower, room 1009

Group B – Session Chair: Mikio **Miyazaki**
Presentations: Abdellah **El Idrissi*** (1), Omar **Rouan** (2)
(1: CFIE; 2: ENS)
AREA AS A TOOL IN MATHEMATICAL PROOFS SOME HISTORICAL CASES

Stacy **Brown***
(California State Polytechnic University)
TO BE OR NOT TO BE: STUDENTS' REASONING ABOUT THE CONSTRUCTIVE DILEMMA

Guangxiang **Zhang***
(Southwest University)
FROM ORIGINAL INDUCTION TO NUMERICAL REASONING

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: I: blue, Philosophical Tower, room 756

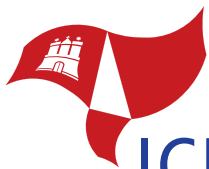
Group A – Session Chair: Andreas **Stylianides**
Presentations: Chao **Zhou***
(Soochow university)
A SURVEY OF 94 ELEMENTARY MATHEMATICS TEACHERS ABOUT MAY MATHEMATICAL REASONING BE TAUGHT AT ELEMENTARY SCHOOL PERIOD

Koji **Iwata*** (1), Mikio **Miyazaki** (2), Tomohiko **Makino** (3), Taro **Fujita** (4)
(1: Fukuoka University of Education; 2: Shinshu University; 3: Utsunomiya University; 4: University of Exeter)
LEARNING OF APPLICATION OF FUNCTIONS THROUGH CONSTRUCTING PROOFS

Joana **Mata-Pereira***, João Pedro **Ponte**
(Instituto de Educação)
ENHANCING STUDENTS' MATHEMATICAL REASONING IN WHOLE CLASS DISCUSSIONS

Muhammed Fatih **Dogan***
(University of Wisconsin-Madison)
NATURE OF TEACHERS' ENGAGEMENTS IN PROVING ACTIVITIES





Nadia **Douek***

(Université de Nice)

PROMOTING EXPLORATION IN THE PERSPECTIVE OF TEACHING AND
LEARNING PROVING PRACTICES IN MATHEMATICS

Location: I: blue, Philosophical Tower, room 1009

Group B – Session Chair: Mikio **Miyazaki**

Presentations: Fernanda Aparecida **Ferreira*** (1), Cintia A. Bento **Santos** (2)
(1: CEFET/MG; 2: UNICSUL/SP)

MATHEMATICAL PROOFS: INTERPRETATIVE ANALYSIS OF RESEARCHES
PRESENTED AT ICME BETWEEN 2003 AND 2013

Jenny Christine **Cramer***

(University of Bremen)

ANALYZING OBSTACLES FOR MATHEMATICAL ARGUMENTATION

Isil **Isler***

(Isil Isler)

WHAT ARE ELEMENTARY TEACHERS' EXPECTATIONS REGARDING
REASONING AND PROOF IN SCHOOL MATHEMATICS?

Eva **Müller-Hill***

(Universität zu Köln)

ASPECTS OF OPERATIONAL MATHEMATICAL EXPLANATION

Tuyin **An***

(Purdue University)

PRESERVICE SECONDARY MATHEMATICS TEACHERS' CONCEPTION OF
APPLICATION OF THEOREMS IN GEOMETRY

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 756

Group A – Session Chair: David **Reid**

Presentations: Cynthia L. **Stenger***, James A. **Jerkins**, Janet T. **Jenkins**, Jessica E. **Stovall**
(University of North Alabama)

USING COMPUTER PROGRAMMING TO TEACH GENERALIZATION

Erna **Lampen***

(RUMEUS)

PROBLEMATISING THE CIRCLE: MATHEMATICS EDUCATION STUDENTS'
CONSTRUCTION REASONING

Markus **Hohenwarter** (1), Zoltán **Kovács*** (2), Tomás **Recio** (3)

(1: Johannes Kepler University; 2: The Private University College of Education of the Diocese of Linz;
3: University of Cantabria)

DECIDING GEOMETRIC PROPERTIES SYMBOLICALLY IN GEOGEBRA

Fatemeh Ahmadpour **Mobarakeh***, Mohamad Reza **Fadaee**

(Shahid Bahonar University of Kerman)

THE STATUS OF REASONING AND PROOF IN IRANAIN SEVENTH-GRADE
MATHEMATICS TEXTBOOK

Oral Communications

OC

Location: I: blue, Philosophical Tower, room 1009

Group B – Session Chair: Paolo **Boero**

Presentations: Barry J. **Griffiths***

(University of Central Florida)

A COMPARISON OF SYLLOGISTIC REASONING SKILLS AMONG AMERIC. UNDERGRADUATES

Marta T. **Magiera***, Vecihi S. **Zambak**

(Marquette University)

ANALYSIS OF ARGUMENTS FORMULATED BY GRADES 1–8 PROSPECTIVE TEACHERS IN “CONSTRUCTING” AND “CRITIQUING” PROBLEM SITUATION

Hyejin **Park***

(University of Georgia)

ONE COLLEGE STUDENT’S PERCEPTIONS OF PROOF METHODS AND CHARACTERISTICS OF CHOOSING PROOF METHODS IN CONSTRUCTING PROOFS

Wang **ZhiLing***

(East China Normal University)

CASES STUDY ON EIGHT GRADE STUDENTS’ PSYCHOLOGICAL MODEL OF GEOMETRIC REASONING AND PROOF – IN CASE OF CONGRUENT TRIANGL

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: I: blue, Philosophical Tower, room 756

Group A – Session Chair: David **Reid**

Presentations: Johnny Alfredo Vanegas **Diaz***

(Universidad Autónoma de Guerrero)

RECONSTRUCTION OF AN ABDUCTIVE STRUCTURE: THE CASE OF EQUAL AREAS IN GEOMETRY

Naomi Prusak*, Osama **Swidan**, Baruch **Schwarz**

(Hebrew University of Jerusalem)

FROM PEER ARGUMENTATION TO DEDUCTIVE REASONING AND PROOFS

Nadia **Azrou***

(University Yahia Fares)

PROOF TEXT WRITING AT THE UNDERGRADUATE LEVEL: NEW FINDINGS FROM STUDENTS’ INTERVIEWS

Sonia **Abrantes Garcez Palha*** (1,2), Jeroen **Spandaw** (3)

(1: University of Amsterdam; 2: University of Applied Sciences of Amsterdam;

3: Delf University of Technology)

HOW COLLABORATIVE REASONING CONTRIBUTES TO STUDENT’S UNDERSTANDING OF INTEGRALS?

Location: I: blue, Philosophical Tower, room 1009

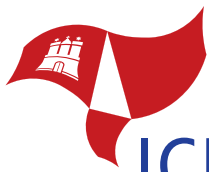
Group B – Session Chair: Paolo **Boero**

Presentations: Christian Fahse*

(University of Koblenz-Landau)

DIFFERENT TYPES OF ARGUMENTATION IN A QUASI-LONGITUDINAL STUDY IN A SECONDARY SCHOOL





Helena **Johansson***

(University of Gothenburg)

REAL-LIFE CONTEXT AND MATHEMATICAL REASONING –
INFLUENCES ON STUDENTS' SUCCESS ON MATHEMATICS TASKS

Zwelithini Bongani **Dhlamini***, Kabelo **Chuene**

(University Of Limpopo)

MATHEMATICAL REASONING STRATEGIES THAT ARE CHALLENGING FOR
LEARNERS IN THE ANA IN SOUTH AFRICA

Margo F. **Kondratieva***

(Memorial University)

WHAT CAN BE LEARNER BY TEACHERS THROUGH THE PROCESS OF
COLLECTIVE PRODUCTION OF MULTIPLE PROOFS?

TSG 19 – Problem solving in mathematics education

Co-chairs: Peter **Liljedahl** (Canada), Manuel Santos **Trigo** (Mexico)

Team members: Uldarico **Malaspina** (Peru), Guido **Pinkernell** (Germany), Laurent **Vivier** (France)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 4018

Group A – Session Chair: Peter **Liljedahl**

Presentations: Jong Cherng **Meei***, Chiew Chin **Mon**

(Teacher Education Institute Tuanku Bainun Campus)

PROBLEM SOLVING BELIEFS OF PRE-SERVICE MATHEMATICS TEACHERS:
A MALAYSIAN PERSPECTIVE

Behnaz **Savizi***

(educational ministry)

7TH GRADE TEACHERS' BELIEFS ABOUT PROBLEM SOLVING HEURISTICS
IN IRANIAN MATHEMATICS TEXTBOOKS

Patricio **Felmer***, Josefa **Perdomo-Díaz**, Cristián **Reyes**

(University of Chile)

PROBLEM SOLVING FOR TEACHERS' PROFESSIONAL DEVELOPMENT

Location: E: mint, Economical Building, room 4020

Group B – Session Chair: Manuel **Santos**

Presentations: Yip Cheung **Chan***

(The Chinese University of Hong Kong)

EXPERIMENTATION AND REASONING INTERPLAY IN THE PROCESS OF
PROBLEM SOLVING WITH THE USE OF DYNAMIC GEOMETRY SOFTWARE

Qing **Li***, Shu Wen **Li**

(Northeast Normal University)

RESEARCH ON THE RELATIONSHIPS AMONG KNOWLEDGE, STRATEGY AND
META-COGNITION IN MATHEMATICAL PROBLEM SOLVING

Mei Yoke **Loh*** (1), Ngan Hoe **Lee** (2)

(1: Ministry of Education; 2: National Technology University)

RECONCILING DIFFERENCES IN FINDINGS FROM MULTIPLE DATA SOURCES
IN THE INVESTIGATION OF METACOGNITION IN PROBLEM SOLVING

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 4018

Group A – Session Chair: Manuel **Santos**

Presentations: Sheila **Evans***

(University of Nottingham)

ORCHESTRATING PRODUCTIVE WHOLE CLASS DISCUSSIONS:
THE ROLE OF DESIGNED STUDENT RESPONSES

Jennifer Lynne **Wise***

(Hand Middle School/University of South Carolina)

STUDENT LEARNING COMMUNITIES: STRENGTHENING STUDENT
PROBLEM SOLVING SKILLS

Hoyun **Cho*** (1), Gary **Lawrence** (2)

(1: Capital University; 2: Mustard Seed School)

DEVELOPING A POSITIVE SCHOOL CULTURE WITH TEACHING MATHEMATICS
THROUGH PROBLEM SOLVING

Ana María **Vozzi***

(Universidad Nacional de Rosario- Facultad de Cs. Exactas Ingeniería y Agrimensura)

PROBLEM SOLVING AND THE MATHEMATICAL LANGUAGE

Location: E: mint, Economical Building, room 4020

Group B – Session Chair: Guido **Pinkernell**

Presentations: Shuk-kwan **Leung*** (1), Ha-kping **Tam** (2)

(1: National Sun Yat-sen University; 2: National Taiwan Normal University)

A TEACHER EDUCATOR'S USE OF OWN TEACHING IN MATH PROBLEM POSING
FOR TEACHERS (PARENTS) WORKSHOPS

Christine **Choquet*** (1), Magali **Hersant** (1), Laetitia **Bueno-Ravel** (2)

(1: University of Nantes; 2: University of Brest)

IS INQUIRY-BASED APPROACH POSSIBLE AT THE ELEMENTARY SCHOOL?
A CASE STUDY

Aihui **Peng*** (1), Jing **Li** (2), Yanjie **Li** (3), Yueqiang **Shang** (1)

(1: Southwest University; 2: Lanfang Teacher College; 3: New Century School)

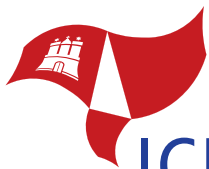
A VARIATION PERSPECTIVE ON TEACHING PROBLEM SOLVING IN CHINA

Lorena **Salazar-Solórzano***

(Universidad de Costa Rica)

DEVELOPING THE COMPETENCE OF CREATING PROBLEMS IN FUTURE
TEACHERS OF MATHEMATICS





Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: E: mint, Economical Building, room 4018

Group A – Session Chair: Peter **Liljedahl**

Presentations: José Antonio Fernández **Bravo*** (1), Juan Jesús Barbarán **Sánchez** (2), Ana Belén Montoro **Medina** (1)

(1: University Camilo José Cela; 2: University of Granada)

INVENT PROBLEMS: A WAY TO DEVELOP MATHEMATICAL COMPETENCE

Th. **Gawlick***, Elisabeth **Lucyga**

(Leibniz Universität)

TYPES OF PLANS AS DEVELOPMENT STAGES OF PROBLEM SOLVING

Juan Jesús **Barbarán Sánchez*** (1), José Antonio **Fernández Bravo** (2),

Ana Belén **Montoro Medina** (2)

(1: University of Granada; 2: University Camilo José Cela)

INFLUENCE OF INVENTION OF MATHEMATICAL PROBLEMS IN METACOGNITION

Location: E: mint, Economical Building, room 4020

Group B – Session Chair: Manuel **Santos**

Presentations: Rosana Nogueira **de Lima***, Maria Elisa Esteves Lopes **Galvão**

(Universidade Anhanguera de São Paulo)

HOW TO DEVELOP RELATIONAL CALCULUS: A PROBLEM SOLVING APPROACH

Mustafa Serkan **Pelen*** (1), Perihan Dinç **Artut** (2)

(1: MEB; 2: Çukurova University)

AN INVESTIGATION OF MIDDLE SCHOOL STUDENTS' ACHIEVEMENTS ON MISSING VALUE PROBLEMS

Mimi **Park*** (1), Kyeong-Hwa **Lee** (2)

(1: Gyeongin National University of Education; 2: Seoul National University)

TEACHING RELATIONAL STRUCTURE VIA MATHEMATICAL PROBLEM ANALOGY

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 4018

Group A – Session Chair: Manuel **Santos**

Presentations: Raja **Herold-Blasius***, Benjamin **Rott**

(University of Duisburg-Essen)

STRATEGY KEYS AS KEY TO USE HEURISTICS – A QUALITATIVE STUDY WITH 3RD AND 4TH GRADERS

Anna-Christin **Söhling***

(University of Münster)

THE ROLE OF ABDUCTION IN PROBLEM SOLVING

Soraia **Prates***

(PUCPR)

TEACHING STRATEGIES FOR MATHEMATICAL PROBLEM SOLVING IN SCHOOL: STUDY GROUP WITH TEACHERS

Katherine Elizabeth **Miller**, David **Bowers**, Azin **Sanjari***, Azita **Manouchehri**
(The Ohio State University)
PROBLEM SOLVING STRATEGIES OF PRE-SERVICE TEACHERS:
A GRADEBAND COMPARISON

Location: E: mint, Economical Building, room 4020

Group B – Session Chair: Guido **Pinkernell**

Presentations: Ana **Kuzle***
(University of Potsdam)

DESIGN-BASED RESEARCH AS A FOUNDATION FOR SYSTEMATICAL AND MATERIAL
BASED DEVELOPMENT OF PROBLEM SOLVING COMPETENCES

Claudia **Vargas***

(Universidad de Santiago de Chile)

CRITICAL THINKING AND PROBLEM SOLVING

Eng Guan **Tay**, Tin Lam **Toh**, Foo Him **Ho***, Pee Choon **Toh**, Yew Hoong **Leong**, Khiok Seng **Quek**,
Jaguthsing **Dindyal**, Kim Hoo **Hang**

(National Institute of Education)

INFUSING MATHEMATICAL PROBLEM SOLVING INTO THE MATHEMATICS CURRICULUM:
FEEDBACK FROM TEACHERS

Majid **Haghverdi***

(Mathematics Department)

A STUDY OF THE EFFECT OF USING “MATHEMATICAN’S CHAIR AND SCHEMA”
STRATEGY IN SOLVING WORD PROBLEMS IN MULTI-GRADES CLASS

TSG 21 – Mathematical applications and modelling in the teaching and learning of mathematics

Co-chairs: Jussara **Araújo** (Brazil), Gloria **Stillman** (Australia)

Team members: Morten **Blomhøj** (Denmark), Dominik **Leiss** (Germany), Toshikazu **Ikeda** (Japan)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 5+6

Group A – Session Chair: Morten **Blomhøj**

Presentations: Maike **Hagena***

(Leuphana Universität Lüneburg)

THE INFLUENCE OF MATHEMATICS PRE-SERVICE TEACHERS’ MEASUREMENT
SENSE ON WORKING ON COMPLEX MODELLING TASKS

Katrin **Vorhölter***, Lisa **Rabe**

(University of Hamburg)

CENTRAL TEACHER COMPETENCIES FOR SUPERVISING STUDENTS DURING
MODELLING DAYS

Abolfazl **Rafiepour***

(Shahid Bahonar University of Kerman)

THE ROLE OF MODELLING AND APPLICATION IN MATHEMATICS TEACHER
EDUCATION PROGRAM IN IRAN





Raisa **Guberman***, Marita **Barabash**, Dafna **Mandler**
(Achva Academic College)

ELEMENTARY SCHOOL MATH TEACHERS LEARN TO TEACH MODELS:
DARING TO LET GO OR GUIDING?

Location: K: purple, Law Building, room 15+16

Group B – Session Chair: Jussara **Araújo**

Presentations: JinHyeong **Park*** (1), Kyeong-Hwa **Lee** (2)
(1: Myongji University; 2: Seoul National University)

GENERALIZATION OF A MATHEMATICAL MODEL BY ABDUCTION:
THE CASE OF THE CHAIN RULE

Diana M. **Fisher***

(Portland State University)

SYSTEM DYNAMICS MODELING CAN REORGANIZE ALGEBRAIC THINKING

Marita **Barabash***, Raisa **Guberman**

(Achva Academic College)

DIDACTIC MODELS LEAD TO BIG IDEAS: AN EXAMPLE OF FRACTIONS

Mai **Hirabayashi***

(University of Tsukuba)

ANALYSIS OF CHILDREN'S INTERPRETATION OF THE RESULTS IN MATHEMATICAL
MODELING: THE CASE OF DIVISIONS WITH REMAINDER

Location: K: purple, Law Building, room 17

Group C – Session Chair: Gloria Ann **Stillman**

Presentations: Talya **Gilat***, Miriam **Amit**
(Ben-Gurion University of the Negev)

AUTHENTIC ASSESSMENT OF STUDENTS' CREATIVE THINKING THROUGH MODEL
ELICITING ACTIVITIES

Martin **Bracke*** (1), Detlev **Friedewold** (2), Jörn **Schnieder** (3)

(1: University of Kaiserslautern; 2: Curriculum Institute Hamburg; 3: University of Lübeck)

TUTORING EXPLORATORY LEARNING AND PROBLEM SOLVING IN MATHEMATICAL
MODELLING – A TRAINING CONCEPT

Deike Susan **Alfke***

(University of Hamburg)

MATHEMATICAL MODELLING WITH INCREMENTAL LEARNING AIDS – A VIDEO STUDY

Samira **Mehraein***

(Ministry of Education)

SECONDARY SCHOOL STUDENTS' ATTITUDE AND MATHEMATICAL
MODELLING ACTIVITIES

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: K: purple, Law Building, room 5+6

Group A – Session Chair: Morten **Blomhoj**

Presentations: Masafumi **Kaneko*** (1), Akihiko **Saeki** (1), Daisuke **Saito** (2)
(1: Naruto University of Education; 2: Joto Junior High School)

THE ANALYSIS OF STUDENTS' NOTION INVENTED BY PRESCRIPTIVE MODELLING
IN PRE-SERVICE TEACHER EDUCATION

Carolina **Guerrero-Ortiz***, Jaime **Mena-Lorca**

(Pontificia Universidad Católica de Valparaíso)
MODELLING IN TEACHER TRAINING

Mary Alice **Carlson***, Elizabeth A. **Burroughs**, Elizabeth **Fulton**, Megan **Wickstrom**
(Montana State University)

TEACHERS' USES OF THE TERM "MODEL" IN CLASSROOM SETTINGS

Issic Kui Chiu **Leung*** (1), Regina M. F. **Wong** (2)

(1: The Hong Kong Institute of Education; 2: Logos Academy)

PRE SERVICE TEACHERS' KNOWLEDGE IN APPLYING STORY METAPHOR IN
TEACHING MODELING: AN EXAMPLE OF WEIGHTING AN ELEPHANT

Rogério Marques **Ribeiro** (1,2), Arthur Belford **Powell*** (2), Ademir Donizeti **Caldeira** (1)

(1: Universidade Federal de São Carlos; 2: Rutgers University – Newark)

MATHEMATICAL MODELING AND POSSIBLE ARTICULATION WITH MATHEMATICAL
KNOWLEDGE FOR TEACHING

Location: K: purple, Law Building, room 15+16

Group B – Session Chair: Jussara **Araújo**

Presentations: Anna **Alfieri***

(Liceo Scientifico "L. Siciliani" High School)

AN APPROACH TO MATHEMATICAL MODELS THROUGH DIGITAL STORYTELLING –
AN EXAMPLE

Maria Giovanna **Frassia***, Annarosa **Serpe**

(University of Calabria)

MATHEMATICAL MODELING AND GEOMETRY TEACHING IN A COMPUTER-BASED
ENVIRONMENT: A CONCRETE EXAMPLE IN SECONDARY SCHOOL

Jonaki **Ghosh***

(Lady Shri Ram College for Women)

LEARNING MATHEMATICS THROUGH TECHNOLOGY ENABLED EXPLORATIONS

Jaqueline Maria **da Silva*** (1), Ana Carolina **Carius** (2), Marcela Martins **Pereira** (1),

Deborah Faragó **Jardim** (1)

(1: UFVJM; 2: IFRJ)

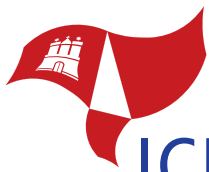
TEACHING DERIVATIVES CONCEPTS WITH COMPUTATIONAL TECHNIQUES

Christian **Spreitzer***

(Pädagogische Hochschule Niederösterreich)

MODELING A REAL PENDULUM WITH SMARTPHONE SENSOR TECHNOLOGY





Location: K: purple, Law Building, room 17

Group C – Session Chair: Gloria Ann **Stillman**

Presentations: Funda **Aydin-Guc*** (1), Adnan **Baki** (2)

(1: Giresun University; 2: Karadeniz Technical University)

INTERPRETATION OF THE ROLE OF MATHEMATICAL MODELLING COMPETENCIES
IN MODELLING PROCESS

Leon **Poladian***

(University of Sydney)

USING JOURNAL ARTICLES IN TERTIARY MATHEMATICS UNITS ON MODELLING
AND APPLICATIONS TO PROMOTE PRODUCTIVE DISPOSITIONS

Matti **Heilio***

(Lappeentanta University of Technology)

ENCOURAGING STUDENTS' CREATIVITY IN MODELLING COURSE EXERCISES

Ruth **Rodriguez*** (1), Diane M. **Fisher** (2)

(1: Tecnologico de Monterrey; 2: Portland State University)

THE VALUE OF SYSTEM DYNAMICS MODELING FOR TEACHING MATHEMATICS

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 5+6

Group A – Session Chair: Toshikazu **Ikeda**

Presentations: Lisa **Steffensen***, Ragnhild **Hansen**, Kjellrun Hiis **Hauge**

(Bergen Universetey College (Høgskolen i Bergen))

CLIMATE CHANGE IN MATHEMATICS CLASSROOMS

Noboru **Yoshimura*** (1), Akira **Yanagimoto** (2)

(1: Tennoji J.H.S. attached Osaka-kyoiku university; 2: Kyoto Univercity of Education)

OPEN-ENDED WORD PROBLEMS TOWARD MATHEMATICAL MODELLING IN JAPAN

Ginger **Watson***, Mary **Enderson**

(Old Dominion Universtiy)

PRE-SERVICE STEM TEACHERS' UNDERSTAINING, PRIOR EXPERIENCES,
AND PREDICTED USE OF MODELING AND SIMULATION

Celil **Ekici*** (1), Cigdem **Alagoz** (2)

(1: University of the Virgin Islands; 2: University of the Virgin Islands)

COLLABORATIVE ACTION RESEARCH WITH STEM TEACHERS ON MATHEMATICAL
MODELING OF WATER QUALITY

Location: K: purple, Law Building, room 15+16

Group B – Session Chair: Dominik **Leiss**

Presentations: María de las Mercedes Aravena **Díaz***, Omar Godoy **Arriagada**, Ximena Colipán **Uribe**

(University Catholic of Maule)

GEOMETRIC MODELING BY STUDENTS FROM VULNERABLE SCHOOLS IN CHILE

Francisco Javier **Camelo***

(Universidad Distrital Francisco José de Caldas)

POLITICAL SUBJETIVITY FROM MATHEMATICAL MODELLING

Irene **Grafenhofer***, Vanessa **Klößner**
(University of Koblenz)

MODELLING TASKS AS AN OPPORTUNITY FOR CONSTRUCTIVE DEALING WITH
HETEROGENEITY

Kwan Eu **Leong***, Jun You **Tan**
(University of Malaya)

MATHEMATICAL MODELLING SKILLS OF SECONDARY STUDENTS

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: K: purple, Law Building, room 5+6

Group A – Session Chair: Toshikazu **Ikeda**

Presentations: Sibawu Witness **Siyepu***
(Cape Peninsula University of Technology)

MATHEMATISING SOUTH AFRICAN TRAFFIC ROAD SIGNS

Kosuke **Mineno***

(Setagaya Junior High School affiliated with Tokyo Gakugei University)

THE ROLES OF GENERATING AND CHOOSING VARIABLES IN DATA-ORIENTED
MODELLING: THE CASE OF CHERRY BLOSSOM

Elizabeth **Sebastian***, Santiago **Therisal**
(Auxilium College)

STABILITY ANALYSIS IN THE EDUCATIONAL SYSTEM USING DIFFERENCE EQUATIONS

Ayşe Tekin **Dede***, Esra Bukova **Guzel**
(Dokuz Eylül University)

HOW TO INTEGRATE MATHEMATICAL MODELLING INTO MATHEMATICS COURSES:
A GUIDE SUGGESTION

Location: K: purple, Law Building, room 15+16

Group B – Session Chair: Dominik **Leiss**

Presentations: Takehiro **Kihira*** (1), Toshihiko **Chikusa** (2), Tetsushi **Kawasaki** (3)
(1: Kyoto Municipal Murasakino High School; 2: Kyoto Prefectural Junior High School
affiliated With Rakuoku Senior High School; 3: Gifu University)

DEVELOPMENT OF TEACHING MATERIALS FOR FOSTERING COGNITIVE ABILITY
OF SPACE IN JAPANESE HIGH SCHOOLS

Makbule Gozde **Didis*** (1), Sinem Bas **Ader** (2), Erdinc **Cakiroglu** (3), Ayhan Kursat **Erbas** (3),
Bulent **Cetinkaya** (3), Cengiz **Alacaci** (4)

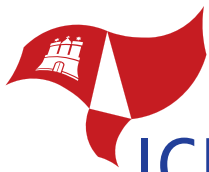
(1: Gaziosmanpasa University; 2: Istanbul Aydin University; 3: Middle East Technical University;
4: Istanbul Medeniyet University)

RESEARCHERS' EXPERIENCE OF DEVELOPING MATHEMATICAL MODELING TASKS
FOR SECONDARY LEVELS

Marco Aurélio **Kistemann Jr.*** (1), Neil da Rocha **Canedo Jr.** (2)
(1: UFJF; 2: PJJ)

INTRODUCING MATHEMATICS MODELLING IN A BASIC EDUCATION
SIXTH GRADE CLASS





Djordje M. **Kadijevich***
(Institute for Educational Research)
DATA MODELING IN K-12-16 EDUCATION

TSG 22 – Interdisciplinary mathematics education

Co-chairs: Susie **Groves** (Australia), Julian **Williams** (UK)
Team members: Rita **Borromeo-Ferri** (Germany), Brian **Doig** (Australia),
Nicholas **Mousoulides** (Cyprus)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: E: mint, Economical Building, room 3027

Session Chair: Brian **Doig**
Presentations: Atara **Shriki*** (1), Ilana **Lavy** (2)
(1: Oranim Academic College of Education; 2: The Max Stern Yezreel Valley College)
MATHEMATICS AND SCIENCES TEACHERS COLLABORATIVELY DESIGN
INTERDISCIPLINARY LESSON PLANS: BENEFITS, LIMITATIONS, CONCERNS

Mutfried **Hartmann*** (1), Thomas **Borys** (1), Arno **Bayer** (2), Tetsushi **Kawasaki** (3)
(1: PH-Karlsruhe; 2: Universidade de Luterana do Brasil; 3: Gifu University)
TEACHING AND APPLYING RESEARCH METHODS IN A CROSS-CULTURAL PROJECT
FOR STUDENTS OF MATHEMATICS EDUCATION

Sikunder Ali **Baber***
(University College Buskerud and Vestfold Norway)
DOING INTERDISCIPLINARY WORK IN MATHEMATICS EDUCATION:
POTENTIALITIES AND CHALLENGES

Maite **Gorritz***, Santi **Vilches**
(INS Arquitecte Manuel Raspall)
INTERDISCIPLINARY ACTIVITIES IN CONTEXT

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: E: mint, Economical Building, room 3027

Session Chair: Rita **Borromeo-Ferri**
Presentations: Nenad **Radakovic*** (1), Limin **Jao** (2), Susan **Jagger** (3)
(1: College of Charleston; 2: McGill University; 3: Ryerson University)
INVESTIGATING INTERDISCIPLINARY APPROACHES AND COMMITMENTS THROUGH
PRE-SERVICE TEACHERS' USE OF MATHEMATICS AND POETRY

Gloria Angélica Moreno **Durazo***, Ricardo **Cantoral**
(Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional)
MATHEMATICS AND MEDICINE: A STUDY OF THINKING AND VARIATIONAL LANGUAGE

Frederick Lim **Uy***
(CSULA)
INCORPORATING MATHEMATICS, CREATIVE WRITING, LITERATURE AND ARTS
IN THE CLASSROOM

Betul **Yeniterzi***, Cigdem **Haser**, Mine **Isiksal-Bostan**
(Middle East Technical University)

TEACHERS' READINESS TO MATHEMATICS AND SCIENCE INTEGRATION

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 3027

Session Chair: Susie **Groves**

Presentations: Roberto **Araya***

(Universidad de Chile)

A CLOUD BASED PERFORMANCE SUPPORT SYSTEM FOR TEACHING STEM
WITH HANDS-ON MODELING

Jong-Eun **Moon***, Mi-Yeong **Park**, Jeong **Soo-Yong**, Mi-Kyung **Ju**
(Hanyang University)

KOREAN MATHEMATICS TEXTBOOK ANALYSIS: FOCUSING ON COMPETENCE,
ON CONTEXTS AND WAYS OF INTEGRATION

Francesco **Scerbo***, Elena **Scordo**, Laura **Vero**

(Liceo Scientifico "L.Siciliani" – Catanzaro – 88100)

MATHEMATICS OF MONEY DYNAMICS

Signe E. **Kastberg*** (1), Rachel **Long** (2), Kathleen **Lynch-Davis** (3), Beatriz S. **D'Ambrosio** (4)

(1: Purdue university; 2: Central elementary school; 3: Appalachian state university; 4: Miami university)

TRANSCENDING THE MATHEMATICS CLASSROOM

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 3027

Session Chair: Nicholas **Mousoulides**

Presentations: Carlos Alfonso **Lopez Leiva***, Marios **Pattichis**, Sylvia **Celedon-Pattichis**

(University of New Mexico)

INTEGRATING MATHEMATICS, ENGINEERING AND TECHNOLOGY THROUGH
MATHEMATICS MODELING AND VIDEO REPRESENTATIONS

OhNam **Kwon** (1), JungSook **Park** (2), JeeHyun **Park** (3), Jaehee **Park** (4), Changsuk **Lee*** (5)

(1: seoul national university; 2: Yang-jae High School; 3: Ban-po High School;

4: Gyeong-gi Science High School for the Gifted; 5: Jang-gok High School)

AN EXPERIMENTAL TEXTBOOK SYSTEM FOR FINANCIAL MATHEMATICS FOR
THE INTEGRATION OF FINANCE AND MATHEMATICS

Maria Rita **Otero*** (1,2), Vivianna Carolina **Llanos** (1,2), Maria Paz **Gazzola** (1,2), Marcelo **Arlego** (1,2)

(1: Universidad Nacional del Centro de la Provincia de Buenos Aires;

2: Consejo Nacional de Investigaciones Cientificas yTecnologicas)

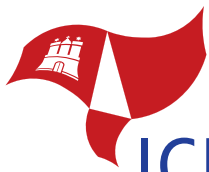
CO-DISCIPLINARY MATHEMATICS AND PHYSICS RESEARCH AND STUDY
COURSE (RSC) IN THE SECONDARY SCHOOL AND THE UNIVERSITY

Diarmaid Aidan **Hyland***, Paul **van Kampen**, Brien **Nolan**

(Dublin City University)

INVESTIGATING STUDENTS' DIFFICULTIES WITH DIFFERENTIAL
EQUATIONS IN PHYSICS.





TSG 23 – Mathematical literacy

Co-chairs: Iddo **Gal** (Israel), Hamsa **Venkat** (SA)

Team members: Vince **Geiger** (Australia), Eva **Jablonka** (UK), Markus **Helmerich** (Germany)

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: H: orange, Educational Building, room 207

Group A – Session Chairs: Vince **Geiger**, Markus Alexander **Helmerich**

Presentations: Terence **Dawson***, Stella **Dudzic**, Stephen **Lee**
(MEI)

DEVELOPING NEW QUANTITATIVE REASONING AND QUANTITATIVE PROBLEM SOLVING QUALIFICATIONS WITH POST 16 STUDENTS

Brenda Reche **Graff*** (1), Ronaldo Barros **Ripardo** (2)

(1: UNIFESSPA; 2: UNIFESSPA)

THEORIES ABOUT MATHEMATICAL LITERACY: A THEORETICAL STUDY

Mustafa Çağrı **Gürbüz***, Murat **Altun**

(Uluda University)

DEVELOPMENT AND EVALUATION OF MATHEMATICAL LITERACY COURSE FOR PRE SERVICE TEACHERS

Location: H: orange, Educational Building, room 208

Group B – Session Chair: Eva **Jablonka**

Presentations: Maryam **Mohsenpour** (1), Zahra **Gooya*** (2)

(1: Alzahra University; 2: Shahid Beheshti University)

ASSESSING IRANIAN STUDENTS' MATHEMATICS LITERACY COMPETENCIES BASED ON PISA STUDIES

Tatag Yuli Eko **Siswono***

(The State University of Surabaya)

HOW MATHEMATICALLY LITERATE ARE SECONDARY TEACHERS IN PERFORMING CONTEXT-BASED PROBLEM SOLVING TASK?: A CASE OF INDONESIA

Luxizi **Zhang***

(East China Normal University)

SHANGHAI SIXTH GRADE STUDENTS' PERFORMANCE ON NUMBER SENSE – A CASE STUDY

TSG 24 – History of the teaching and learning of mathematics

Co-chairs: Fulvia **Furinghetti** (Italy), Alexander **Karp** (USA)
Team members: Henrike **Allmendinger** (Germany), Johan **Prytz** (Sweden),
Harm Jan **Smid** (Netherlands)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: K: purple, Law Building, room 12

Session Chair: Fulvia **Furinghetti**

Presentations: Guenter **Graumann***
(University of Bielefeld)

CONCEPTIONS OF ARITHMETIC EDUCATION IN GERMANY FROM
A HISTORICAL PERSPECTIVE

María José **Madrid*** (1), Alexander **Maz-Machado** (1), Carmen **León-Mantero** (1), Carmen **López** (2)
(1: Universidad de Córdoba; 2: Universidad de Salamanca)

THE STUDY OF PRACTICE ARITHMETIC IN SPAIN DURING THE SIXTEENTH CENTURY

María Teresa González **Astudillo***, Myriam Codes **Valcarce**
(University of Salamanca)

GEOMETRY LESSONS BY PEDRO PUIG ADAM

Irene Papadaki, Athanasios **Gagatsis***, Elena **Kiliari**
(University of Cyprus)

THE ARITHMETIC OF PETROS ARGYROS IN RELATION WITH THE ABACI AND
THE FIRST GREEK PRINTED BOOK OF ARITHMETIC LOGARIASTIKI

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: K: purple, Law Building, room 12

Session Chair: Henrike **Allmendinger**

Presentations: Eisso Johannes **Atzema***
(University of Maine)

PROVING THE CONVERSE OF PTOLEMY'S THEOREM: A CASE STUDY ON
GEOMETRICAL RESEARCH IN THE FIRST HALF OF THE 19TH CENTURY

Emily Timmons Hamilton **Redman***
(University of Massachusetts)

(INTER)NATIONALISM AND SHIFTING ANXIETIES: THE HISTORY OF MATH
EDUCATION REFORM IN THE 20TH CENTURY UNITED STATES

Ildar **Safuanov***

(Moscow City Pedagogical University)

HISTORY OF GENETIC APPROACH TO MATHEMATICS TEACHING IN RUSSIA

Eliete Grasiela **Both*** (1), Bruna Camila **Both** (2)

(1: Instituto Federal de Educação Ciência e Tecnologia de Mato Grosso – IFMT; 2: Universidade Estadual
Paulista “Júlio de Mesquita Filho” – Unesp)

BARRA DO GARÇAS – MATO GROSSO: (MATHEMATICS) TEACHERS FORMATION
IN 1970 AND 1980 DECADES





Marvin Roberto **Mendoza*** (1), Luis Armando **Ramos** (2)

(1: National Autonomous University of Honduras;

2: Francisco Morazán National Pedagogical University)

TEACHING MATHEMATICS IN HONDURAS: ORIGINS, DEVELOPMENT,
AND CHALLENGES

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 12

Session Chair: Harm Jan **Smid**

Presentations: Nicola M. R. **Oswald*** (1,2), Nadine **Benstein** (1)

(1: University of Wuppertal; 2: Würzburg University)

COMBINING CONCEPT MAPS AND NETWORK MAPS TO VISUALIZE HISTORY
OF MATHEMATICS – CASE STUDY ON WALTHER LIETZMANN

Zohre **Ketabdar*** (1), Maryam **Ketabdar** (2)

(1: Science and research university of Tehran; 2: Roshangar secondary school)

AN OVERVIEW OF THE HISTORY OF TEACHER TRAINING IN IRAN

TSG 25 – The Role of History of Mathematics in Mathematics Education

Co-chairs: Costas **Tzanakis** (Greece), Xiaoqin **Wang** (China)

Team members: Kathleen **Clark** (USA), Tinne Hoff **Kjeldsen** (Denmark), Sebastian **Schorcht** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 0080

Session Chair: David **Guillemette**

Presentations: Charlotte **De Varent***

(ERC SAW CNRS PARIS 7 DIDEROT)

CONSEQUENCES OF THE USE OF AN ANCIENT MATHEMATICAL
TABLET IN THE CLASSROOM

Panagiota **Kotarinou*** (1), Charoula **Stathopoulou** (2), Eleni **Gana** (2)

(1: School of Arts of Geraka; 2: University of Thessaly)

EXPANDING CONTEXTS FOR TEACHING UPPER SECONDARY SCHOOL GEOMETRY

Yanjun **Hong***

(East China Normal University)

TEACHING MATHEMATICS FROM THE PERSPECTIVE OF HPM: PROCESS AND MODEL

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 0080

Session Chairs: Susanne **Spies**, Sebastian **Schorcht**

Presentations: Wei Beng **Poh** (1), Jaguthsing **Dindyal*** (2)

(1: MOE Singapore; 2: National Institute of Education Singapore;

2: National Institute of Education Singapore)

A HISTORICAL PERSPECTIVE FOR TEACHING CALCULUS:
THE DEVELOPMENT OF A LESSON PACKAGE

Sotirios **Syriopoulos***

(2nd High School)

THE COURSE OF A THEOREM IN TIME: A MATHEMATICAL NARRATION
ADDRESSED TO 11TH GRADE STUDENTS.

Taiki **Suzuki***

(Saitama University)

THE METHOD OF GEOMETRICAL SOLUTION OF EQUATIONS USING GEOGEBRA:
FOCUS ON THE ROOT OF QUADRATIC EQUATIONS IN ARS MAGNA

Yili **Yang***, Xiaoqin **Wang**

(East China Normal University)

AN INSTRUCTIONAL DESIGN ABOUT INCLINATION AND SLOPE

Huang **Youchu***

(Wenzhou University)

A QUALITATIVE STUDY ON THE DEVELOPMENT OF PRE-SERVICE TEACHERS'
KNOWLEDGE IN THE HISTORY OF MATHEMATICS – A CASE OF THE PYTHAGOREAN
THEOREM

Wilhelm **Sternemann***

(Mathematisches Institut der Universität Münster)

ABOUT CONTINUOUS COMPOUND INTEREST BY JACOB BERNOULLI

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 0080

Session Chair: Snezana **Lawrence**

Presentations: Gülçin **Tan-Sisman**, Büsra **Kirez***

(Hacettepe University)

HISTORY OF MATHEMATICS IN THE TURKISH MIDDLE SCHOOL MATHEMATICS
CURRICULUM AND TEXTBOOKS

Monserrat Rodríguez **Vásquez***, Jesús Romero **Valencia**

(Universidad Autónoma de Guerrero)

HISTORY OF MATHEMATICS IN THE CLASSROOM:
ALGORITHM OF THE ADDITION AND SUBTRACTION

ChunYan **Qi***

(East China Normal University)

RESEARCH ON THE PROBLEM POSING OF THE HPM

Barbara **Schmidt-Thieme*** (1), Tanja **Hamann** (2)

(1: Universität Hildesheim; 2: Universität Hildesheim)

A CURRICULUM FOR HISTORY OF MATHEMATICS IN PRE-SERVICE
TEACHER EDUCATION





Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 0080

Session Chairs: Patricia **Baggett**, Kathrein Ysette **Weiss-Pidstrygach**

Presentations: Ke **Wang** (2), Jiachen **Zou*** (1)

(1: East China Normal University; 2: Texas A&M University)

THE MODEL OF TEACHERS' PROFESSIONAL DEVELOPMENT ON INTEGRATING THE HISTORY OF MATHEMATICS INTO TEACHING IN SHANGHAI

ZhongYu **Shen***

(East China Normal University)

TEACHING OF APPLICATION OF CONGRUENT TRIANGLES FROM THE PERSPECTIVE OF HPM

Fabián Wilfrido Romero **Fonseca***, Rosa María Farfán **Márquez**

(Center for Research and Advanced Studies of the National Polytechnic Institute)

THE SOCIOEPISTEMOLOGIC APPROACH TO THE DIDACTIC PHENOMENON: AN EXAMPLE

Thomas **Krohn*** (1), Karin **Richter** (2)

(1: University of Leipzig; 2: Martin-Luther-University of Halle-Wittenberg)

AUTHENTIC & HISTORIC ASTRONOMICAL DATA MEET NEW MEDIA IN MATHEMATICS EDUCATION

Slim **Mrabet***

(Tunisia)

THE DEVELOPMENT OF THALES THEOREM THROUGHOUT HISTORY

TSG 26 – Research on teaching and classroom practice

Co-chairs: Yoshinori **Shimizu** (Japan), Mary Kay **Stein** (USA)

Team members: Birgit **Brandt** (Germany), Helia **Oliveira** (Portugal), Lijun **Ye** (China)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: H: orange, Educational Building, room 213

Group A – Session Chair: Mary Kay **Stein**

Presentations: Dae **Hong***

(University of Iowa)

MAINTAINING COGNITIVE DEMAND DURING LIMIT LESSONS: A CHALLENGING CLASS PRACTICE

Weiping **Zhang***

(Shanghai Normal University)

ELABORATING ON RELATIONSHIP BETWEEN INSTRUCTION SETUP AND STUDENTS' OPPORTUNITY TO LEARN IN CHINESE CLASS

Martha Leticia García **Rodríguez*** (1), Isaias Miranda **Viramontes** (2)

(1: Instituto Politécnico Nacional; 2: Instituto Politécnico Nacional; 2: Instituto Politécnico Nacional)

INCREASING THE COGNITIVE DEMAND OF A VECTORIAL FUNCTION TASK VIA THE INSTRUCTOR-STUDENTS INTERACTION

Talli **Nachlieli***, Yafim **Katz**

(Levinsky College of Education)

TEACHING PRACTICES THAT PROMOTE PARTICIPATION WHILE SOLVING HIGH COGNITIVE DEMANDING TASKS

Location: H: orange, Educational Building, room 20

Group B – Session Chair: Yoshinori **Shimizu**

Presentations: Hüseyin **Özdemir***

(Bursa Hürriyet Vocational and Technical High School)

TEACHERS' BELIEFS AND CLASSROOM PRACTICES VERSUS STUDENTS' PERCEPTIONS FOR MATHEMATICS INSTRUCTION: TURKISH CASE

Binod Prasad **Pant***, Bal Chandra **Luitel**

(Kathmandu University)

BELIEFS ABOUT THE NATURE OF MATHEMATICS AND ITS PEDAGOGICAL INFLUNCES

Natcha **Kamol***

(Chiang Mai University)

THAI MIDDLE SCHOOL STUDENTS' VALUE IN AN EFFECTIVE MATHEMATICS LESSON: THREE CASE STUDIES

Shintia **Revina***, Frederick **Leung**

(The University of Hong Kong)

INFLUENCE OF CULTURES IN THE IMPLEMENTATION OF REALISTIC MATHEMATICS EDUCATION: A PRELIMINARY FINDINGS

Location: H: orange, Educational Building, room 21

Group C – Session Chair: Birgit **Brandt**

Presentations: Jae Ki **Lee*** (1), Susan **Licwinko** (2), Nicole **Taylor-Buckner** (3)

(1: Borough of Manhattan Community College; 2: Borough of Manhattan Community college;

3: Borough of Manhattan Community College)

ACCESSING A CONCEPTUAL APPROACH OF RATIONAL NUMBERS

Aytug Ozaltun **Celik*** (1), Esra Bukova **Güzel** (2)

(1: Pamukkale University; 2: Dokuz Eylül University)

REVEALING OZGUR'S THOUGHTS OF A QUADRATIC FUNCTION WITH A CLINICAL INTERVIEW: CONCEPTS AND THEIR UNDERLYING REASONS

Eugenia **Marmolejo***

(Universidad Nacional Autónoma de México)

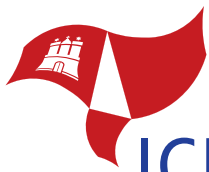
SOLVING RADICAL EQUATIONS: IDENTIFYING THE CORRECT SOLUTIONS

Rok **Lipnik***

(Gimnazija Celje – Center)

MATHS HOMEWORK AND GRADES – ARE THEY CORRELATED?





Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 213

Group A – Session Chair: Helia **Oliveira**

Presentations: Edyta **Nowinska*** (1,2)

(1: University of Osnabrueck; 2: Adam Mickiewicz University od Poznan)

RATING SYSTEM FOR ANALYZING AND ASSESSING A METACOGNITIVE-DISCURSIVE QUALITY OF MATHS LESSONS

Carmel **Mesiti***, David **Clarke**

(The University of Melbourne)

THE LEXICON PROJECT: DOCUMENTING AUSTRALIA'S PEDAGOGICAL NAMING SYSTEM & COMPARING IT WITH OTHERS FROM AROUND THE WORLD

Christine **Suurtamm**, Richard **Barwell**, Brenna **Quigley***

(University of Ottawa)

I SAW THAT TOO: MUTUAL RECOGNITION IN RESEARCHERS OBSERVING TEACHERS OBSERVING MATHEMATICS TEACHING

Mark **Hoover***, Minsung **Kwon**, Deborah **Loewenberg Ball**

(University of Michigan)

DEVELOPING METHOD FOR STUDYING THE WORK OF TEACHING

Zelha Tunc **Pekkan***, R. Didem **Taylan**, Bengi **Birgili**, Utkun **Aydın**, Mustafa **Özcan**

(MEF University)

ACADEMICIANS AS TEACHERS: NURTURING TEACHING EXPERIENCE

Sharon **Strickland*** (1), Amanda **Milewski** (2)

(1: Texas State University; 2: University of Michigan)

(TOWARD) A FUNCTIONAL FRAMEWORK FOR DESCRIBING TEACHERS' PRACTICES OF REACTING

Location: H: orange, Educational Building, room 20

Group B – Session Chair: Liyun **Ye**

Presentations: Hui-chuan **Li*** (1), Andreas **Stylianides** (2)

(1: Universiti Brunei Darussalam; 2: University of Cambridge)

THE ROLES OF TEACHER AND STUDENTS DURING A PROBLEM-BASED LEARNING INTERVENTION

Su **Liang***

(California State University)

INTEGRATING TEACHING RESEARCH WITH CLASSROOM PRACTICE

Binyan **Xu**, Guangtian **Zhu***

(East China Normal University)

CHINESE STUDENTS' ACHIEVEMENTS IN THE PROJECT-BASED CLASSROOM PRACTICE OF STATISTICS

Tika Ram **Pokhrel***

(Kathmandu University)

ACTIVITY BASED MATHEMATICS INSTRUCTION: EXPERIENCES IN ADDRESSING THE 21ST CENTURY SKILLS

Dominic **Manuel***, Annie **Savard**
(McGill University)

DISCUSSING TEACHING MATHEMATICS THROUGH VIDEO-RECORDED LESSONS:
WHAT QUEBEC TEACHERS SAY ABOUT INQUIRY-BASED LEARNING

Location: H: orange, Educational Building, room 21

Group C – Session Chair: Mary Kay **Stein**

Presentations: Verónica Ester **Parra*** (1,2), María Rita **Otero** (1,2)

(1: Universidad Nacional del Centro de la Provincia de Buenos Aires (UNCPBA).;

2: Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET).)

RESEARCH ON TEACHING AND CLASSROOM PRACTICE: PERFORMING A RESEARCH
AND STUDY COURSE IN THE SECONDARY LEVEL

Tuula **Maunula***

(University of Gothenburg)

IS $Y = 6X$ A POINT OR A LINE? LEARNER CONTRIBUTIONS IN MATHEMATICS LESSONS

Fiona Mary **McDiarmid***

(Cognition Education)

HOW DO TEACHERS USE RESEARCH IN AN INQUIRY STANCE

Elaine **Simmt***

(University of Alberta)

INTERPRETING TEACHER COMMENTS ABOUT TEACHING: UNDERSTANDING PEDAGOGY

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: H: orange, Educational Building, room 213

Group A – Session Chair: Yoshinori **Shimizu**

Presentations: **Nympha** Afable **Beltran-Joaquin***

(University of the Philippines)

DEVELOPING PROBLEM-SOLVING SKILLS THROUGH CO-GENERATIVE PEER TEACHING

Lu Pien **Cheng***

(National Institute of Education)

THE USE OF FLIPPED CLASSROOM IN THE SINGAPORE PRIMARY
MATHEMATICS CLASSROOM

Wai Pong Au **Yeung***

(Caritas Yuen Long Chan Chun Ha Secondary School)

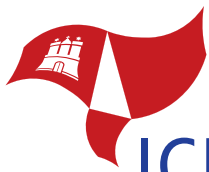
THE INFLUENCE OF FLIPPED CLASSROOM INSTRUCTION ON STUDENTS'
UNDERSTANDING AND PERFORMANCE IN SOLVING QUADRATIC EQUATIONS

Betina **Duarte*** (1), Analia **Bergé** (2)

(1: Universidad Pedagógica; 2: Université du Québec à Rimouski)

GENERATING AND VALIDATING CONJECTURES: CONDITIONS AND ALTERNATIVES
FOR CLASS MANAGEMENT





Location: H: orange, Educational Building, room 20

Group B – Session Chair: Birgit **Brandt**

Presentations: Jihyun **Hwang***, Dae S. **Hong**, Kyong Mi **Choi**
(University of Iowa)

USE OF INSTRUCTIONAL EXAMPLES IN CALCULUS CLASSROOMS

Ramazan **Avcu*** (1), Çigdem **Haser** (2)

(1: Aksaray University; 2: Middle East Technical University)

EXAMPLES THAT MIRROR MIDDLE SCHOOL MATHEMATICS TEACHERS'
CLASSROOM PRACTICES ABOUT ORDERING RATIONAL NUMBERS

Valeska Valentina **Grau**, David Daniel **Preiss**, María Elisa **Calcagni***

(Pontificia Universidad Católica de Chile)

HOW DO CHILEAN PRE-SERVICE AND IN-SERVICE TEACHERS PERCEIVE TEACHING
STRATEGIES THAT FOSTER METACOGNITION

Nan **Zhang*** (1), Yeping **Li** (2), Guangming **Wang** (1)

(1: Tianjin Normal University; 2: Texas A&M University)

VIDEO-BASED RESEARCH ON TEACHING BEHAVIOR IN TECHNOLOGY-RICH
MATHEMATICS CLASSROOM IN CHINA

Location: H: orange, Educational Building, room 21

Group C – Session Chair: Helia **Oliveira**

Presentations: Anna Marie **Conner*** (1), Laura M. **Singletary** (2)

(1: University of Georgia; 2: Lee University)

IN SEARCH OF PRODUCTIVE ARGUMENTATION: AN EXPLORATORY EXAMINATION
OF TWO CLASSROOMS

Colleen M. **Eddy*** (1), Sarah **Pratt** (1), Sampan **Thinwiangthong** (2),

Wipaporn **Suttiamporn** (2), Trena **Wilkerson** (3), Gabriel **Matney** (4), Jensamut **Saengpun** (5),

Anake **Sudejamnong** (6), Kasem **Premprayoon** (7)

(1: University of North Texas; 2: KhonKaen University; 3: Baylor University;

4: Bowling Green State University; 5: Chiang Mai University; 6: Suratthani Rajabhat University;

7: Thaksin University)

COMMON OBSERVATION TOOL FOR MATH TEACHER'S USE OF FORMATIVE
ASSESSMENT IN THE U.S. AND THAILAND

Sarah **Pratt*** (1), Colleen **Eddy** (1), Gabriel **Matney** (2), Trena **Wilkerson** (3),

Maitree **Inprasitha** (4), Narumol **Inprasitha** (4), Somkuan **Srichompoo** (4), Narumon **Changsri** (4),

Thanya **Kadroon** (5), Pimlak **Moonpoo** (6)

(1: University of North Texas; 2: Bowling Green State University; 3: Baylor University;

4: KhonKaen University; 5: Suratthani Rajabhat University; 6: Valaya Alongkorn Rajabhat University)

FACILITATING TEACHERS' INSTRUCTION TO ELICIT STUDENT PROCESSES IN
THINKING OF MATHEMATICS

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: H: orange, Educational Building, room 213

Group A – Session Chair: Liyun **Ye**
Presentations: Justin Davis **Valentin***
(University of Seychelles)

CLASSROOM REFORM IN SMALL DEVELOPING STATES:
THE CASE OF THE MATHEMATICS LESSON STRUCTURE IN THE SEYCHELLES

Wei **Sun***, Xuefeng **Li**
(Towson Univeristy)

A COMPARATIVE ANALYSIS OF TEACHING PRACTICE IN SHANGHAI, CHINA

Hui Min **Chia***, Chap Sam **Lim**
(UNIVERSITI SAINS MALAYSIA)

COMPARING THE TEACHING AND CLASSROOM PRACTICES OF TWO PRIMARY
MATHEMATICS RESEARCH LESSONS ON THE SAME TOPIC WHOLE NUMBE

Fang **Liang***, Xiaotian **Sun**
(Minzu University of China)

CASE STUDY ON JUNIOR MATHEMATICS CLASSROOM TEACHING IN MINORITY AREAS

Sousada **Chidthachack*** (1), Forster D. **Ntow** (2), Emmanuel A. **Bofah** (3)

(1: University of Minnesota; 2: University of Cape Coast; 3: University of Helsinki)
TEACHING FOR CONCEPTUAL UNDERSTANDING AND MATHEMATICS ACHIEVEMENT
IN AN AFRICAN COMPARATIVE CONTEXT

Location: H: orange, Educational Building, room 20

Group B – Session Chair: Mary Kay **Stein**
Presentations: Debra Lynn **Plowman***
(The University of Texas)

TEACHERS' NOTICING OF AND RESPONSES TO STRUGGLING STUDENTS

Anna-Marietha **Vogler***
(TU Dortmund)

NO NEED TO FOCUS INTERACTIONS? WHAT THE CONSTRUCT OF NOTICING
SHOWS ABOUT TEACHERS' SUPPORTS IN MATHEMATICS CLASSROOM

Duncan **Mhakure***
(University of Cape Town)

MATHEMATICS TEACHER NOTICING THROUGH THE LENS OF
PRODUCTIVE QUESTIONING

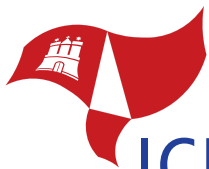
Lindsey **Mann***
(University of Michigan)

HANDING OFF THE MATHEMATICAL WORK TO STUDENTS:
A DECOMPOSITION OF TEACHING PRACTICE

Summer **Bateiha***, Ryad **Ghanam**, Zeyad **Bateiha**
(Virginia Commonwealth University in Qatar)

MATHEMATICAL GROWTH THROUGH ERROR





Location: H: orange, Educational Building, room 21

Group C – Session Chair: Yoshinori **Shimizu**

Presentations: Eva Tsz Wai **Lam***

(True Light Middle of Hong Kong)

STUDYING TEACHERS' USE OF METAPHORS IN THE CONTEXT OF DIRECTED NUMBERS

Isabel **Velez***

(Instituto de Educação – Universidade de Lisboa)

TEACHERS' ACTIONS REGARDING GRADE 3 STUDENTS' REPRESENTATIONS

Alison Mary **Goss***

(University of Ottawa)

MONTESSORI TEACHERS' EXPERIENCES TEACHING FRACTIONS WITH MANIPULATIVES

Immaculate Kizito **Namukasa***

(The university of western ontario)

TEACHING PRACTICES IN THE MONTESSORI SYSTEM

Paola **Carante***, Ornella **Robutti**

(Università di Torino)

MERLO ITEMS FOR EXPLORING AND DISCUSSING ABOUT MATHEMATICAL MEANINGS

TSG 27 – Learning and cognition in mathematics

Co-chairs: Wim **van Dooren** (Belgium), Gaye **Williams** (Australia)

Team members: Pablo **Dartnell** (Chile), Anke **Lindmeier** (Germany), Jérôme **Proulx** (Canada)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 772

Session Chairs: Wim **van Dooren**, Anke **Lindmeier**

Presentations: Samantha Sarah **Morrison***, Hamsa **Venkatakrishnan**

(University of the Witwatersrand)

MANAGING TENSIONS BETWEEN DIAGNOSTIC ASSESSMENT AND SUGGESTED FOLLOW-UP TEACHING PATHWAYS

Amir Hossein **Ashna***, Samaneh **Sahebzamani**

(Refah University Colloge)

COGNITIVE SUBTYPES OF MATHEMATICS LEARNING DIFFICULTIES IN PRIMARY EDUCATION

Jinyu **Zhang***

(East China Normal University)

PROCEDURAL KNOWLEDGE DEVELOPMENT MODEL IN CHINESE AND GERMAN CLASSROOMS – THEORETICAL REFLECTIONS AND A CASE STUDY

Patricia **Lamadrid***, Marta E. **Valdemoros**

(CINVESTAV)

REFLECTION ON DIDACTIC DESIGN FOR THE TEACHING OF NATURAL NUMBER

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: I: blue, Philosophical Tower, room 772

Session Chairs: Wim **van Dooren**, Gaye **Williams**

Presentations: Ryan **Ziols***, Perceval **Matthews**

(University of Wisconsin-Madison)

BEYOND COMPARISON AND COUNTING: WHAT A "SENSE OF PROPORTION"
MIGHT MEAN FOR MATHEMATICS EDUCATION

Caroline **Long***

(University of Pretoria)

LEARNING PATHWAYS WITHIN THE MULTIPLICATIVE CONCEPTUAL FIELD:
INSIGHTS REFLECTED THROUGH A RASCH MEASUREMENT FRAMEWORK

Kazuya **Kageyama***

(Hiroshima University)

WHAT ARE THE DRIVING FORCES TO HAVE STUDENTS NOTICE MATHEMATICALLY?

Thorsten **Scheiner** (1), Márcia M. F. **Pinto*** (2)

(1: University of Hamburg; 2: Federal University of Rio de Janeiro)

ABSTRACTION IN MATHEMATICS: TAKING ACCOUNT FOR THE INCREASING
COMPLEXITY AND CONTEXT-SENSITIVITY OF THE KNOWLEDGE SYSTEM

Marta Elena Valdemoros **Álvarez***, Patricia **Lamadrid**, Mercedes **Ramírez**

(CINVESTAV)

THE FUTURE TEACHER, MULTIPLICATION AND DIVISION OF FRACTIONS

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 772

Session Chairs: Gaye **Williams**, Jérôme **Proulx**

Presentations: Stella **Pede*** (1), Rita **Borromeo-Ferri** (1), Frank **Lipowsky** (2),

Julia **Schwabe** (2), Natascha **Schupp** (2)

(1: Institute of Mathematics; 2: Institute of Humanities)

DESIRABLE DIFFICULTIES IN MATHEMATICS USING INTERLEAVING PRACTICES

Dragan **Trninic***

(Nanyang Technological University)

THE EDUCATIONAL ROLE OF PRACTICE

Sebastian **Kollhoff***

(Bielefeld University)

ANALYZING PROCESSES OF TRANSFER IN STUDENT INTERACTION

Carol **Carruthers***

(Seneca College)

CAN THE AFFORDANCES OF TECHNOLOGY USED IN A FOUNDATIONAL COURSE
GIVE INSIGHT INTO HOW MATHEMATICS IS LEARNED IN COLLEGE?





Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: I: blue, Philosophical Tower, room 772

Session Chairs: Gaye **Williams**, Pablo **Dartnell**

Presentations: José Antonio Juárez **López*** (1), José Gabriel Sánchez **Ruiz** (2),

Lidia Aurora Hernández **Rebollar** (1), Josip Slisko **Ignjatov** (1)

(1: Benemérita Universidad Autónoma de Puebla; 2: Universidad Nacional Autónoma de México)

LEVELS OF COHERENCE IN THE SITUATION MODEL CONSTRUCTION OF A WORD PROBLEM

Guangming **Wang***, Wenjuan **She**, Nan **Zhang**

(Tianjin Normal University)

A RESEARCH ON METACOGNITIVE CHARACTERISTICS OF HIGHLY EFFECTIVE MATHEMATICS LEARNERS IN HIGH SCHOOL IN CHINA

Karen G. **Skilling*** (1), Gabriel J. **Stylianides** (2)

(1: King's College London; 2: University of Oxford)

TEACHERS' VIEWS ABOUT COGNITIVE ENGAGEMENT IN MATHEMATICS FOR DIFFERENT GROUPS OF STUDENTS

TSG 28 – Affect, beliefs and identity in mathematics education

Co-chairs: Markku **Hannula** (Finland), Francesca **Morselli** (Italy)

Team members: Emine **Erktin** (Turkey), Maike **Vollstedt** (Germany), Qiao-Ping **Zhang** (Hong Kong)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: B: dark-brown, East Wing Building, room 222

Group A – Session Chair: Emine **Erktin**

Presentations: Gayanthi Malika **Wadanambi*** (1), Frederick K. S. **Leung** (2)

(1: Ruhuna National College of Education; 2: The University of Hong Kong)

SRI LANKA'S PRE-SERVICE TEACHERS' PROFESSED BELIEFS ABOUT NATURE OF MATHEMATICS, AND LEARNING AND TEACHING MATHEMATICS

Qiao-Ping **Zhang*** (1), Natthapoj Vincent **Trakulphadetkrai** (2)

(1: The Chinese University of Hong Kong; 2: University of Reading)

HONG KONG PRIMARY MATHEMATICS TEACHERS' BELIEFS ABOUT THE INTEGRATION OF CHILDREN'S LITERATURE IN MATHEMATICS TEACHING

Ping **Yu***, Haiyue **Jin**

(Nanjing Normal University)

A CORRELATION STUDY ON EPISTEMOLOGICAL BELIEFS, THEORETICAL KNOWLEDGE AND TEACHING BEHAVIOR OF MATHEMATICS TEACHERS

Location: B: dark-brown, East Wing Building, room 124

Group B – Session Chair: Markku S. **Hannula**

Presentations: Julie-Ann **Edwards** (1), Lotta **Viika*** (2)

(1: University of Southampton; 2: Aldworth School)

MATHEMATICS ANXIETY IN SCHOOL: IMPLICATIONS OF GENDER DIFFERENCES

Antonio **Lara-Barragán** (1), Cristina **Eccius-Wellmann** (1), Stefan **Freitag*** (2), Bastian **Martschink** (2)
(1: Universidad Panamericana; 2: Hochschule Bonn-Rhein-Sieg)

EXPLAINING DIFFERENCES IN MATH-ANXIETY PROFILES BETWEEN GERMAN STUDENTS AND MEXICAN STUDENTS

Marilyn **Curtain-Phillips***

(Fairfield County Schools)

HOW TO REDUCE MATHEMATICS ANXIETY IN THE CLASSROOM

Location: B: dark-brown, East Wing Building, room 108

Group C – Session Chair: Francesca **Morselli**

Presentations: Theresa **Krassnigg***

(Alpen-Adria-University Klagenfurt)

PARENTS' AND THEIR CHILDREN'S BELIEFS TOWARDS MATHEMATICS AND ITS TEACHING

He **Wei***, Jia **Xujie**, Zhao **Jie**

(Minzu University of China)

INVESTIGATION AND ANALYSIS ABOUT STUDENT MATHEMATICS LEARNING ATTITUDE IN CHINESE RURAL AREAS

Fangchun **Zhu***

(China)

STUDENTS' CONFIDENCE IN LEARNING MATHEMATICS: A STUDY OF STUDENTS FROM SHANGHAI

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: B: dark-brown, East Wing Building, room 222

Group A – Session Chair: Emine **Erktin**

Presentations: Marina **De Simone***

(École normale supérieure de Lyon)

THE RÆMOTIONALITY OF A MATHEMATICS TEACHER EXPLAINING LINEAR EQUATIONS WITH GEOGEBRA

Shashidhar **Belbase***

(Zayed University)

VISUALIZATION DEBUNKS MEANING AND POWER – A BELIEF

Sabine **Stöcker-Segre*** (1,2)

(1: Achva Academic College; 2: Davidson Institute of Science Education)

IDENTITY EMPOWERING MATH – EXPERIENCES WITH A JEWISH-ARABIC MATH SEMINAR

Hyun Jung **Kang*** (1), Paula Guerra **Lombardi** (2)

(1: University of Northern Colorado; 2: Kennesaw State University)

LISTENING FOR THE DIFFERENCE THROUGH TEACHER IDENTITY

Okan **Arslan***, Çigdem **Haser**

(Middle East Technical University)

HOW DID I BECOME SUCH A MATHEMATICS TEACHER?





Location: B: dark-brown, East Wing Building, room 124

Group B – Session Chair: Francesca **Morselli**

Presentations: Bumi **Kim***

(Wonkwang University)

RELATIONSHIPS AMONG STUDENTS' ACADEMIC STRESS
AND MATHEMATICS LEARNING MOTIVATION

Xiaoqing **Li***

(Shenzhen University)

A STUDY OF ACHIEVEMENT EMOTION IN MATHEMATICS IN THE CHINESE
PRIMARY STUDENTS

Cao **Chunyan***

(Northwest Normal University)

THE SURVEY AND ANALYSIS OF JUNIOR SCHOOL STUDENTS' MATHEMATICS
ADVERSITY QUOTIENT

Hongbiao **Yin** (1), Wei **Lin*** (2)

(1: The Chinese University of Hong Kong; 2: The Chinese University of Hong Kong)

EFFECTS OF EMOTIONAL SCAFFOLDS ASSISTED COGNITIVE ADVANCE ORGANIZERS
ON ELEMENTARY STUDENTS' MATHEMATICS LEARNING

Amanda Marina **Andrade Medeiros***

(Universidade de Brasília)

MATHEMATICS LEARNING DIFFICULTY AND AFFECTIVITY:
AN INVESTIGATION IN THE POSTGRADUATE WORKS IN BRAZIL

Location: B: dark-brown, East Wing Building, room 108

Group C – Session Chair: Francesca **Morselli**

Presentations: Anne Margaret **Cawley***, Max **Altman**

(University of Michigan)

"WHY AM I HERE?": CHANGES IN STUDENTS' SELF-ASSESSMENT AND
MATHEMATICAL BELIEFS DURING A DEVELOPMENTAL MATHEMATICS COURSE

Forster D. **Ntow*** (01), Lesa M. Covington **Clarkson** (02)

(1: University of Cape Coast; 2: University of Minnesota)

WHAT DOES IT MEAN TO BELONG? HIGH SCHOOL STUDENTS' SENSE OF
BELONGING IN MATHEMATICS CLASSROOMS

Boris **Girnat***

(University of Applied Sciences and Arts Northwestern Switzerland School of Teacher Education)

MEASURING STUDENTS' BELIEFS ON TEACHING METHODS AND MATHEMATICAL
WORLDVIEWS FOR A LARGE SCALE ASSESSMENT

Maria Reyna **Cruz***, Maria D. **Cruz Quiñones**, Maria Del Rosario **Cruz Quiñones**

(Universidad Autónoma de Cd. Juárez)

STUDENTS' DISPOSITION TOWARDS MATHEMATICS AT THE HIGH SCHOOL LEVEL

Ralf **Erens***

(University of Education Freiburg)

BELIEF CHANGES: THE MATHEMATICAL SOCIALISATION OF CALCULUS TEACHERS

Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: B: dark-brown, East Wing Building, room 222

Group A – Session Chair: Qiao-Ping **Zhang**

Presentations: Patrick **Barmby***

(University of the Witwatersrand)

PRE-SERVICE PRIMARY TEACHERS' ATTITUDES TOWARDS MATHEMATICS:
AN EMPIRICAL STUDY GROUNDED IN THE SOUTH AFRICAN CONTEXT

Esther M. H. **Billings***, Lisa **Kasmer**

(Grand Valley State University)

FOSTERING A MUTUALLY BENEFICIAL RELATIONSHIP BETWEEN FACULTY AND
STUDENTS TO PROMOTE A POSITIVE LEARNING ENVIRONMENT

Mark **Arvidson***, Elizabeth **Rivas**

(Azusa Pacific University)

EXAMINING THE ATTITUDES OF PRE-SERVICE ELEMENTARY SCHOOL TEACHERS
TOWARD MATHEMATICS

Tiziana **Pacelli*** (1), Cristina **Coppola** (1), Benedetto **Di Paola** (2),

Pietro **Di Martino** (3), Cristina **Sabena** (4)

(1: Università degli studi di Salerno; 2: Università degli studi di Palermo;

3: Università degli studi di Pisa; 4: Università degli studi di Torino)

MATHEMATICS FUTURE PRIMARY TEACHERS' AFFECT: BACK TO THE FUTURE

Location: B: dark-brown, East Wing Building, room 124

Group B – Session Chair: Francesca **Morselli**

Presentations: Valorie Lynn **Zonnefeld***

(Dordt College)

IMPLICATIONS OF GROWTH MINDSET TRAINING ON UNDERGRADUATE
STATISTICS STUDENTS BY GENDER

Ana Belén Montoro **Medina*** (1), Francisco Gil **Cuadra** (2), José Antonio Fernández **Bravo** (1),

Juan Jesús Barbarán **Sánchez** (3)

(1: Camilo José Cela University; 2: University of Almería; 3: University of Granada)

PROBLEM SOLVING: MAIN "FLOW" ACTIVITY IN MATHEMATICS
TO UNIVERSITY STUDENTS

Paul **Hernandez-Martinez***, Helen **Harth**

(Loughborough University)

EMOTIONS IN UNDERGRADUATE MATHEMATICAL MODELLING GROUP WORK

Josefa Perdomo **Díaz*** (1,2), Patricio **Felmer** (1,2), Valentina **Giaconi** (1,2)

(1: Centro de Modelamiento Matemático; 2: Centro de Investigación Avanzada en Educación)

PRIMARY AND SECONDARY STUDENTS' VIEWS OF THEMSELVES IN RELATION WITH
MATHEMATICS AND DIFFERENCES BETWEEN GRADES





Location: B: dark-brown, East Wing Building, room 108

Group C – Session Chair: Markku S. **Hannula**

Presentations: Tracy Elyse **Dobie***

(Northwestern University)

INTERDEPENDENCE IN MIDDLE SCHOOL STUDENTS' CONCEPTIONS OF USEFULNESS IN MATHEMATICS

Chunlian **Jiang*** (1), Wee Tiong **Seah** (2), Tasos **Barkatsas** (3), Io Keong **Cheong** (1)

(1: University of Macau; 2: University of Melbourne; 3: RMIT University)

WHAT MACAO STUDENTS VALUE IN MATHEMATICS LEARNING

Hengjun **Tang*** (1), Wee Tiong **Seah** (2), Weizhong **Zhang** (1)

(1: College of Teacher Education; 2: Melbourne Graduate School of Education)

WHAT GET VALUED SIMILARLY AND DIFFERENTLY IN THE AUSTRALIAN AND CHINESE MATHEMATICS CURRICULA: A COMPARATIVE STUDY

Maike **Vollstedt***, Christoph **Duchhardt**

(University of Bremen)

CAN THE STUDENTS' PERSONAL MEANING OF LEARNING MATHEMATICS BE ASSESSED WITH A PAPER AND PENCIL QUESTIONNAIRE?

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: B: dark-brown, East Wing Building, room 222

Group A – Session Chair: Qiao-Ping **Zhang**

Presentations: Yung-Chi **Lin*** (1), Siew Yin **Ho** (2)

(1: National Changhua University of Education; 2: Nanyang Technological University)

WHAT STUDENTS THINK ABOUT MATHEMATICS TEACHERS' DRAWINGS OF A CLASSROOM TEACHING

Xiaoli **Lu***, Frederick K. S. **Leung**

(The University of Hong Kong)

INVESTIGATING SHANGHAI BEGINNING MATHEMATICS TEACHERS' BELIEFS IN THEIR FIRST TWO TEACHING YEARS

Qian **Chen*** (1), Frederick Koon Shing **Leung** (2)

(1: Sichuan Normal University; 2: The University of Hong Kong)

FACTORS INFLUENCING TEACHERS' BELIEF CHANGE IN THE CONTEXT OF CHINA'S RECENT MATHEMATICS CURRICULUM REFORM

Figen **Uysal*** (1), Yüksel **Dede** (2)

(1: Bilecik eyh Edebalı University; 2: Gazi University)

THE EFFECT OF TEACHING EXPERIENCE ON TURKISH MATHEMATICS TEACHERS' MATHEMATICAL BELIEFS

Location: B: dark-brown, East Wing Building, room 124

Group B – Session Chair: Markku S. **Hannula**

Presentations: João Luiz **Muzinatti***

(UNESP Rio Claro)

THE "LAST MAN" AND MATHEMATIC EDUCATION

Graham **Rankin***
(Kwantlen Polytechnic University)
A MOTIVATIONAL THEORY FOR HOMEWORK

Giang-Nguyen Thi **Nguyen*** (1), Barbara **Otto** (2), Byron **Havard** (1), Carla **Thompson** (1)
(1: University of West Florida; 2: Goethe University of Frankfurt)
IMPACT OF TIME SPENT ON HOMEWORK, MOTIVATION, AND PARENTAL INVOLVEMENT ON LOW-ACHIEVING STUDENTS' SUCCESS

Sarah **Beumann***
(Ruhr-Universität Bochum)
MATHEMATICAL EXPERIMENTS AND THEIR IMPACT ON STUDENTS BASIC NEEDS

TSG 29 – Mathematics and creativity

Co-chairs: Dace **Kuma** (Latvia), Demetra **Pitta-Pantazi** (Cyprus)
Team members: Alex **Friedlander** (Israel), Thorsten **Fritzlar** (Germany), Emiliya **Velikova** (Bulgaria)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: B: dark-brown, East Wing Building, room 232

Session Chairs: Emiliya **Velikova**, Dace **Kuma**
Presentations: Hamlet S. **Mikaelian***
(Kh.Abovyan Armenian State Pedagogical University)
BEAUTY AND THE EDUCATIONAL POTENTIAL OF MATHEMATICS

Noriko **Tanaka***
(Toyota-nishi High School)
MAKING PROBLEM-ASKING THE STUDENTS TO MAKE UP PROBLEM

Dündar **Sefa** (1), Mehmet **Bulut*** (2)
(1: Abant İzzet Baysal University; 2: Gazi University)
INVESTIGATION OF PRESERVICE TEACHERS' BRAIN WAVES DURING SOLUTION PROCESS OF CREATIVE SPATIAL PROBLEMS

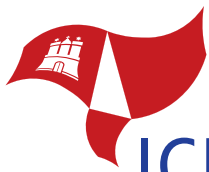
Young-Han **Choe***
(Korean Society of Mathematical Education)
SOUTH KOREA'S EDUCATION SYSTEM DESTROYS STUDENTS' MATHEMATICAL CREATIVITY

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: B: dark-brown, East Wing Building, room 232

Session Chairs: Alex **Friedlander**, Torsten **Fritzlar**
Presentations: Bruce Stuart **Ferrington***
(Radford College)
IF WE'VE ALL GOT THE SAME ANSWER, WE MUST BE ASKING THE WRONG QUESTION

Daud **Mamiy***, Saida **Mamiy**
(Adyghe State University)
MATHEMATICAL CIRCLE AS START-UP IN MATHEMATICS





Tereza **Bártlová***
(Charles University in Prague)
LEARNING MATHEMATICS IN AN AMUSING WAY

Oscar Joao **Abdounur***
(University of Sao Paulo)
RATIOS AND MUSIC STRUCTURAL PROBLEMS IN HISTORY:
A HEURISTIC / ANALOGIC / EDUCATIONAL APPROACH

Santi **Vilches***, Maite **Gorritz**
(INS Arquitecte Manuel Raspall)
LEARNING USING YOUR OWN CREATIVE PROCESS

TSG 31 – Language and communication in mathematics education

Co-chairs: Judit **Moschkovich** (USA), David **Wagner** (Canada)
Team members: Arindam **Bose** (South Africa), Jackeline Rodrigues **Mendes** (Brazil),
Marcus **Schütte** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: H: orange, Educational Building, room 08

Session Chair: Arindam **Bose**
Presentations: Ana Carolina **Faustino***
(State University of São Paulo – Unesp – Rio Claro)
SWEIV DLROW : DIALOGUE AS METTING OF DIFFERENT WORLD VIEWS

Marei **Fetzer** (1), Kerstin **Tiedemann*** (2)
(1: Goethe-University of Frankfurt; 2: University of Cologne)
THE INTERPLAY OF LANGUAGE AND OBJECTS IN THE PROCESS OF ABSTRACTING

Ruilin **Wang** (1), Jingbin **Zhang*** (1), YiQiao **Zhang** (2)
(1: Capital Normal University; 2: Beijing No. 55 Middle School)
ON OPERATION AND FUNCTION OF MATHEMATICS JOURNAL IN JUNIOR HIGH SCHOOL

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: H: orange, Educational Building, room 08

Group A – Session Chair: Marcus **Schütte**
Presentations: Rachael **Kenney***, Jennifer **Richardson**
(Purdue University)
HELPING TEACHERS UNPACK THE ACADEMIC LANGUAGE OF MATHEMATICS

Sedef **Celik***
(Artvin Çoruh University)
HOW PROSPECTIVE MATHEMATICS TEACHERS ARE USING MATHEMATICAL
LANGUAGE IN THE CLASSROOM?

Da **Liu***
(Teaching Research Section of Shanghai Municipal Education Commission)
SOME SUGGESTIONS FOR CULTIVATING STUDENTS' MATHEMATICAL
LANGUAGE COMMUNICATION AND EXPRESSION ABILITY

Annika Meike **Wille***

(Alpen-Adria-Universität Klagenfurt)

DEVELOPING MATHEMATICAL LANGUAGE PROFICIENCY IN PRESERVICE
TEACHER EDUCATION: A CASE STUDY

Rune **Herheim***, Toril Eskeland **Rangnes**

(Bergen University College)

STUDENTS' ARGUMENTATION FOR WORKING WITH A RISK ISSUE IN MATHEMATICS

Location: H: orange, Educational Building, room 404

Group B – Session Chair: Jackeline Rodrigues **Mendes**

Presentations: Lorena **Trejo***, Marta **Valdemoros**

(Center of Research and Advanced Studies of the Institute Polytechnics Institute National)
THE DIVISION IN ELEMENTARY SCHOOL: THE CASE OF TEACHER KARINA

David Allen **Thomas** (1), Gerrit Hendrikus **Stols*** (2)

(1: University of Great Falls; 2: University of Pretoria)

MATH TALK: ANALYZING THE TIMSS VIDEO TRANSCRIPTS

Máire Ní **Ríordáin***, Aisling **McCluskey**

(NUI Galway)

A COMPARISON OF IRISH AND ENGLISH LANGUAGE LEARNING DISCOURSES
IN MATHEMATICS

Zhou **Chang jun***

(Dehong teachers' college)

CASE STUDY ON MATHEMATICAL COMMUNICATION FOR ETHNIC MINORITY
STUDENT IN GRADE 8 DEHONG PREFECTURE SOUTH-WEST CHINA

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, lecture hall C

Group A – Session Chair: Richard **Barwell**, Anjum **Halai** (Joint Session with TSG 32)

Panel discussion: Intersections and differences in work on language in monolingual and
multilingual/multicultural classrooms and settings

Panelists: Richard **Barwell**, Anjum **Halai**, Arindam **Bose**, Jacqueline **Rodrigues**, Marcus **Schütte**

Location: I: blue, Philosophical Tower, lecture hall G

Group B – Session Chair: Judit **Moschkovich**, David **Wagner** (Joint Session with TSG 32)

Panel discussion: Intersections and differences in work on language in monolingual and
multilingual/multicultural classrooms and settings

Panelists: Judit **Moschkovich**, David **Wagner**, Aldo Parra, Lena **Wessel**

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 08

Session Chair: Judit **Moschkovich**

Presentations: Christine **Bescherer**, Pelagia **Papadopoulou***

(University of Education)

PODCASTS IN SECOND LANGUAGE MATH TEACHING AS AN INSTRUMENT
FOR MEASURING TEACHERS' LANGUAGE AWARENESS





M. Alejandra **Sorto*** (1), Aaron T. **Wilson** (2), Alexander **White** (1)
(1: Texas State University; 2: The University of Texas Rio Grande Valley)
TEACHER KNOWLEDGE AND TEACHING PRACTICES IN LINGUISTICALLY DIVERSE CLASSROOMS

Carina **Zindel***
(TU Dortmund)
LANGUAGE LEARNERS DEALING WITH FUNCTION WORD PROBLEMS: RELATING LINGUISTIC MEANS AND THE SYMBOLIC SIGN SYSTEM

Faith Lindiwe **Tshabalala***
(Gauteng Department of Education)
EXPLORING HOW A GRADE 7 TEACHER PROMOTES MATHEMATICAL REASONING IN MULTILINGUAL MATHEMATICS CLASS

Sasha **Wang***
(Boise State University)
A DISCOURSE APPROACH TO GEOMETRIC THINKING

TSG 32 – Mathematics education in a multilingual and multicultural environment

Co-chairs: Richard **Barwell** (Canada), Anjum **Halai** (Pakistan)
Team members: Guida **de Abreu** (UK), Aldo **Parra** (Colombia), Lena **Wessel** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: I: blue, Philosophical Tower, room 263

Session Chair: Aldo **Parra**
Presentations: Rebecca **Klose***
(Justus-Liebig-Universität Gießen)
COMMUNICATING MATHEMATICALLY IN BILINGUAL SETTINGS

Fatima **Assaf***
(University of Ottawa)
**“MATH IS ONLY IN ENGLISH, IT’S PROHIBITED IN ARABIC”:
HOW ENGLISH SHAPES THE MATHEMATICAL PRACTICES OF A CLASSROOM**

Jose **Martinez-Hinestroza***
(Michigan State University)
**SUPPORTING BILINGUAL MATHEMATICAL DISCUSSIONS:
INSTRUCTIONAL STRATEGIES**

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: I: blue, Philosophical Tower, room 263

Session Chairs: Anjum **Halai**, Richard **Barwell**
Presentations: Anita **Bright*** (1), G. Sue **Kasun** (2)
(1: Portland State University; 2: Utah State University)
NEW WAYS OF KNOWING: BILINGUAL TEACHER CANDIDATES’ SHIFTING SENSE OF SELF IN MATHEMATICS

Sarah A. **Roberts***

(University of California Santa Barbara)

THE ROLE OF VIDEO IN MATHEMATICS PROFESSIONAL LEARNING FOR
EXPLORING SUPPORTING MULTILINGUAL LEARNERS

Ryoon-Jin **Song*** (1), Mi-Kyung **Ju** (2)

(1: University of Wisconsin Madison; 2: Hanyang University)

AN ANALYSIS OF KOREAN MATHEMATICS TEACHERS' BELIEFS IN MATHEMATICS
AS A SCHOOL SUBJECT AND ITS TEACHING

Ji **Yeong I.*** (1), Zandra **de Araujo** (2)

(1: Iowa State University; 2: University of Missouri)

CONNECTING MATH AND CULTURE TO TEACH ELS

Benedetto **Di Paola** (1), Giovanni Giuseppe **Nicosia*** (2)

(1: Dipartimento di Matematica e Informatica; 2: I.I.S. Aldini Valeriani Sirani)

CULTURE AS RESOURCE OR OBSTACLE FOR TEACHER? THE CASE OF CHINESE
STUDENTS IN ITALIAN CLASSROOM

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, lecture hall C

Group A – Session Chairs: Richard **Barwell**, Anjum **Halai** (Joint Session with TSG 31)

Panel discussion: Intersections and differences in work on language in monolingual and
multilingual/multicultural classrooms and settings

Panelists: Richard **Barwell**, Anjum **Halai**, Arindam **Bose**, Jacqueline **Rodrigues**, Marcus **Schütte**

Location: I: blue, Philosophical Tower, lecture hall G

Group B – Session Chairs: Judit **Moschkovich**, David **Wagner** (Joint Session with TSG 31)

Panel discussion: Intersections and differences in work on language in monolingual and
multilingual/multicultural classrooms and settings

Panelists: Judit **Moschkovich**, David **Wagner**, Aldo Parra, Lena **Wessel**

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: I: blue, Philosophical Tower, room 263

Session Chair: Lena **Wessel**

Presentations: Zhang Heping* (1), Song **Naiqing** (1), Zhang **Nan** (2)

(1: Southwest University; 2: Tianjin Normal University)

CULTURAL CONFLICT AND REGRESSION OF EDUCATION:
THOUGHTS ON THE MATHEMATICS EDUCATION FOR ETHNIC MINORITIES IN CHINA

Weizhong **Zhang***, Qingkuo **Sun**

(Zhejiang Normal University)

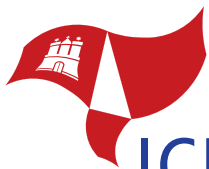
A COMPARATIVE STUDY ON CHINA'S MATHEMATICS TEXTBOOKS FOR
JUNIOR HIGH SCHOOL FROM A MULTICULTURAL PERSPECTIVE

Peter Aaron Mayengo **Kajoro***

(The Aga Khan University)

LANGUAGE AND MATHEMATICS TEXTBOOKS IN TANZANIA'S MULTILINGUAL
EDUCATIONAL CONTEXT





Jing **Wang***, Aoxue **Su**, Wei **He**, Xujie **Jia**, Fang **Liang**
(Minzu University)

A SURVEY RESEARCH ON MATH ACHIEVEMENTS OF TIBET STUDENT
IN THE FIFTH GRADE

Lindiwe **Tshuma*** (1,2)

(1: African Institute for Mathematical Sciences Schools Enrichment Centre; 2: Stellenbosch University)
RELATIONSHIP BETWEEN LANGUAGE COMPETENCY AND INTERMEDIATE PHASE
MATHEMATICS INSTRUCTION: A CASE OF THE EASTERN CAPE

TSG 33 – Equity in mathematics education (including gender)

Co-chairs: Bill **Atweh** (Philippines), Joanne **Rossi Becker** (USA)

Team members: Barbro **Grevholm** (Norway), Gelsa **Knijnik** (Brazil), Laura **Martignon** (Germany),
Jayasree **Subramanian** (India)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 11

Session Chair: Joanne **Rossi Becker**

Presentations: Sally-Ann **Robertson***

(South African Numeracy Chair Project)

TEACHER'S QUESTIONING PRACTICES AND ISSUES OF LEARNER AGENCY
IN MATHEMATICS CLASSROOMS

Guilherme Henrique **Gomes da Silva*** (1,2)

(1: Sao Paulo State University; 2: Federal University of Alfenas)

EQUITY IN THE HIGHER EDUCATION: THE ROLE OF MATHEMATICS EDUCATION
FACED WITH AFFIRMATIVE ACTIONS

Chang-Hua **Chen***, Chia-Hui **Lin**

(National Academy for Educational Research)

DEVELOPING DIFFERENTIATED INSTRUCTION TO CLOSE LEARNING ACHIEVEMENT
GAP IN MATHEMATICS

Niamh **O'Meara*** (1), Mark **Prendergast** (2)

(1: EPI*STEM, University of Limerick; 2: Trinity College Dublin)

AN INVESTIGATION INTO THE INEQUITY SURROUNDING MATHEMATICS INSTRUCTION TIME

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: K: purple, Law Building, room 11

Session Chair: Gelsa **Knijnik**

Presentations: Rosie Lopez **Conde***

(Caraga State University-Butuan City)

PRE-SERVICE TEACHERS' PRAXEOLOGY IN TEACHING MATHEMATICS FOR
SOCIAL JUSTICE AND EQUITY

Lena **Lindenskov** (1), Steffen **Overgaard** (2), Pia **Tonnesen*** (2), Peter **Weng** (2)
(1: Danish School of Education; 2: Metropolitan University College)

RESEARCH ON EARLY INTERVENTION PROGRAMS IN DENMARK AS A MEANS TO EQUITY

Jennifer Marie **Langer-Osuna***, Jennifer **Munson**
(Stanford University)

SUPPORTING ELEMENTARY TEACHERS' CAPACITY TO FOSTER EQUITABLE AND
PRODUCTIVE MATHEMATICS CLASSROOMS

Alice LaRue Joy **Cook***
(University of Maryland)

IMPLEMENTATION OF SOCIAL JUSTICE MATHEMATICS: EXPERIENCES & PERCEPTIONS
OF SECONDARY MATH TEACHERS

TSG 34 – Social and political dimensions of mathematics education

Co-chairs: Murad **Jurdak** (Lebanon), Renuka **Vithal** (South Africa)

Team members: Peter **Gates** (UK), Elizabeth **de Freitas** (USA), David **Kollosche** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: D: yellow, West Wing Building, room 121

Session Chair: Renuka **Vithal**

Presentations: Suela **Kacerja***
(Bergen University College)

(MORE) REASONS FOR TEACHING (CRITICAL) MATHEMATICS USED IN DIFFERENT
REAL-LIFE SITUATIONS

Reinhard **Hochmuth**, Johanna **Ruge***
(Leibniz University Hannover)

THE RECONSTRUCTION OF MATHEMATICAL PRACTICES IN SIGNAL THEORY:
REMARKS CONCERNING LOGOS BLOCKS AND RECOGNITION RULES

Takashi **Nakanishi***
(Hiroshima University)

REVISITING OF DEMOCRATIC COMPETENCE THROUGH MATHEMATICS EDUCATION:
FOCUSING ON INTERNATIONAL TRENDS OF CRITICAL THINKING

Tania **Andrade***, Pamela **Montero**
(Universidad Diego Portales)

MATHEMATICS CURRICULUM DESIGN FROM THE PERSPECTIVE OF CITIZENSHIP
A CRITICAL DISCOURSE ANALYSIS





TSG 35 – Role of ethnomathematics in mathematics education

Co-chairs: Milton **Rosa** (Brazil), Lawrence **Shirley** (USA)

Team members: Willy V. **Alangui** (Philippines), Maria Elena **Gavarrete** (Costa Rica)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: H: orange, Educational Building, room 205

Group A – Session Chair: Milton **Rosa**

Presentations: Hongshick **Jang***

(Songea Girls Secondary School)

LANGUAGE, ETHNOMATHEMATICS AND TECHNOLOGY IN MATHEMATICS
EDUCATION CHALLENGES AND PITFALLS – THE CASE OF TANZANIA

Toyanath **Sharma***

(Kathmandu University)

MEANINGFUL MATHEMATICS THROUGH CULTURAL ARTIFACTS

Alexandrina **Monteiro***, Jackeline Rodrigues **Mendes**

(UNICAMP)

KNOWLEDGE MOBILIZATION IN CULTURAL PRACTICES: ETHNOMATHEMATICS
AS A CONTEUR-CONDUCT MOVEMENT

Location: H: orange, Educational Building, room 206

Group B – Session Chair: Maria Elena **Gavarrete**

Presentations: Kay **Owens***

(Charles Sturt University)

THE ROLE OF CULTURE AND ECOLOGY IN VISUOSPATIAL REASONING:
THE POWER OF ETHNOMATHEMATICS

Franco **Favilli*** (1), Fiorenza **Turiano** (2)

(1: Università di Pisa; 2: Liceo Arimondi)

ON WHICH FINGER WILL THE NUMBER FALL?

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 07

Session Chair: Wilfredo **Alangui**

Presentations: José Ricardo **Mafra*** (1), Maria Cecilia **Fantinato** (2)

(1: Universidade Federal do Oeste do Pará; 2: Universidade Federal Fluminense)

PERCEIVED TECHNIQUES AND PROCESSES OF CRAFTSWOMEN'S WORK
IN SANTARÉM / PA

María **del Carmen Bonilla***

(Apinema: Asociación Peruana de Investigación en Educación Matemática)

TOOLS OF HISTORY OF MATHEMATICS AND DYNAMIC GEOMETRY IN THE
PRE-SERVICE TRAINING IN INTERCULTURAL BILINGUAL EDUCATION

Ramesh **Neupane***

(Kathmandu University School of Education)

TEACHING AND LEARNING MATHEMATICS IN A CULTURAL CONTEXT:
PING AS A PROJECT

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: H: orange, Educational Building, room 205

Session Chair: Daniel Clark **Orey**

Presentations: Sudhakar **Agarkar***

(Vidya Prasarak Mandal)

UNDERSTANDING THE UNITS OF LENGTH MEASUREMENT USED BY
TRIBAL PEOPLE IN INDIA

André **Gerstberger***, Leda Maria **Giongo**

(Centro Universitário UNIVATES)

ETHNOMATEMATICS LOOK AT MOBILE USAGE REGARDING TEACHING
MATHEMATICS PROCESSES IN ELEMENTARY EDUCATION FINAL YEARS

TSG 36 – Task design, analysis and learning environments

Co-chairs: Jiansheng **Bao** (China), Jere **Confrey** (USA)

Team members: Jonei **Barbosa** (Brazil), Helmut **Linneweber-Lammerskitten** (Switzerland),
Anne **Watson** (UK)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 2175/2181

Session Chair: Ann **Watson**

Presentations: Teo **Paoletti*** (1), Kevin C. **Moore** (2), Irma E. **Stevens** (2)

(1: Montclair State University; 2: University of Georgia)

TASK-DESIGN PRINCIPLES FOR COVARIATIONAL REASONING

Alik **Palatnik*** (1,2)

(1: The Technion; 2: UC Berkeley)

TOWARDS A TYPOLOGY OF STUDENTS' MATHEMATICAL RESEARCH PROJECTS

Ida Ah Chee **Mok***

(The University of Hong Kong)

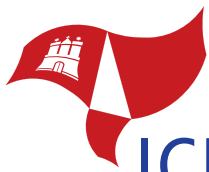
EXPERIENCING MEANINGFUL SCHOOL MATHEMATICS: RICH TASKS FOR INEQUALITY

Leslie **Dietiker***, Aaron **Brakoniecki**, Elyssa R. **Miller**, Andrew S. **Richman**

(Boston University)

ENACTED TASK DESIGN: TASKS AS WRITTEN IN THE CLASSROOM





Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 2175/2181

Session Chair: Ann **Watson**

Presentations: Xiang **Gao***, Bo **Zhang**
(Yangzhou University)

A COMPARISON OF NOVICE AND EXPERIENCED TEACHERS' DESIGN
OF A QUESTION SEQUENCE

Marc **Schäfer*** (1), Helmut **Linneweber-Lammerskitten** (2)

(1: Rhodes University; 2: University of Applied Sciences Northwest Switzerland)

ENHANCING MATHEMATICAL CURIOSITY THROUGH VITALMATHS VIDEO CLIP TASKS

Arthur Man Sang **Lee***

(The University of Hong Kong)

DEVELOPING COLLABORATIVE RICH TASKS WITH TEACHERS IN
HONG KONG CLASSROOMS

Phei Ling **Tan*** (1), Liew Kee **Kor** (2), Prof. Dr. Chap Sam **Lim** (3)

(1: Universiti Sains Malaysia; 2: Universiti Teknologi MARA Malaysia; 3: Universiti Sains Malaysia;
3: Universiti Sains Malaysia)

APPLYING ATTRIBUTE HIERARCHY METHOD IN TASK DESIGN AND ITEM ANALYSIS
FOR THE TOPIC "TIME" IN PRIMARY MATHEMATICS

Choosak **Udinkaew***, Jensamut **Saengpun**

(Chiang Mai University)

DESIGNING MATHEMATICAL TASKS FOR DEVELOPING MATHEMATICAL
THINKING IN CLASSROOM TAUGHT THROUGH OPEN APPROACH

Charles E. **Wilkes II***

(University of Michigan)

SOPHISTICATED MATHEMATICS: WHAT DOES IT LOOK LIKE FOR FIFTH GRADERS

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 2175/2181

Session Chair: Jere **Confrey**

Presentations: Susan Kathleen **Forsythe***
(University of Leicester)

ANALYSIS OF STUDENTS' WORK WITH A DYNAMIC FIGURE THROUGH
THE LENS OF DUVAL

Shai **Olsher***, Beba **Shternberg**, Michal **Yerushalmy**

(University of Haifa)

GUESS WHO: ADDRESSING MEANINGFUL CHARACTERISTICS AS MEANS TO
DISCOVER WHICH IS THE CHOSEN DYNAMIC FIGURE

Ilya Aleksandrovich **Posov*** (1,2), Dmitry Irikovich **Mantserov** (3)

(1: Saint Petersburg State University; 2: Saint Petersburg State Electrotechnical University "LETI";
3: Limited Liability Company "Profit")

USING FREE SOFTWARE TO IMPLEMENT VERIFICATION PROBLEMS WITH PARAMETERS

Joerg **Zender***, Matthias **Ludwig**
(Goethe-Universität Frankfurt am Main)
MATHCITYMAP (MCM): FROM PAPER TO SMARTPHONE –
A NEW APPROACH OF AN OLD CONCEPT

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: E: mint, Economical Building, room 2175/2181

Session Chair: Helmut **Linneweber-Lammerskitten**
Presentations: Sepideh **Noruzi*** (1), Mahmoud **Mehrmohammadi** (2)
(1: Tarbiat Modares University; 2: Tarbiat Modares University)
TECHING MATHEMATICS THROUGH DIFFERENT GENRES OF STORIES

Heather Lynn **Johnson***
(University of Colorado Denver)
DESIGNING TECHNOLOGY-RICH TASKS TO FOSTER SECONDARY STUDENTS'
COVARIATIONAL REASONING

Antti **Rasila*** (1), Christopher J. **Sangwin** (2)
(1: Aalto University; 2: The University of Edinburgh)
DEVELOPMENT OF STACK ASSESSMENTS TO UNDERPIN MASTERY LEARNING

Marie **Joubert***, Ingrid **Mostert**
(African Institute of Mathematical Sciences)
USING 'LEARNING EXPERIENCES' IN SOUTH AFRICAN CLASSROOMS:
IMPLICATIONS FOR A TEACHER TOOLKIT

Bibhya **Sharma***, Bijeta **Kumar**, Akeshnil **Bali**
(University of the South Pacific)
ONLINE MATHEMATICS DIAGNOSTIC TEST AND REMEDIATION FOR
NEW ENTRANTS IN HIGHER EDUCATION IN THE PACIFIC REGION

TSG 37 – Mathematics curriculum development

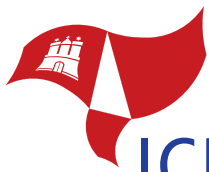
Co-chairs: Anita **Rampal** (India), Zalman **Usiskin** (USA)
Team members: Andreas **Büchter** (Germany), Iman **Osta** (Lebanon), Jeremy **Hodgen** (UK)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: K: purple, Law Building, room 14

Session Chair: Zalman **Usiskin**
Presentations: Kazuko Ito **West*** (1, 2)
(1: Institute of Teacher Education; 2: Keio Academy of New York)
JAPAN'S TEN YEAR EXPERIMENT: FROM 1998 THROUGH 2008

Shihu **Lv**, Chunyan **Cao**, Zhenying **Wu***
(Northwest Normal University)
IMPLEMENTATION STATUS OF THE NEW MATHEMATICS CURRICULUM FOR
SENIOR HIGH SCHOOL IN MAINLAND CHINA





Susan **Hough***, Yvette **Solomon**, Paul **Dickinson**, Stephen **Gough**

(Manchester Metropolitan University)

COUNTERACTING FAILURE – USING A REALISTIC MATHEMATICS EDUCATION APPROACH WITH EXAMINATION RETAKE STUDENTS

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 14

Session Chair: Andreas **Büchter**

Presentations: Jefferson **Biajone*** (1), Elisabeth **Barolli** (2)

(1: Itapetininga College of Technology; 2: State University of Campinas)
THE DISCRETE MATHEMATICS CURRICULUM PRODUCTION TRAJECTORY IN A SYSTEM ANALYSIS AND DEVELOPMENT COURSE

Gina Patricia **Paz Huamán***

(Sistema Nacional de Evaluación)

THE MAPS PROGRESS IN THE NEW MATH CURRICULUM PERU

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: K: purple, Law Building, room 14

Session Chair: Anita **Rampal**

Presentations: Avital **Elbaum-Cohen***

(Weizmann Institute of Science)

READING MATHEMATICAL TEXTS IN HIGH-SCHOOL – WORK IN PROGRESS

Evelyn **Süss-Stepancik** (1), Stefan **Götz*** (2)

(1: Pädagogische Hochschule für Niederösterreich; 2: Universität Wien)

SCHOOL MATHEMATICS AND MATHEMATICAL TRAINING: TWO HOTSPOTS IN THE CURRICULUM DEVELOPMENT FOR TEACHER EDUCATION

Elizabeth **Kimber***, Anna **Baker**, Paul **Brown**, Julian **Gilbey**

(Faculty of Mathematics)

THE CAMBRIDGE MATHEMATICS EDUCATION PROJECT: CURRICULUM RESOURCES FOR POST-16 MATHEMATICS

TSG 38 – Research on resources (textbooks, learning materials etc.)

Co-chairs: Lianghuo **Fan** (UK), Luc **Trouche** (France)

Team members: Chunxia **Qi** (China), Sebastian **Rezat** (Germany), Jana **Visnovska** (Australia)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 260

Group A – Session Chair: Chunxia **Qi**

Presentations: Mario Sánchez **Aguilar***, Apolo **Castañeda**

(National Polytechnic Institute)

AN ANALYSIS OF REPRESENTATIONS OF MATHEMATICIANS IN MEXICAN MATHEMATICS TEXTBOOKS

Soo-Yong **Jeong*** (1), Mi-Kyung **Ju** (1), Young Serk **Park** (2)

(1: Hanyang University; 2: Gyungin National University of Education)

AN ANALYSIS ON THE BRIDGEABILITY OF KOREAN MATHEMATICS TEXTBOOKS
FOCUSING ON THE TASKS OF STATISTICS

Kukhwan **Oh*** (1), Jung Sook **Park** (2), Oh Nam **Kwon** (3)

(1: Graduate school of Seoul National University; 2: Yang Jae High School; 3: Seoul National University)

ANALYSIS ON RELATION AMONG DEFINITION OF IRRATIONAL NUMBERS,
REPRESENTATIONS AND EXAMPLES

Location: I: blue, Philosophical Tower, room 256/58

Group B – Session Chair: Luc **Trouche**

Presentations: Hans-Dieter **Janetzko***

(HTWG Konstanz)

CATO 2.0: A GENERAL MULTI-LINGUAL USER INTERFACE FOR CAS –
UNE INTERFACE UTILISATEUR MULTILINGUE

Anshan **Pu***

(Yangzhou University)

COMPARISON ABOUT DIFFICULTY OF EXAMPLES OF PLANE VECTOR BETWEEN
THE PEP (A) VERSION AND THE IBDP VERSION

Angelina Matinde **Bijura***

(Aga Khan University)

MOBILE MATHEMATICS LEARNING MATERIALS FOR SUB SAHARAN AFRICA

Location: I: blue, Philosophical Tower, lecture hall D

Group C – Session Chair: Jana **Visnovska**

Presentations: Franck **Bellemain** (1), Juliana Andrade **Araripe** (2),

Rosilângela Lucena Scanoni **Couto*** (3), Pedro Alessio **Martins** (4), Rogério **Da Silva Ignácio** (5)

(1: Federal University of Pernambuco; 2: Federal University of Pernambuco;

3: Federal University of Pernambuco; 4: Federal University of Pernambuco;

5: CAP-UFPE and Universidade Anhanguera de São Paulo)

FROM TEXTBOOK TO LIVED RESOURCES: THE DIGITAL GUIDE OF THE
BRAZILIAN EVALUATION PROGRAM OF SCHOOL TEXTBOOK

Romina Ann Soon **Yap***, Yew Hoong **Leong**

(National Institute of Education)

CONCRETISED MATHEMATICS TEACHING RESOURCES

Rosilângela **Lucena*** (1), Verônica **Gitirana** (2)

(1: Universidade Federal de Pernambuco-UFPE; 2: Universidade Federal de Pernambuco-UFPE)

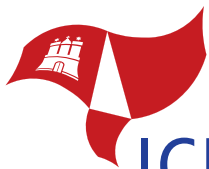
IN-SERVICE REFLEXIVE TEACHER TRAINING: REQUERIMENTS FOR AN ENVIRONMENT
WITH PUBLISHING CHAINS

Roberto Mariano Araújo **Filho*** (1), Verônica **Gitirana** (1), Celso **Gonçalves** (2)

(1: Universidade Federal de Pernambuco – UFPE; 2: Centro Universitário do Triângulo – UNITRI)

COLLABORATION IN TEACHER INITIAL TRAINING: ANALYSIS OF CONSTRAINTS





Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: I: blue, Philosophical Tower, room 260

Group A – Session Chair: Lianghuo **Fan**

Presentations: Erhan **Bingolbali***, Ferhan **Bingolbali**, Ayse Elcin **Summak**
(Gaziantep University)

CURRICULUM, TEXTBOOK AND PROBLEM SOLVING

Elsa Pascual **Santaolalla***, Belén M. Urosa **Sanz**

(Universidad Pontificia Comillas)

PROBLEM SOLVING IN PRIMARY EDUCATION MATHEMATICAL TEXTBOOKS IN SPAIN

Sebastian **Walter***

(University of Augsburg)

MATH ADVENTURE – A PRAGMATIC APPROACH TO RESEARCH IN SUPPORT
OF INCLUSION IN PRIMARY MATHEMATICAL EDUCATION

Carlos Alberto **Fuentes***, Bidart **Gastón**, Cabral **Gastón**, Cafure **Antonio**

(Universidad Nacional de General Sarmiento)

RATIONALIZING DENOMINATORS AND THE NOTION OF CONJUGATE.
THE ROLE OF TEXTBOOKS IN SPREADING WRONG MATHEMATICAL IDEAS

Location: I: blue, Philosophical Tower, room 256/58

Group B – Session Chair: Sebastian **Rezat**

Presentations: Xiaomei **Liu*** (1), Ruilin **Wang** (1), Huiying **Zhang** (2)

(1: Capital Normal University; 2: Shijiazhuang Education Institute)

A COMPARATIVE STUDY OF ILLUSTRATIONS IN THE OLD AND
NEW MIDDLE SCHOOL MATH TEXTBOOKS

Peter **Pausigere***

(South African Numeracy Chair)

EXPLORING THE TYPES OF IMAGES AND REPRESENTATIONS USED IN
THE SOUTH AFRICAN GRADE 4 NUMERACY WORKBOOKS

Velayutham **Sarveswary***, Lim Chap **Sam**

(University of Science Malaysia)

THE IDEATIONAL MEANING OF IMAGES ON WORKED EXAMPLES IN
MALAYSIAN AND SINGAPOREAN MATHEMATICS TEXTBOOKS

Rute Elizabete **Borba*** (1), Juliana **Azevedo** (1), Marilena **Bittar** (2)

(1: Universidade Federal de Pernambuco; 2: Universidade Federal do Mato Grosso do Sul)

BRAZILIAN PRIMARY SCHOOL TEXTBOOKS: SYMBOLIC REPRESENTATIONS IN
COMBINATORIAL SITUATIONS

Viviana Carolina **Llanos***, Maria Rita **Otero**

(UNCPBA – CONICET)

THE MATHEMATICS TEXTBOOKS IN THE ARGENTINE SECONDARY SCHOOL:
IMAGES AND ARGUING

Gracin Dubravka **Glasnovic ***

(Faculty of Teacher Education)

REPRESENTATION, COMPUTATION, INTERPRETATION, ARGUMENTATION:
RESEARCH ON MATHEMATICAL ACTIVITIES IN MATHEMATICS TEXTBOOKS

Oral Communications

OC

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 260

Group A – Session Chair: Sebastian **Rezat**

Presentations: Natividad **Adamuz-Povedano***, Alexander **Maz-Machado**, Rafael **Bracho-López**
(University of Córdoba)

THEMATIC RESEARCH TRENDS IN MATHEMATICS EDUCATION PUBLISHED
IN BOOKS FROM 1990 TO 2012

Xujie **Jia***, Wei **He**, Xiaotian **Sun**, Shu **Zhang**

(Minzu University of China)

PROBLEMS AND SUGGESTIONS IN DEVELOPING BILINGUAL TEXTBOOKS
OF SCIENCES IN ETHNIC REGIONS OF CHINA

Xiaoli **Yang***

(Beijing Institute of Education)

ON HOW TO HELP STUDENTS BETTER UNDERSTAND FUNCTION CONCEPT
THROUGH COMPARISON OF DIFFERENT MATH TEXTBOOKS

Lingyun **Zhao***, Zhihui **Chen**

(East China Normal University)

A COMPARATIVE STUDY OF JUNIOR MIDDLE SCHOOL MATHEMATICAL EXERCISES'
COGNITIVE DIFFICULTY BETWEEN SHANGHAI AND TAIWAN

Location: I: blue, Philosophical Tower, room 256/58

Group B – Session Chair: Luc **Trouche**

Presentations: Marilena **Bittar** (1), Veronica **Gitirana*** (2)

(1: Universidade Federal de Mato Grosso do Sul; 2: Universidade Federal de Pernambuco)

MATHEMATICS LITERACY BRAZILIAN TEXTBOOKS (PNLD):
A STUDY OF DISTRIBUTION OF SCHOOL MATHEMATIC CONTENT FIELDS

Sofia **Hatziminadakis**, Irem **Ercan***

(University of South Florida)

ANALYSIS OF THE LEVELS OF MATHEMATICAL COMPLEXITY OF GEOMETRICAL
TASKS IN 8TH GRADE AMERICAN, TURKISH AND GREEK TEXTBOOKS

Eloisa **Benitez***, J. Rigoberto **Gabriel**

(Universidad Veracruzana)

SOME TEXTS' ANALYSIS TO FIND CHARACTERISTICS OF REAL NUMBERS

Xiayan **Shao***, Bao **Jiansheng**

(East China Normal University)

COMPARISON OF THE CONCEPT OF PROBABILITY IN HIGH SCHOOL TEXTBOOKS
AMONG CHINA, AMERICA AND SINGAPORE

Location: I: blue, Philosophical Tower, lecture hall D

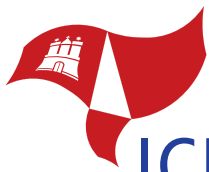
Group C – Session Chair: Lianghuo **Fan**

Presentations: Zhe **Zhu***, Wei-zhong **Zhang**

(Zhejiang Normal University)

COMPARISON ON PYTHAGORAS THEOREM IN MATHEMATICS TEXTBOOKS
OF THREE COUNTRIES





Cibelle Castro **Assis*** (1), Rosilângela **Lucena** (2)
(1: UFPB; 2: UFPE)

A MATH TEACHER'S RESOURCES IN THE COLLECTIVE PERSPECTIVE OF
THE DOCUMENTAL WORK

Miguel **Ribeiro*** (2), Rúbia **Amaral** (1), Juliana **Godoy** (1)
(1: UNESP – São Paulo State University; 2: University of Algarve)

THE ANGLE SYMBOLS IN SOME TEXTBOOKS OF MATHEMATICS

Mary Ann **Huntley*** (1), Maria Shea **Terrell** (1), Nicole **Fonger** (2)
(1: Cornell University; 2: University of Wisconsin-Madison)

THE ALGEBRA CONTENT OF HIGH-SCHOOL TEXTBOOKS IN THE US

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: I: blue, Philosophical Tower, room 260

Group A – Session Chair: Chunxia **Qi**

Presentations: Qi **Chunxia*** (1), Wang **Ruilin** (2), Lin **Mengwei** (1), Jing **Chen** (3)
(1: Beijing Normal University; 2: Capital Normal University; 3: Beijing No. 101 Middle School)

DOES A PROJECT-BASED LEARNING MATERIAL IMPROVE STUDENTS'
UNDERSTANDING OF RATIONAL NUMBER? A CASE STUDY

Arati Sudhir **Bapat*** (1), Shikha **Takker** (2)

(1: Tata Institute of Social Science; 2: Homi Bhabha Centre for Science Education)

ENABLING TEACHERS FOR EFFECTIVE TEACHING-LEARNING IN THE
CONSTRUCTIVIST CURRICULUM FRAMEWORK

Burcu Nur **Bastürk Sahin***, Menekse Seden Tapan **Broutin**
(Uludag University)

ANALYSIS OF PRIMARY MATHEMATICS TEACHERS' LESSON DOCUMENT
PREPARATION PROCESSES

Josip **Slisko***, Lidia Aurora Hernández **Rebollar**, José Antonio Juárez **López**
(Facultad de Ciencias Físico Matemáticas)

DETECTING ERROR IN A MATHEMATICS TEXTBOOK'S DRAWING:
ARE REALLY HELPFUL RELATED PROFESSIONAL EXPERIENCE AND KNOWLEDGE?

Dyana **Wijayanti*** (1), Yoppy Wahyu **Purnomo** (2)
(1: University of Copenhagen; 2: University of Muhammadiyah)

A HISTORICAL STUDY OF HOW PROPORTION IN ARITHMETIC APPEARS IN INDONESIAN
LOWER SECONDARY SCHOOL TEXTBOOKS

Location: I: blue, Philosophical Tower, room 256/58

Group B – Session Chair: Jana **Visnovska**

Presentations: Helen L. **Siedel***, Andreas J. **Stylianides**
(University of Cambridge)

TEACHERS' SELECTION OF RESOURCES IN AN ERA OF PLENTY

Fernando Jorge **Bifano***

(Universidad Nacional Arturo Jauretche)

"LOGBOOKS": A DOCUMENTATIONAL RESOURCE RELEVANT FOR STUDYING
TEACHERS' PROFESSIONAL DEVELOPMENT?

David Alfonso **Páez*** (1), José **Guzmán-Hernández** (2), José **Zambrano-Ayala** (2)
(1: Universidad Autónoma de Aguascalientes; 2: Cinvestav-IPN)

MATHEMATICS TEACHER'S REFLECTION ON THE RESOURCES USED

Liana Faye **Jaber***
(Hebrew University)

**MATHEMATICAL RESOURCES AS PERCEIVED, NEEDED, AND USED BY TEACHERS:
THE CASE OF EAST JERUSALEM TEACHERS**

Linda Marie **Ahl*** (1), Tuula **Koljonen** (2)
(1: Kriminalvården; 2: Malardalen University)

**WHEN TEACHER GUIDES SPEAK "PAST" THE TEACHER:
TWO SWEDISH MATHEMATICS TEACHER GUIDES**

Esra **Yaprak** (1), M. Sencer **Corlu*** (1), Emin **Aydin** (2)
(1: Bilkent University; 2: Marmara University)

**INVESTIGATING THE FOUNDATIONS OF TURKISH ELEMENTARY MATHEMATICS
EDUCATION THROUGH AN ANALYSIS OF A LATE OTTOMAN TEXTBOOK**

TSG 39 – Large scale assessment and testing in mathematics education

Co-chairs: Rae Young **Kim** (Korea), Christine **Suurtamm** (Canada)

Team members: Edward **Silver** (USA), Stefan **Ufer** (Germany), Pauline **Vos** (Norway)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 708

Session Chair: Edward **Silver**

Presentations: Brikena **Djepaxhija***, Pauline **Vos**, Anne Berit **Fuglestad**
(University of Agder)

**THE PISA SCORING GUIDELINES AND THEIR PRESCRIPTIONS FOR INTERPRETING
A PROBLEM SITUATION**

Raymond Brian **Philpot***
(ACER)

DEVELOPING LARGE SCALE ASSESSMENTS: THEORY AND PRACTICE

Hiroko **Kanoh***
(Yamagata University)

**RELATIONSHIP BETWEEN USE OF ICT AND MATHEMATICS ACHIEVEMENT
BASED ON PISA2012**

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

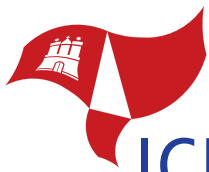
Location: I: blue, Philosophical Tower, room 708

Session Chair: Pauline **Vos**

Presentations: Yongxiao **Bai*** (1), Danting **Huang** (2), Di **Zhang** (3)
(1: Beijing Institute of Education; 2: Beijing No.8 High School; 3: Faculty of Education)

STUDY ON STUDENTS' GEOMETRIC INTUITION AND ITS ASSESSMENT IN GRADE 8





Cigdem **Alagoz***, Celil **Ekici**
(University of the Virgin Islands)

EVIDENCE BASED PLACEMENT INTO DEVELOPMENTAL MATH SEQUENCE AND
A MODEL FOR INDIVIDUALIZED LEARNING PROGRESSION

Sarah **Bansilal***
(UKZN)

THE GRADE 9 NATIONAL ASSESSMENTS IN SOUTH AFRICA: A RASCH ANALYSIS

Páraic Thomas **Treacy***
(University of Derby)

INCENTIVISING HIGHER LEVEL MATHEMATICS STUDY AT UPPER SECONDARY LEVEL:
THE CASE OF BONUS POINTS IN IRELAND.

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 708

Session Chair: Stefan **Ufer**

Presentations: Jana T. **Beitlich**, Matthias C. **Lehner***, Anselm R. **Strohmaier**, Kristina M. **Reiss**
(Technische Universität München)

THE RELATION OF EYE MOVEMENTS ON MATHEMATICAL TASKS AND TASK DIFFICULTY

Zihui **Chen***, Qiongqiong **Liu**, Lingyun **Zhao**, Sisi **Song**, Yinghui **Li**
(East China Normal University)

A COMPARISON STUDY ON PROBLEM SITUATIONS AND CHARACTERISTICS IN
MATHEMATICS ACADEMIC PROFICIENCY TESTS

Radoslav **Dimitric***
(CUNY)

NATURAL TAXONOMY FOR BASIC MATHEMATICAL ABILITY

TSG 40 – Classroom assessment for mathematics learning

Co-chairs: Karin **Brodie** (South Africa), Denisse **Thompson** (USA)

Team members: Leonora Diaz **Moreno** (Chile), Natalie **Sayac** (France), Stanislaw **Schukajlow** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: G: green, Social Science Building, room A316

Session Chairs: Karin **Brodie**, Natalie **Sayac**

Presentations: Megan **Burton*** (1), Edward **Silver** (2), Valerie **Mills** (3), Wanda **Audricht** (4),
Marilyn **Struchens** (1)

(1: Auburn University; 2: University of Michigan; 3: Oakland School District;

4: Independent Consultant)

CONNECTING FORMATIVE ASSESSMENT TO CURRENT EDUCATIONAL
INSTRUCTIONAL STRATEGIES

Gladys Celis **Nivera***

(Philippine Normal University)

DEVELOPING AN ANALYTIC RUBRIC TO ASSESS THE PRODUCTS AND
PROCESSES OF MATHEMATICAL INVESTIGATIONS

Erol **Karakirik** (1), Mustafa **Dogan*** (2), Orhan **Canakci** (3)
(1: Abant Izzet Baysal University; 2: Yildiz Technical University; 3: Marmara University)
A DYNAMIC QUESTION GENERATING SYSTEM FOR MATHEMATICS

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: G: green, Social Science Building, room A316

Session Chairs: Karin **Brodie**, Leonora Diaz **Moreno**
Presentations: David **Wright***, Jill **Clark**, Lucy **Tiplady**
(Newcastle University)
DESIGNING FOR FORMATIVE ASSESSMENT

Annalisa **Cusi*** (1), Francesca **Morselli** (2), Cristina **Sabena** (1)
(1: University of Torino; 2: University of Genova)
THE USE OF DIGITAL TECHNOLOGIES TO ENHANCE FORMATIVE ASSESSMENT PROCESSES

Galit Nagari **Haddif***, Michal **Yerushalmy**
(University of Haifa)
CONSTRUCTION E-TASKS: DESIGN CONSIDERATIONS

Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: G: green, Social Science Building, room A316

Session Chairs: Denisse **Thompson**, Stanislaw **Schukajlow**
Presentations: Julia **Pilet** (1), Julie **Horoks*** (2)
(1: LDAR – UPEC; 2: LDAR – UPEC)
FORMATIVE ASSESSMENT IN TEACHER'S PRACTISE

Philip Sirinides*, Abigail **Gray**, Caroline **Ebby**
(University of Pennsylvania)
INSTRUCTIONAL DECISION MAKING ROOTED IN A LEARNING TRAJECTORY ORIENTATION

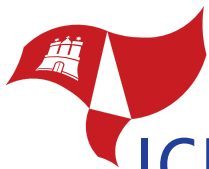
Marty **Tippens***
(Woodbury University)
FORMATIVE ASSESSMENT IN THE MATHEMATICS CLASSROOM THROUGH THE SCAN AND POST TECHNIQUE

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: G: green, Social Science Building, room A316

Session Chairs: Denisse **Thompson**, Leonora **Diaz Moreno**
Presentations: Revathy **Parameswaran***, S. U. **Gopalakrishnan**
(PS Senior Secondary School)
FORMATIVE ASSESSMENTS IN CLASSROOMS IN THE INDIAN CONTEXT

Melise **Camargo***, Kenneth **Ruthven**
(University of Cambridge)
KNOWLEDGE OF FORMATIVE ASSESSMENT: A STUDY WITH MATHEMATICS TEACHERS IN THE FEDERAL DISTRICT OF BRAZIL





Melissa Valeska **Andrade-Molina*** (1), Leonora **Díaz Moreno** (2)
(1: Aalborg University; 2: Universidad de Valparaíso)

THE SPACE OF SCHOOL: GEOMETRY ASSESSMENT TOWARD A TRAINED EYE

TSG 41 – Uses of technology in primary mathematics education (up to age 10)

Co-chairs: Sophie **Soury-Lavergne** (France), Colleen **Vale** (Australia)

Team members: Francesca **Ferrara** (Italy), Krongthong **Khairiree** (Thailand), Silke **Ladel** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: C: turquoise, Main Building, room 125

Session Chair: Sophie **Soury-Lavergne**

Presentations: Stephen Isaac **Tucker*** (1), Patricia S. **Moyer-Packenham** (2)

(1: Virginia Commonwealth University; 2: Utah State University)

THE MODIFICATION OF ATTRIBUTES, AFFORDANCES, ABILITIES, AND DISTANCE
FOR LEARNING FRAMEWORK FOR USER-TOOL INTERACTIONS

Daniel **Walter***

(TU Dortmund)

THE USAGE OF TABLET-APPLICATIONS BY STUDENTS WITH SPECIAL LEARNING
NEEDS IN MATHEMATICS EDUCATION

Theodore **Chao***, Stephen **Lewis**

(The Ohio State University)

DEVELOPING MOBILE/TABLET TECHNOLOGY FOR TEACHERS TO ORCHESTRATE
MATHEMATICAL DISCUSSION

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: C: turquoise, Main Building, room 125

Session Chair: Colleen **Vale**

Presentations: Andrew Philip **Kwok***

(Diocesan Boys' School Primary Division)

USING COMPUTER IN TEACHING MATHEMATICS AND ITS EFFECTS ON MOTIVATION
AND LEARNING OUTCOMES OF PRIMARY STUDENTS

Christof **Schreiber***, Rebecca **Klose**

(Justus Liebig Universität Gießen)

TALKING MATHEMATICS: PRIMAPODCAST

Francesca **Ferrara***

(Università di Torino)

CHILDREN LEARNING NUMBERS WITH TOUCHCOUNTS

TSG 42 – Uses of technology in lower secondary mathematics education (age 10 to 14)

Co-chairs: Lynda **Ball** (Australia), Paul **Drijvers** (Netherlands)

Team members: Bärbel **Barzel** (Germany), Yiming **Cao** (China), Michela **Maschietto** (Italy)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 0076b

Session Chair: Bärbel **Barzel**

Presentations: Ahlam Adnan **Anabousy*** (1, 2), Michal **Tabach** (1)

(1: Tel-Aviv university; 2: Alqasimi Academic College of Education)

USING GEOGEBRA TO ENHANCE STUDENTS' INQUIRY ACTIVITY

Tobias **Rolfes***, Jürgen **Roth**, Wolfgang **Schnotz**

(University of Koblenz-Landau)

EFFECTS OF DYNAMIC VISUALIZATIONS ON THE LEARNING OF
MATHEMATICAL PHENOMENA

Carole **Dording*** (1), Romain **Martin** (1), Yves **Kreis** (1), Thibaud **Latour** (2)

(1: University of Luxembourg; 2: Luxembourg Institute of Science & Technology)

GEOGEBRATAO, VALIDATION OF AN ADAPTIVE LEARNING ENVIRONMENT
OF DYNAMIC GEOMETRY.

Emine **Aytekin***, Mine **Isıksal-Bostan**

(ODTÜ)

MIDDLE SCHOOL STUDENTS' ATTITUDES TOWARDS USE OF TECHNOLOGY
IN MATHEMATICS LESSON AND GRADE LEVEL DIFFERENCES

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 0076b

Session Chair: Yiming **Cao**

Presentations: Umit **Kul***

(Artvin Coruh University)

EFFECTS OF MATHEMATICAL SOFTWARE INTEGRATED PROFESSIONAL
DEVELOPMENT COURSE ON PRIMARY MATHEMATICS TEACHERS

Fei **Zhang*** (1), Hong **Yuan** (2)

(1: Jiangsu Second Normal University; 2: Teaching Research Department of Pingshan)

RESEARCH ON PRACTICE OF MATHEMATICS MICRO CURRICULUM DESIGN
IN JUNIOR HIGH SCHOOL

Zsolt **Lavicza*** (1), Markus **Hohenwarter** (1), Balazs **Koren** (2), Istvan **Juhos** (3)

(1: Johannes Kepler University; 2: Eotvos Lorand University; 3: University of Szeged)

DEVELOPING TEACHING RESOURCES AND A NEW TECHNOLOGY ENVIRONMENT
TO ENHANCE MATHEMATICS EDUCATION IN HUNGARY

Steen **Grode*** (1,2)

(1: Metropolitan University College; 2: Roskilde University)

BUILT AROUND IT





Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: E: mint, Economical Building, room 0076b

Session Chair: Paul **Drijvers**

Presentations: Gulay **Bozkurt***, Kenneth **Ruthven**
(University of Cambridge)

THE ACTIVITY STRUCTURE OF GEOGEBRA LESSONS

Edith **Lindenbauer***

(Pädagogische Hochschule Oberösterreich)

THE USE OF DYNAMIC WORKSHEETS TO SUPPORT FUNCTIONAL THINKING
IN LOWER SECONDARY SCHOOL

Lisa **Göbel***

(University of Duisburg-Essen)

COMPARING DIFFERENT DYNAMIC VISUALIZATIONS TO INVESTIGATE THE
ROLE OF PARAMETERS

Michela **Maschietto***

(University of Modena e Reggio Emilia)

CLASSICAL AND DIGITAL TECHNOLOGIES FOR THE PYTHAGOREAN THEOREM

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 0076b

Session Chair: Michela **Maschietto**

Presentations: Yves **Kreis*** (1), Joseph **Bertemes** (2), Amina **Kafai-Afif** (2), Ben **Haas** (2)
(1: University of Luxembourg; 2: SCRIPT – ADQS)

THE PERSONALIZED AND MULTILINGUAL MATHEMATICAL LEARNING ENVIRONMENT
MATHEMATIC

Barbara **Kimeswenger***

(Private Pädagogische Hochschule der Diözese Linz)

ADDRESSING QUALITY ASPECTS OF DYNAMIC MATHEMATICS MATERIALS

Vincenzo **Fragapane***

(Pädagogische Hochschule Karlsruhe)

APPLICATION SOFTWARE FOR MOBILE TECHNOLOGIES IN THE CONTEXT OF
MATHEMATICS AND TEACHING

TSG 43 – Uses of technology in upper secondary mathematics education (age 14 to 19)

Co-chairs: Colette **Laborde** (France), Stephen **Hegedus** (USA)

Team members: Luis **Moreno-Armella** (Mexico), Hans-Stefan **Siller** (Germany), Michal **Tabach** (Israel)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 1083

Group A – Session Chair: Hans-Stefan **Siller**

Presentations: Cristina **Eccius-Wellmann***, Rebeca **Ascencio-González**
(Universidad Panamericana)

A COMPUTER-AIDED ASSESSMENT FOR ALGEBRA STUDENTS

José Vicente **Giliberti***

(Universidad Nacional de Salta)

GEOGEBRA INCIDENCE ANALYSIS IN THE ACADEMIC PERFORMANCE OF
THE BEGINNER ENGINEERING STUDENTS

Francisco **Ugarte**, Mihály **Martínez***, Cecilia **Gaita**

(Pontificia Universidad Católica del Perú)

A DIDACTICAL SITUATION FOR THE AREA BY BOUNDED APPROACH

Location: E: mint, Economical Building, room 2085

Group B – Session Chair: Michal **Tabach**

Presentations: Kun **Xiang***, Lianghuo **Fan**

(University of Southampton)

CHINESE MATHEMATICS TEACHERS' USE OF TECHNOLOGY IN THEIR
INSTRUCTIONAL PRACTICE

Enver **Tatar** (1), Yılmaz **Zengin*** (2), Türkan Berrin **Kagızmanlı** (3)

(1: Atatürk University; 2: Dicle University; 3: Giresun University)

USING GEOGEBRA SOFTWARE IN THE LEARNING ENVIRONMENT IN THE LIGHT
OF MATHEMATICS TEACHERS' OPINIONS

Julia **Ollesch***, Markus **Vogel**, Tobias **Dörfler**

(Pädagogische Hochschule Heidelberg)

THE DEVELOPMENT OF TEACHERS' COMPETENCIES FOR MULTIMEDIA
USE IN MATHEMATICS LESSONS

Helena Cristina **Rocha***

(Faculdade de Ciências e Tecnologia)

TEACHERS' USE OF THE DIFFERENT REPRESENTATIONS IN A CONTEXT OF
TECHNOLOGY INTEGRATION





Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 1083

Group A – Session Chair: Stephen **Hegedus**

Presentations: Satoru **Sakanashi***

(Tokyo Metropolitan Setagaya Municipal Fukasawa Junior High School)

TEACHING MATERIALS ARE OBTAINED FROM EVERYDAY LIFE AND THE LESSON OF A PRIMARY FUNCTION IS CONSIDERED USING ICT

Priscilla Guez Rabelo **Amaral*** (1), Dirce Uesu **Pesco** (2), Humberto José **Bortolossi** (3)
(1: Colégio Pedro II; 2: Universidade Federal Fluminense; 3: Universidade Federal Fluminense)
EXPLORING GEOMETRY, ARITHMETIC AND ALGEBRA WITH TABLETS AND SMARTPHONES: TWO EXPERIENCES IN THE CONTEXT OF BASIC SCHOOL

Heinz **Schumann***

(University of Education Weingarten)

AUTOMATED ALGEBRAIC CALCULATION OF INTERACTIVELY CONSTRUCTED GEOMETRIC FIGURES – A DIDACTIC ANALYSIS

Olga **Fellus*** (1), Yaniv **Biton** (2), Dafna **Raviv** (2)

(1: University of Ottawa; 2: Centre for Educational Technology)

MORE STUDENTS DO MORE ADVANCED MATH: MATHEMATIZING IN A VIRTUAL HIGH SCHOOL MATHEMATICS COURSE OFFERED TO STUDENTS WHO L

Location: E: mint, Economical Building, room 2085

Group B – Session Chair: Luis **Moreno-Armella**

Presentations: Mohamed El-Sayed Ahmed **El-Demerdash*** (1),

Pedro Lealdino **Filho** (2), Christian **Mercat** (2)

(1: S2HEP; 2: S2HEP)

KINESTHETIC PROMOTION OF FUNCTION GRAPH RECOGNITION AT UNIVERSITY LEVEL

Mdutshekela **Ndlovu***

(Stellenbosch University)

AN INSTRUMENTAL GENESIS OF THE DERIVATIVE WITH SKETCHPAD DYNAMIC MATHEMATICS SOFTWARE

Veysel **Akçakın*** (1,2), Gürcan **Kaya** (2), Mehmet **Bulut** (2)

(1: Usak University; 2: Gazi University)

NINTH GRADE STUDENTS' VIEWS ABOUT GEOMETRIC FUNCTIONS APPROACH AND DYNAMIC MATHEMATICS SOFTWARE ON TEACHING FUNCTIONS

Hideyo **Makishita***

(Shibaura Institute of Technology)

PROPOSAL OF FIGURE DRAWING USING CUI AND GUI – APPLICATION OF MATHEMATICS TO MATHEMATICS

Ruth Elizabeth **Galindo Navarro*** (1), Marcela **Perlwitz** (2), Claudio **Fuentealba Acuña** (3)

(1: Universidad de Playa Ancha de Ciencias de la Educación; 2: Ivy Tech Community College. Lafayette; 3: Universidad de Santiago de Chile)

APPROXIMATING POLYNOMIAL FUNCTION WITH TRIGONOMETRIC FUNCTION

Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: E: mint, Economical Building, room 2085

Session Chair: Jana **Trgalova**

Presentations: Ilyas **Karadeniz*** (1), Denisse R. **Thompson** (2)
(1: Loughborough University; 2: University of South Florida)

MATHEMATICS TEACHERS' PURPOSES AND VIEWS OF USING GRAPHING CALCULATORS

Balazs **Koren*** (1), Theodosia **Prodromou** (2), Zsolt **Lavicza** (3)

(1: Eotvos Lorand University; 2: University of New England; 3: Cambridge University)

TEACHERS ROLE IN TECHNOLOGY-SUPPORTED MATHEMATICS LESSON SEQUENCES

Peter **Esperanza*** (1), Kristin **Fabian** (2)

(1: Barstow High School; 2: University of Dundee)

STUDENT PERCEPTIONS ON THE USE OF THE FLIPPED CLASSROOM MODEL FOR ADVANCED PLACEMENT MATHEMATICS

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 2085

Session Chair: Colette **Laborde**

Presentations: María Cristina **Alancay Velázquez***
(Ministerio de Educación)

LAS TIC EN LAS AULAS DE TONONO

Inder Kumar **Rana***

(Department of Mathematics)

ICT (I SEE IT) IN MATH EDUCATION – INDIAN PERSPECTIVE

Roghayeh **Akhbari*** (1), Hossein **Nabati** (2), Nastaran **Akbari** (3), Toktam Akbari **Khalaj** (4)

(1: Islamic Azad University of Mashhad Iran; 2: Mashhad University of Medical sciences;

3: Imam Reza International University; 4: Mashhad University of Medical sciences)

GENERAL WIEW OF COMPARISON BETWEEN SMART BOARD & BLACK BOARD IN GENERAL MATHEMATHICS BOOK 1 & 2 AMONG IRANIAN HIGH SCHOOL

Nilam **Shrestha***

(Ullens School)

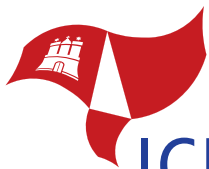
EFFECT OF GEOGEBRA SIMULATION IN TEACHING DIFFERENTIAL CALCULUS IN INTERNATIONAL BACCALAUREATE DIPLOMA PROGRAM

Jaime Carvalho **Silva***

(University of Coimbra)

USING THE GRAPHING CALCULATOR IN A DIGITAL WORLD





TSG 44 – Distance learning, e-learning, blended learning

Co-chairs: Rúbia Barcelos **Amaral** (Brazil), Veronica **Hoyos** (Mexico)

Team members: Els **de Geest** (UK), Jason **Silverman** (USA), Rose **Vogel** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 206

Session Chair: Rose **Vogel**

Presentations: Jonathan Todd **Lee***

(Elon University)

TECHNOLOGY BARRIERS FOR A FLIPPED MASTERY CYCLE CALCULUS II CLASS

Maria Estela **Navarro** (1), Veronica **Hoyos*** (2), Victor **Raggi** (3),

William **Gallardo** (4), Sergio **Vazquez** (5)

(1: Universidad Pedagógica Nacional; 2: Universidad Pedagógica Nacional;

3: Universidad Pedagógica Nacional; 4: Universidad Pedagógica Nacional;

5: Universidad Pedagógica Nacional)

HYBRID LEARNING ENVIRONMENTS MOOC OF DIFFERENTIAL AND INTEGRAL CALCULUS (A PROJECT)

Bijeta **Kumar**, Bibhya **Sharma***

(The University of the South Pacific)

SUCCESS OF THE FIRST YEAR AT-RISK STUDENTS IN UNIVERSITY MATHEMATICS COURSES THROUGH ADAPTIVE INTERVENTIONS

Yasuyuki **Nakamura*** (1), Tetsuya **Taniguchi** (2), Kentaro **Yoshitomi** (3),

Shizuka **Shirai** (4), Tetsuo **Fukui** (4), Takahiro **Nakahara** (5)

(1: Nagoya University; 2: Nihon University; 3: Osaka Prefecture University; 4: Mukogawa Women's University;

5: Sangensha LLC.)

STACK PROJECT IN JAPAN; ITEM BANK SYSTEM, MATH INPUT INTERFACE AND QUESTION SPECIFICATION

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 206

Session Chair: Veronica **Hoyos**

Presentations: Maxima Joyosa **Acelajado***

(De La Salle University – Dasmariñas)

FLIPPED TEACHING APPROACH IN COLLEGE ALGEBRA: COGNITIVE AND NONCOGNITIVE GAINS

Maman **Fathurrohman***, Hepsi **Nindiasari**, Nurul **Anriani**, Aan Subhan **Pamungkas**

(Universitas Sultan Ageng Tirtayasa)

THE DEVELOPMENT OF TECHNOLOGY-BASED KIT FOR USE BY MATHEMATICS TEACHERS

Eugenia **Taranto*** (1), Virginia **Alberti** (2), Sara **Labasin** (3)

(1: Dipartimento di Matematica G.Peano; 2: I.I.S. "B. Castelli"; 3: L.S. "P. Gobetti")

MATH MOOC UNITO: A PROGRAM FOR TEACHERS DESIGNED BY TEACHERS

TSG 45 – Knowledge in / for teaching mathematics at primary level

Co-chairs: Carolyn **Maher** (USA), Peter **Sullivan** (Australia)
Team members: Hedwig **Gasteiger** (Germany), Soo Jin **Lee** (Korea)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: E: mint, Economical Building, room 5018

Session Chair: Peter **Sullivan**

Presentations: Ismail Özgür **Zembat** (1), Ebru **Bayram*** (2)

(1: Mevlana (Rumi) University; 2: Ay e Hüseyin Özkan Middle School)

WHAT IT MEANS TO HAVE A SPECIALIZED CONTENT KNOWLEDGE OF MEASUREMENT CONCEPTS

Ian **Campton***, Julie-Ann **Edwards**

(University of Southampton)

FRAGMENTED PIECES: THE MATHEMATICAL CONTENT KNOWLEDGE OF PRIMARY SCHOOL TEACHERS

Lorraine Bernadette **Harbison*** (1), Joseph Augustine **Harbison** (2)

(1: Church of Ireland College of Education; 2: University of Dublin)

MATHEMATICS RESULTS AT SCHOOL COMPLETION AND BASIC COMPETENCY IN INITIAL TEACHER EDUCATION STUDENTS

Jessica **Hoth***, Martina **Döhrmann**

(University of Vechta)

PROFESSIONAL COMPETENCIES OF MATHEMATICS TEACHERS AND THEIR RELATION TO CREATIVITY AND GIFTEDNESS

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 5018

Session Chair: Hedwig **Gasteiger**

Presentations: Dilek **Girit***, Didem **Akyüz**

(Middle East Technical University)

MATHEMATICAL KNOWLEDGE FOR TEACHING OF PATTERNS: A CASE STUDY OF MIDDLE SCHOOL MATHEMATICS TEACHER

Cheng-Yao **Lin***, Eunmi **Joung**, Miran **Byun**

(Southern Illinois University)

PRE-SERVICE TEACHERS' CONCEPTUAL AND PROCEDURAL KNOWLEDGE OF DECIMAL OPERATIONS

Rachael Eriksen **Brown** (1), Gili Gal **Nagar** (2), Chandra Hawley **Orrill*** (2),

Travis **Weiland** (2), James **Burke** (2)

(1: Penn State University- Abington; 2: UMass Dartmouth)

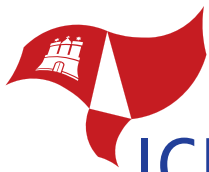
CONSIDERING TEACHER KNOWLEDGE: A CASE STUDY OF PROPORTIONAL REASONING IN AND OUT OF THE CLASSROOM

Xiong **Wang***

(University of Alberta)

THE CONCEPT STUDY OF EQUIVALENT FRACTIONS: KNOWLEDGE AND KNOWING FOR TEACHING





James **Burke*** (1), Chandra **Orrill** (1), Gili Gal **Nagar** (1), Travis **Weiland** (1), Rachael Eriksen **Brown** (2)
(1: University of Massachusetts Dartmouth; 2: Penn State University-Abington)

ADDRESSING COHERENCE OF TEACHER'S KNOWLEDGE RELATING FRACTIONS AND RATIOS WITH EPISTEMIC NETWORK ANALYSIS

Reyhan **Tekin Sitrava*** (1), Mine **Isiksal-Bostan** (2)

(1: Hacettepe University; 2: Middle East Technical University)

A STUDY ON INVESTIGATING MIDDLE SCHOOL TEACHERS' CURRICULUM KNOWLEDGE: THE CASE OF THE VOLUME OF PYRAMIDS

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: E: mint, Economical Building, room 5018

Session Chair: Carolyn A. **Maher**

Presentations: Lawan **Abdulhamid***

(University of the Witwatersrand)

SUPPORTING 'ELABORATION' IN PRIMARY SCHOOL TEACHERS' HANDLING OF INCORRECT ANSWERS IN MATHEMATICS CLASSROOMS

Mi Yeon **Lee*** (1), Dionne **Cross Francis** (2)

(1: Arizona State University; 2: Indiana University)

INVESTIGATING THE RELATIONSHIP BETWEEN ELEMENTARY TEACHERS' PERCEPTION ABOUT THE USE OF STUDENTS' THINKING AND THEIR PRO

Adair **Mendes Nacarato***

(University São Francisco)

LEARNING TO TEACH MATHEMATICS IN A COMMUNITY OF INQUIRY

Libuse **Samkova*** (1), Marie **Ticha** (2)

(1: Faculty of Education; 2: Institute of Mathematics of the Czech Academy of Sciences)

ON THE WAY TO ENHANCE FUTURE PRIMARY TEACHERS' BELIEFS ABOUT MATHEMATICS VIA INQUIRY BASED UNIVERSITY COURSES

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 5018

Session Chair: Soo Jin **Lee**

Presentations: Arne **Jakobsen***, Mercy **Kazima**

(University of Stavanger)

TESTING VALIDITY OF MATHEMATICAL TASKS OF TEACHING IN MALAWI PRIMARY SCHOOLS

Nadia Diogo **Ferreira***

(Instituto de Educação)

THE ROLE OF REPRESENTATIONS IN THE PRACTICE OF THREE PROSPECTIVE ELEMENTARY SCHOOL TEACHERS

Joselene Lima **Pinheiro*** (1), Marcilia Chagas **Barreto** (2)

(1: Universidade da Integração Internacional da Lusofonia Afro-Brasileira;

2: Universidade Estadual do Ceará)

REGISTERS OF SEMIOTICS REPRESENTATION BY MATHEMATICS TEACHERS: ASPECTS RELATED TO PROBLEM SOLVING

Charalambos **Charalambous**, Sofia **Agathangelou***, Maria **Papacharalambous**
(University of Cyprus)

DEVELOPING TEACHERS' MATHEMATICAL KNOWLEDGE FOR TEACHING:
(RE)CONSIDERING THE ROLE OF INSTRUCTION

Reidar **Mosvold**, Janne **Fauskanger***
(University of Stavanger)

MATHEMATICAL TASKS OF TEACHING AND THE PROFESSIONAL AND
CULTURAL ASPECTS OF TEACHING

Francesca **Neri Macchiaverna***, Ana Maria Millán **Gasca**
(Roma Tre University)

THE ROLE OF STAGE PRESENCE IN TEACHING MATH

TSG 46 – Knowledge in/for teaching mathematics at secondary level

Co-chairs: Ruhama **Even** (Israel), Xinrong **Yang** (China)

Team members: Nils **Buchholtz** (Germany), Charalambos **Charalambous** (Cyprus),
Tim **Rowland** (Great Britain)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: I: blue, Philosophical Tower, room 701

Group A – Session Chair: Heather **Howell**

Presentations: Hyman **Bass***
(University of Michigan)

KNOWLEDGE OF MATHEMATICAL CONNECTIONS FOR TEACHING

Sven Schueler*, Bettina **Roesken-Winter**
(Humboldt-Universität zu Berlin)

MEASURING MATHEMATICS TEACHERS' PROFESSIONAL KNOWLEDGE
IN PROBABILITY AND STATISTICS

Sotirios **Zoitsakos*** (1), Theodossios **Zachariades** (1), Charalampos **Sakonidis** (2)
(1: University of Athens; 2: Democritus University of Thrace)

THE INNER AND OUTER HORIZON OF TEACHERS' MATHEMATICAL KNOWLEDGE
IN ACTION: THE CASE OF AN INFINITE DECIMAL NUMBER

Thorsten **Scheiner***
(University of Hamburg)

ARE WE TRAPPED IN OLD HABITS? REVISITING WAYS OF THINKING IN
CONCEPTUALIZING TEACHER KNOWLEDGE

Location: I: blue, Philosophical Tower, room 706

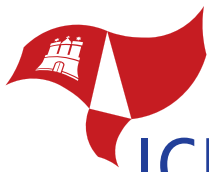
Group B – Session Chair: Stefanie **Schumacher**

Presentations: Marita **Friesen*** (1), Sebastian **Kuntze** (1), Markus **Vogel** (2)

(1: Ludwigsburg University of Education; 2: Heidelberg University of Education)

ASSESSING PRE-SERVICE TEACHERS' COMPETENCE OF ANALYSING CLASSROOM
SITUATIONS: A VIGNETTE-BASED TEST





Florence **Mamba***

(University of Malawi)

A PRESERVICE SECONDARY SCHOOL TEACHER'S KNOWLEDGE OF SOLVING QUADRATIC EQUATIONS

Olivia Claire **Fitzmaurice** (1), Patrick **Johnson*** (1), Niamh **O'Meara** (2), Sean **Lacey** (3)

(1: University of Limerick; 2: EPI*STEM; 3: Cork Institute of Technology)

INSIGHTS INTO PRESERVICE TEACHERS' MISCONCEPTIONS OF LINEAR EQUATIONS

Lena **Pankow***, Kirsten **Benecke**

(University of Hamburg)

VALIDATION STUDY TEDS-FOLLOW UP: IDENTIFICATION OF STUDENT ERRORS WITHIN A TIMED TEST

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: I: blue, Philosophical Tower, room 701

Group A – Session Chair: Hyman **Bass**

Presentations: Miguel **Montes*** (1), Carlos Miguel **Ribeiro** (2), José **Carrillo** (1)

(1: University of Huelva; 2: Centro de Investigação sobre o Espaço e as Organizações (CIEO))

TOWARDS A TOPOLOGY OF MATHEMATICAL CONNECTIONS IN TEACHER KNOWLEDGE

Heather **Howell*** (1), Yvonne **Lai** (2), Geoffrey Charles **Phelps** (1)

(1: Educational Testing Service; 2: University of Nebraska – Lincoln)

CONCEPTUALIZING MATHEMATICAL KNOWLEDGE FOR TEACHING AT SECONDARY LEVEL: DO PRIMARY MODELS EXTEND?

Casey W. **Hawthorne**, Randolph A. **Philipp***

(San Diego State University)

RECONCEPTUALIZING A MATHEMATICAL DOMAIN AROUND REASONING: CONSIDERING TEACHERS' PERSPECTIVES ABOUT INTEGERS

Anika **Dreher***, Anke **Lindmeier**, Aiso **Heinze**

(IPN Kiel)

BRIDGING THE GAP BETWEEN ACADEMIC AND SCHOOL MATHEMATICS – A KEY CHALLENGE FOR SECONDARY TEACHERS' MATHEMATICAL CK

Location: I: blue, Philosophical Tower, room 706

Group B – Session Chair: John **Suffolk**

Presentations: Christoph **Ableitinger***

(Universität Wien)

TUTORS QUALIFICATION IN RESPONDING TO PUPILS DURING PRIVATE LESSONS

Stefanie **Schumacher***, Michael **Kleine**

(Bielefeld University)

BEST TEACHER: A TEST INSTRUMENT FOR SECONDARY SCHOOL TEACHERS' PROFESSIONAL KNOWLEDGE IN DESCRIPTIVE STATISTICS

John **Suffolk***

(Retired)

TEACHING STAGES AND STYLES

Maria **De los Angeles Cruz Quiñones*** (1), Mourat **Tchoshanov** (2),
Maria Dolores **Cruz Quiñones** (3)
(1: Universidad Autonoma de Ciudad Juarez; 2: University of Texas at El Paso;
3: New Mexico State University)

**A MIXED METHODS STUDY OF THE MATHEMATICAL TEACHER CONTENT
KNOWLEDGE AND KNOWING-TO ACT AT THE MIDDLE SCHOOL LEVEL**

David **Glassmeyer*** (1), Aaron **Brakoniecki** (2), Julie **Amador** (3)
(1: Kennesaw State University; 2: Boston University; 3: University of Idaho)
CHALLENGING TEACHERS' ASSUMPTIONS OF TRIGONOMETRY THROUGH SLOPE RATIOS

Nils **Buchholtz***
(University of Hamburg)
**CONCEPTUALIZING MATHEMATICAL PEDAGOGICAL CONTENT KNOWLEDGE
FOR STUDIES ON TEACHERS' PROFESSIONAL KNOWLEDGE**

Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: I: blue, Philosophical Tower, room 701

Group A – Session Chair: Inah **Ko**
Presentations: Rui **Zhao***
(Jinzhong University)
**AN INVESTIGATION OF RPE-SERVICE SECONDARY TEACHERS' STATISTICAL
KNOWLEDGE FOR TEACHING AND BELIEFS ABOUT STATISTICS**

Inah **Ko*** (1), Patricio **Herbst** (1), Yung Chi **Lin** (2)
(1: University of Michigan; 2: National Changhua University of Education)
**SUBJECT MATTER KNOWLEDGE OF GEOMETRY NEEDED IN TASKS OF TEACHING
AND TEACHERS' GEOMETRY TEACHING EXPERIENCE**

Isabelle **Demonty***, Joelle **Vlassis**
(University of Luxembourg)
**DEVELOPING A TOOL FOR ASSESSING ELEMENTARY ALGEBRAIC KNOWLEDGE
FOR TEACHING: A TWOFOLD PERSPECTIVE**

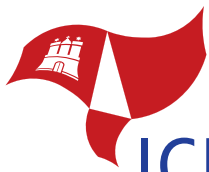
Location: I: blue, Philosophical Tower, room 706

Group B – Session Chair: Eileen **Murray**
Presentations: Eileen **Murray*** (1), Nicholas **Wasserman** (2)
(1: Montclair State University; 2: Teachers College Columbia University)
**CONNECTING SOLVING EQUATIONS IN AN ADVANCED CONTEXT TO SECONDARY
MATHEMATICS INSTRUCTION**

Shikha **Takker***, K. **Subramaniam**
(Homi Bhabha Centre for Science Education)
CHANGING TEACHER KNOWLEDGE-IN-PRACTICE: THE CASE OF DECIMAL FRACTIONS

Mirosława Ewa **Sajka***, Roman **Rosiek**
(Pedagogical University of Cracow)
**USING EYETRACKING FOR RESEARCH ON "MATHEMATICAL CULTURE"
OF PRESERVICE TEACHERS**





Lisnet Elizabeth **Mwadzaangati***

(University of Malawi)

USING PROOF ANALYSIS TO EXAMINE KNOWLEDGE FOR TEACHING
GEOMETRIC PROOFS.

TSG 47 – Pre-service mathematics education of primary teachers

Co-chairs: Keiko **Hino** (Japan), Gabriel **Stylianides** (UK)

Team members: Katja **Eilerts** (Germany), Caroline **Lajoie** (Canada), David **Pugalee** (USA)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: G: green, Social Science Building, room A215

Group A – Session Chair: David **Pugalee**

Presentations: George **Gadanidis***, Immaculate **Namukasa**
(Western University)

DEVELOPING AND RESEARCHING ONLINE MATHEMATICS TASKS AND RESOURCES
FOR K-6 PRESERVICE TEACHERS

Ryan Glenn **Zonnefeld***, Valorie Lynn **Zonnefeld**

(Dordt College)

TECHNOLOGY-INFUSED CLASSROOMS: BRIDGING THE GAP IN PRE-SERVICE
MATHEMATICS TEACHER PREPARATION

Anne Marie S. **Marshall*** (1), Kadian M. **Callahan** (2)

(1: Berry College; 2: Kennesaw State University)

MATHEMATICS TEACHER EDUCATORS' KNOWLEDGE DOMAINS
WHEN COLLABORATIVELY PLANNING FOR PRE-SERVICE PRIMARY TEACHERS

Location: G: green, Social Science Building, room A315

Group B – Session Chair: Katja **Eilerts**

Presentations: Gabriel **Huszar*** (1), Mar **Moreno** (2), Assumpta **Estrada** (1), Ivan **Barbero** (1)

(1: University of Lleida; 2: University of Alicante)

AN EXPLORATORY STUDY ABOUT THE RESPONSES OF THE PROSPECTIVE PRIMARY
TEACHERS USING THE CONCEPTS OF MEASUREMENT IN MATHS

Mine **Isiksal-Bostan***, Seçil **Yemen-Karpuzcu**

(Middle East Technical University)

PROSPECTIVE MIDDLE SCHOOL MATHEMATICS TEACHERS' KNOWLEDGE ON
CYLINDER AND PRISM: GENERATING DEFINITIONS AND RELATIONSHIP

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: G: green, Social Science Building, room A215

Group A – Session Chair: Gabriel **Styliandes**

Presentations: Annette Hessen **Bjerke***

(Oslo and Akershus University)

MEASURING SELF-EFFICACY IN TEACHING MATHEMATICS

Lenni **Haapasalo***, Pasi **Eskelinen**

(University of Eastern Finland)

ASSESSING TEACHER EDUCATION THROUGH NCTM STANDARDS AND SUSTAINABLE ACTIVITIES

Siyin **Yang***

(California State University Long Beach)

A COMPARISON OF CURRICULUM STRUCTURE FOR PROSPECTIVE ELEMENTARY MATH TEACHER PROGRAMS BETWEEN THE UNITED STATES AND CHINA

Gabriela Valverde **Soto***

(University of Costa Rica)

ENHANCING THE MATHEMATICS COMPETENCIES OF FUTURE ELEMENTARY TEACHERS: REVIEW OF A DESIGN RESEARCH

Victoria **Kofman** (2), Sayonita **Ghosh Hajra** (3), Oleg **Ostrovskiy*** (1)

(1: The University of Illinois at Chicago; 2: Stella Academy; 3: University of Utah)

VISUAL REPRESENTATIONS OF WORD PROBLEMS

Location: G: green, Social Science Building, room A315

Group B – Session Chair: Keiko **Hino**

Presentations: Viren **Ramdhany***

(Wits University)

THE ROLE OF RECOGNITION AND REALISATION RULES IN THE PREPARATION OF PRIMARY MATHEMATICS TEACHERS

Macarena **Larrain*** (1,2)

(1: Universidad de los Andes; 2: University of Hamburg)

DIAGNOSTIC COMPETENCE OF FUTURE PRIMARY TEACHERS – HOW CAN IT BE FOSTERED?

Ginger A. **Rhodes***, Shelby P. **Morge**, Heidi J. **Higgins**

(University of North Carolina Wilmington)

PRESERVICE TEACHERS' VIEWS OF MATHEMATICS, MATHEMATICS TEACHING, AND AUTHORITY

Cindy **Xin***, Petra **Menz**

(Simon Fraser University)

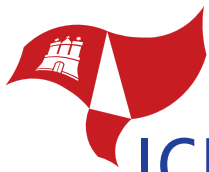
METACOGNITIVE KNOWLEDGE, CONFIDENCE AND BELIEFS TARGETED THROUGH REFLECTIVE WRITING IN MATHEMATICS

Pamela Alejandra **Reyes-Santander** (1), Martin **Höfele*** (2)

(1: Pontificia Universidad Católica de Valparaíso; 2: Bertolt Brecht Realschule)

GRUNDTVORSTELLUNGEN (GV) AND BELIEFS OF PRE-SERVICE TEACHERS ABOUT TEACHING ADDITION





Third Session: Friday, 29 July 2016, 15.00 – 16.00
Location: G: green, Social Science Building, room A215

Group A – Session Chair: Katja **Eilerts**

Presentations: Ronald **Keijzer*** (1), Gerard **Boersma** (2)
(1: Hogeschool iPabo; 2: HAN)

LOW PERFORMERS IN MATHEMATICS IN PRIMARY TEACHER EDUCATION

Irina **Lyublinskaya***

(College of Staten Island)

ARE YOU SMARTER THAN A 4TH GRADER? COMPARING MATHEMATICS CONTENT KNOWLEDGE OF ELEMENTARY TEACHERS AND 4TH GRADE STUDENTS

Aitor **Villarreal***, Lluís **Albarracín**, Núria **Gorgorió**

(Universitat Autònoma de Barcelona)

BASIC MATHEMATICAL KNOWLEDGE OF STUDENTS ENROLLING FOR PRIMARY EDUCATION UNIVERSITY DEGREES

Location: G: green, Social Science Building, room A315

Group B – Session Chair: Caroline **Lajoie**

Presentations: Ronaldo Barros Ripardo **Ripardo***, Claudete Marques **de Medeiros Medeiros**, Tadeu Oliver Gonçalves **Gonçalves**

(Universidade Federal do Pará)

BECOMING A MATH TEACHER: THE SUPERVISED INTERNSHIP AS POSSIBLE WAY FOR REFLEXIVE PRACTICE.

Bilge **Yurekli***

(Gazi University)

QUALITATIVE INVESTIGATION OF FIELD EXPERIENCES IN TERMS OF PRE-SERVICE TEACHERS' SELF-EFFICACY FOR TEACHING MATHEMATICS

Erin **Moss***

(Millersville University of Pennsylvania)

RELATIONSHIPS BETWEEN VIDEO CLUB PARTICIPATION AND IDENTITY IN PRESERVICE ELEMENTARY TEACHERS

Filip **Roubicek*** (1), Alena **Hospesova** (2)

(1: Institute of Mathematics of the Czech Academy of Sciences;

2: University of South Bohemia in Ceske Budejovice)

PROBLEMS FOR INQUIRY BASED MATHEMATICS EDUCATION POSED BY FUTURE TEACHERS

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: G: green, Social Science Building, room A215

Group A – Session Chair: David **Pugalee**

Presentations: Cory A. **Bennett** (1), Mary Pat **Sjostrom*** (2)

(1: Idaho State University; 2: Winthrop University)

ENGAGING PROSPECTIVE ELEMENTARY TEACHERS' IN PROBLEM SOLVING TO INFORM THEIR UNDERSTANDING OF TEACHING PROBLEM SOLVING

Oral Communications

OC

Hanan **Innabi***
(Free Lancer)

STRATEGIES FOR TEACHING THINKING SKILLS: PRE-SERVICE COURSE FOR
MATHEMATICS EDUCATION CANDIDATES AT UAE UNIVERSITY

Yupadee **Panarach***

(Kamphaeng Phet Rajabath University)

THE DEVELOPMENT PROCESS OF MATHEMATICS PROJECT BY USING DEMING
CYCLE FOR PRE-SERVICE TEACHER

Location: G: green, Social Science Building, room A315

Group B – Session Chair: Caroline **Lajoie**

Presentations: Yi Jung **Lee***

(University of Georgia)

PRESERVICE ELEMENTARY SCHOOL TEACHERS' PERCEIVED DIFFICULTIES IN
DEVELOPING THEIR KNOWLEDGE FOR TEACHING MATHEMATICS

Ratera Safiel **Mayar***

(Tanzania Institute of Education)

IMPACT OF MATHEMATICS FOR TEACHING THROUGH CONCEPT STUDY ON PRIMARY
SCHOOL PRE SERVICE TEACHERS' PROFESSIONAL KNOWLEDGE

Ana **Chiummo**, Emilio Celso **de Oliveira***

(Universidade Paulista)

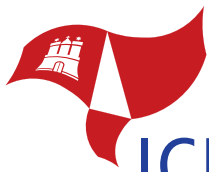
TEACHER'S KNOWLEDGE: TEACHING EXPERIENCES AT GRADUATION

Gudny Helga **Gunnarsdottir**, Gudbjorg **Palsdottir***

(University of Iceland)

SPECIALISED COURSES IN MATHEMATICS TEACHER EDUCATION





TSG 48 – Pre-service mathematics education of secondary teachers

Co-chairs: Rongjin **Huang** (USA), Marilyn E. **Strutchens** (USA)

Team members: Leticia **Losano** (Argentina), Despina **Potari** (Greece), Björn **Schwarz** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: G: green, Social Science Building, room B137

Group A – Session Chair: Marilyn **Strutchens**

Presentations: Lars **Holzäpfel***, Andreas **Schulz**

(PH Freiburg)

SUCCESSFULLY LINKING THEORY AND PRACTICE THROUGH UNIVERSITY LEVEL SUPERVISION OF THE INTERNSHIP

Ruthmae **Sears*** (1), Patricia **Brosnan** (2), Maureen **Grady** (3), Charity **Cayton** (3), Jennifer **Oloff-Lewis** (4), Stephanie **Biagetti** (5), Jami **Stone** (6), Janet **Andreasen** (7), Johannah **Maynor** (8), Karen **Hollebrands** (9), Cathy **Spencer** (10), Laurie **Riggs** (11), Juli (1: University of South Florida; 2: Ohio State University; 3: East Carolina University; 4: California State University; 3: East Carolina University; 4: California State University; 4: California State University; 5: California State University; 6: Black Hills State University)
A COLLABORATIVE EFFORT TO EXAMINE CO-PLANNING AND CO-TEACHING DURING CLINICAL EXPERIENCES

Limin **Jao***

(McGill University)

THE IMPORTANT THING ABOUT SECONDARY PRE-SERVICE TEACHER EDUCATION: PUSHING PEDAGOGICAL BOUNDARIES

Location: G: green, Social Science Building, room B537

Group B – Session Chair: Despina **Potari**

Presentations: Burçin **Gökkurt*** (1), Yasin **Soylu** (2)

(1: Bartin University; 2: Ataturk University)

EXAMINATION OF MIDDLE SCHOOL MATHEMATICS TEACHERS' PEDAGOGICAL CONTENT KNOWLEDGE IN TERMS OF TWO COMPONENTS: THE SAMPLE

Samira **Zaidan*** (1), Vinicio **Santos** (2)

(1: Faculdade de Educação – UFMG; 2: Faculdade de Educação – USP)

THE "PEDAGOGICAL CONTENT KNOWLEDGE" AS THE FOCUS, NOT A COMPLEMENT, OF THE INITIAL FORMATION OF MATHEMATICS TEACHERS

Deming **Yan***, Hongwei **Wang**

(Henan Institute of Education)

TRAINING OF TEACHING ABILITY OF MATHEMATICS NORMAL STUDENTS – CASE STUDY OF TWO EXCELLENT MATHEMATICS NORMAL STUDENTS

Evangeline F. **Golla***

(Philippine Normal University)

EXAMINING PRESERVICE SECONDARY TEACHERS' MATHEMATICS KNOWLEDGE FOR TEACHING AND CHALLENGES IN IMPROVING TEACHER QUALITY

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: G: green, Social Science Building, room B137

Group A – Session Chair: W. Gary **Martin**

Presentations: Mikhail **Epshtein*** (1), Irina **Lyublinskaya** (2), Stephanie **Sheehan** (2)
(1: St. Petersburg State University; 2: College of Staten Island)

SHORT-TERM INTERNATIONAL PROGRAM FOR PRE-SERVICE STEM TEACHERS
AS A FORM OF PROFESSIONAL DEVELOPMENT

Wellington Lima **Cedro***

(Universidade Federal de Goiás)

REFLECTING ON SUPERVISED TEACHING PRACTICE EXPERIENCES:
THE MATHEMATICS TEACHER'S EDUCATION UNDER THE SPOTLIGHT

Mónica Ester **Villarreal***, Cristina Beatriz **Esteley**

(Facultad de Matemática)

PRE-SERVICE TEACHERS' NARRATIVES ABOUT THEIR FIRST TEACHING PRACTICES

Location: G: green, Social Science Building, room B537

Group B – Session Chair: Despina **Potari**

Presentations: Christian **Klostermann***

(Carl von Ossietzky University Oldenburg)

PROSPECTIVE TEACHERS' CAPABILITIES OF ANTICIPATIONS REGARDING STUDENTS
ARGUMENTATION DURING REASONING TASKS

Erica Dorethea **Spangenberg***, Chris **Myburgh**

(University of Johannesburg)

PRE-SERVICE TEACHERS' PERCEPTIONS OF THEIR OWN BELIEFS ON THE NATURE
OF MATHEMATICS IN A SOUTH AFRICAN CONTEXT

Natalie Hock*, Rita **Borromeo-Ferri**

(University of Kassel)

PROMOTING DIAGNOSTIC COMPETENCIES OF PRE-SERVICE TEACHERS BY
CONNECTING JOINT SEMINARS WITH IN-SERVICE TEACHERS

Hannah **Heinrichs***

(Universität Hamburg)

ASSESSING AND PROMOTING FUTURE TEACHERS' DIAGNOSTIC COMPETENCE

Cheryl Kumpf **Van Ness***

(Rutgers University Graduate School of Education)

CREATING AND USING VIDEO NARRATIVES FOR SECONDARY PRESERVICE
TEACHERS' STUDYING OF ARGUMENTATION

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: G: green, Social Science Building, room B137

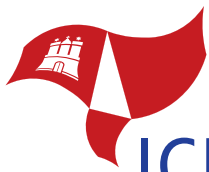
Group A – Session Chair: Joao Pedro **da Ponte**

Presentations: Talma **Leviatan*** (1), Laure **Barthel** (2)

(1: Tel Aviv university; 2: Hadassah College Jerusalem)

NUMBER SYSTEMS – A KEY "BRIDGING" COURSE IN TEACHERS'
TRAINING PROGRAM





Eun **Jung***

(University of Georgia)

ISSUES IN FRACTIONAL CURRICULA: PRESERVICE TEACHERS' UNDERSTANDING OF FRACTIONS AS OPERATORS

Eric **Kuennen***

(University of Wisconsin Oshkosh)

PRE-SERVICE SECONDARY TEACHERS' MATHEMATICS KNOWLEDGE AND BELIEFS IN THE US, GERMANY AND CHINA

Sergey **Atanasyan*** (1), Nataliia **Chuikova** (1), Sergey **Polikarpov** (1), Ildar **Safuanov** (2)
(1: Moscow Pedagogical State University; 2: Moscow City Pedagogical University)
NEW APPROACHES TO MATHEMATICS TEACHERS TRAINING IN MOSCOW

Meltem **Koçak**, Yasin **Soylu***

(Atatürk University)

ANALYSIS OF THE PROSPECTIVE TEACHERS OF MATHEMATICS' STRATEGY KNOWLEDGE IN RELEVANCE WITH THE ALGEBRA FORMULAS

Location: G: green, Social Science Building, room B537

Group B – Session Chair: Rongjin **Huang**

Presentations: Wolfgang **Weigel***

(Universität Würzburg)

PRODUCING VIDEOS – A LITTLE HELPER IN MATHEMATICS TEACHER EDUCATION

Kyomi **Takuma** (1), Seiji **Moriya*** (2)

(1: Ritsumeikan Uji Junior & Senior High School; 2: Tamagawa University)

POSSIBILITY OF INTERNATIONAL COOPERATIVE DISTANCE LECTURE AND SEMINAR FOR TRAINING MATHEMATICS TEACHERS

Marie-Elene **Bartel***, Jürgen **Roth**

(University Landau)

VIVIAN – A VIDEOTOOL TO PROMOTE AND ASSESS DIAGNOSTIC SKILLS OF PRESERVICE TEACHERS

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: G: green, Social Science Building, room B137

Session Chair: Leticia **Losano**

Presentations: Annatoria Zanele **Ndlovu***

(University of KwaZulu Natal)

A GENETIC DECOMPOSITION OF CRAMER'S RULE

Ceneida **Fernández*** (1), Mar **Moreno** (1), M. Luz **Callejo** (1), Gloria **Sánchez-Matamoros** (2)

(1: University of Alicante; 2: University of Sevilla)

HOW PROSPECTIVE TEACHERS ANTICIPATE STUDENTS ANSWERS TO PROBLEMS INVOLVING THE LIMIT CONCEPT

Catherine **Bénéteau** (1), Sarah **Bleiler-Baxter** (2), Gladis **Kersaint** (1), Milé **Krajcevski*** (1)

(1: University of South Florida; 2: Middle Tennessee State University)

NAVIGATING CO-TEACHING: PERSPECTIVES FROM MATHEMATICIANS, MATHEMATICS EDUCATORS, AND STUDENTS

Eun-Jung **Lee*** (1), Kyeong-Hwa **Lee** (2), Min-Sun **Park** (2)
(1: Korea Foundation for the Advancement of Science & Creativity; 2: Seoul National University)
**DEVELOPING PRE-SERVICE TEACHERS' ABILITIES TO NOTICE INQUIRY OPPORTUNITIES
IN MATHEMATICAL TASKS**

Meltem **Koçak***, Yasin **Soylu**
(Atatürk University)
**ANALYSIS OF PROSPECTIVE MATHEMATICS TEACHERS' TEACHING STRATEGY
KNOWLEDGE ON GEOMETRIC FORMULAS**

TSG 49 – In-service education and professional development of primary mathematics teachers

Co-chairs: Akihiko **Takahashi** (USA), Leonor **Varas** (Chile)
Team members: Toshiakira **Fuji** (Japan), Kim **Ramatlapana** (Botswana), Christoph **Selter** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00
Location: G: green, Social Science Building, room B130

Session Chair: Leonor **Varas**
Presentations: Hatice Aydan **Kaplan***, Ziya **Argun**
(Gazi University)
**KNOWLEDGE FOR DIAGNOSING STUDENT THINKING:
HOW IT AFFECTS DIAGNOSTIC COMPETENCE?**

Zetra Hainul **Putra*** (1,2)
(1: Faculty of Teacher Training and Education; 2: Department of Science Education)
**EVALUATION OF ELEMENTARY TEACHERS' KNOWLEDGE ON FRACTION MULTIPLICATION
USING ANTHROPOLOGICAL THEORY OF THE DIDACTIC**

Dichen **Wang***
(The Hong Kong Institute of Education)
PROBING INTO THE WAYS TEACHERS LEARN MATHEMATICS AND ITS TEACHING

Lynda J. **McCoy***
(California State University Long Beach)
**AN EXPERIENTIAL LEARNING APPROACH TO DEVELOPING IN-SERVICE ELEMENTARY
TEACHERS' CONTENT KNOWLEDGE FOR TEACHING MATHEMAT**

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: G: green, Social Science Building, room B130

Session Chair: Toshiakira **Fujii**
Presentations: April Dawn **Strom** (1), Patrick **Kimani*** (2), Laura **Watkins** (2)
(1: Scottsdale Community College; 2: Glendale Community College)
**AMPING UP PROFESSIONAL DEVELOPMENT THROUGH A COLLABORATIVE
COMMUNITY OF LEARNERS (CCOL)**

Kalaivani **Shanmugam*** (1), Lim Chap **Sam** (2), Md **Razhi** (1)
(1: Institut Pendidikan Guru Kampus Tuanku Bainun; 2: Universiti Sains Malaysia)
**INSIGHTS OF LESSON STUDY PROCESS FROM MALAYSIAN
MATHEMATICS TEACHERS: A CASE STUDY**





Nor Azura **Abdullah***, Frederick K. S. **Leung**

(The University of Hong Kong)

HIGHLIGHTING TEACHER'S VALUES IN TEACHING PRIMARY SCHOOL MATHEMATICS DURING LESSON STUDY PROCESS

Thandiwe Lillian **Hlam***

(NMMU)

A TEACHER COLLECTIVE AS A PROFESSIONAL DEVELOPMENT APPROACH TO PROMOTE FOUNDATION PHASE MATHEMATICS TEACHING

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: G: green, Social Science Building, room B130

Session Chair: Christoph **Selter**

Presentations: Luise **Eichholz***

(TU Dortmund)

"MATHE KOMPAKT" – DESIGN AND EVALUATION OF AN IN-SERVICE COURSE FOR OUT-OF-FIELD MATHEMATIC TEACHERS

Gabriela Gomez **Pasquali***

(OMAPA)

THE IMPACT OF THE MATHEMATIC OLYMPIADS IN PARAGUAYAN TEACHERS

Calvin Zakaria **Swai*** (1), Andrew L. **Binde** (2)

(1: University of Dodoma; 2: University of Dodoma)

A STUDY OF PRIMARY SCHOOL TEACHERS' BELIEFS OF PEDAGOGICAL STRATEGIES IN MATHEMATICS LESSONS IN TANZANIA

James Dogbey*

(Texas A & M University – Corpus Christi)

REFORMING ELEMENTARY SCHOOL MATHEMATICS INSTRUCTION THROUGH CLASSROOM DISCOURSE AND COOPERATIVE LEARNING

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00

Location: G: green, Social Science Building, room B130

Session Chair: Kim **Ramatlapana**

Presentations: Monica Smith **Karunakaran** (2), Anne Elizabeth **Adams*** (1),

Brittany **Wnek** (1), Veronica **Blackham** (1), Peter **Klosterman** (2), Libby **Knott** (2), Rob **Ely** (1)

(1: University of Idaho; 2: Washington State University)

MAKING MATHEMATICAL REASONING EXPLICIT: RESPONSIVE PD

Jutta Cornelia **Reuwsaat Justo***, Kelly **da Silva Rebelo**, Margarete Fátima **Borga**,

Janaína **Freitas dos Santos**, Simone **Soares Echeveste**

(Universidade Luterana do Brasil)

IN-SERVICE EDUCATION OF PRIMARY MATHEMATICS TEACHERS WITH FOCUS ON PROBLEM SOLVING

Samantha **Quiroz Rivera*** (1), Elizenda **Castañeda** (2), Ruth **Rodríguez** (2)

(1: Universidad Autónoma de Nuevo León; 2: Tecnológico de Monterrey)

LESS THEORY AND MORE PRACTICE: HOW TO DESIGN A LESSON BASED IN MATHEMATICAL MODELING?

Marc **Husband***, Tina **Rapke**, Robyn **Ruttenberg-Rozen**
(York University)

"YES, AND...": CONCEPTUALIZING AND CHARACTERIZING AUTHORITY AS FLUID
IN PROFESSIONAL LEARNING COMMUNITIES

TSG 50 – In-service education, and professional development of secondary mathematics teachers

Co-chairs: Jill **Adler** (South Africa), Yudong **Yang** (China)

Team members: Hilda **Borko** (USA), Konrad **Krainer** (Austria), Sitti **Patahuddin** (Australia)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: D: yellow, West Wing Building, room 122

Group A – Session Chair: Jill **Adler**

Presentations: Erin C. **Henrick*** (1), Emily C. **Kern** (1), Paul **Cobb** (1), Thomas M. **Smith** (2), Yiming **Cao** (3)
(1: Vanderbilt University; 2: University of California-Riverside; 3: Beijing Normal University)

DISTRICT AND SCHOOL SUPPORTS FOR AMBITIOUS MATH INSTRUCTION:
A DESCRIPTIVE COMPARISON BETWEEN THE U.S. AND CHINA

Malin **Lindwall Ehrnlund***

(Linköping University)

MATHEMATICS TEACHERS USING CONCERNS AND NEEDS INFORMED BY
PRACTICE AS A LEVER FOR CHANGE

Marlon Casimiro **Ebaeguin***, Max **Stephens**

(The University of Melbourne)

GOING BEYOND COPYISM: A CULTURALLY EMBEDDED IMPLEMENTATION
OF LESSON STUDY IN THE PHILIPPINES

Pınar **Güner*** (1), Didem **Akyüz** (2)

(1: Istanbul University; 2: Middle East Technical University)

INVESTIGATING THE CONSISTENCY BETWEEN PLANNED AND IMPLEMENTED
LESSONS IN THE CONTEXT OF LESSON STUDY

Location: D: yellow, West Wing Building, room 220

Group B – Session Chair: Yudong **Yang**

Presentations: Thomas **Wassong***

(University Paderborn)

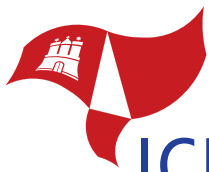
MATHEMATICS TEACHERS EDUCATORS' BELIEFS ABOUT THE ROLE OF
CONTENT KNOWLEDGE IN CPD-COURSES

Catherine **Paolucci*** (1), Maire Ni **Riordain** (2)

(1: State University of New York at New Paltz; 2: National University of Ireland)

TEACHER DEVELOPMENT WITHIN A PROFESSIONAL DEVELOPMENT
PROGRAMME FOR OUT-OF-FIELD MATHEMATICS TEACHERS





Sebastian **Kuntze***, Marita **Friesen**

(Ludwigsburg University of Education)

USING SITUATED FORMATS FOR RESEARCH INTO ASPECTS OF
MATHEMATICS TEACHER EXPERTISE – PROSPECTS AND CHALLENGES

Terry Wan Jung **Lin*** (1), Kara **Jackson** (2), Marta **Kobiela** (1), Zachary **Parker** (1)

(1: McGill University; 2: University of Washington)

DEVELOPING FACILITATION PRACTICES TO SUPPORT SECONDARY MATHEMATICS
TEACHER LEARNING

Location: D: yellow, West Wing Building, room 222

Group C – Session Chair: Hilda **Borko**

Presentations: Mayra Anaharely Sarai **Báez Melendres***, Rosa María **Farfán Márquez**

(Center for Research and Advanced Studies of the National Polytechnic Institute)

REFLECTING ON SCHOOL MATHEMATICS: A SOCIOEPISTEMOLOGICAL ROUTE

Firdevs Iclal **Karatas*** (1), Fatma **Tutak** (2)

(1: Middle East Technical University; 2: Bogazici University)

EXAMINING TURKISH SECONDARY MATHEMATICS TEACHERS' TECHNOLOGICAL
PEDAGOGICAL CONTENT KNOWLEDGE

Fiona **Faulkner*** (1), Ciara **Lane** (2), Aoife **Smith** (2)

(1: Dublin Institute of Technology; 2: University of Limerick)

A CPD PROGRAMME FOR OUT-OF-FIELD MATHEMATICS TEACHERS IN IRELAND:
PROGRAMME OUTLINE AND INITIAL EVALUATIONS

Bingxing **Shi***, Fei **Zhang**, Zhaoyun **Hu**, Yonghui **Wang**, Jingling **Gu**, Wei **Cheng**

(Beijing Normal University)

INQUIRY INTO THE STRATEGY OF TEACHER'S PROFESSIONAL DEVELOPMENT

Location: D: yellow, West Wing Building, room 223

Group D – Session Chair: Konrad **Krainer**

Presentations: Vanessa **Crecci***, Dario **Fiorentini**

(University of Campinas)

PROFESSIONAL DEVELOPMENT WITHIN A BORDERLAND COMMUNITY

Ka Lok **Wong***

(The University of Hong Kong)

BRINGING RICH TASKS TO THE MATHEMATICS CLASSROOMS IN HONG KONG:
OPPORTUNITIES AND POTHOLES IN PROFESSIONAL DEVELOPMENT

Owen Hugh **Glover***

(Nelson Mandela Metropolitan University)

CRITERIA FOR DETERMINING MATHEMATICAL KNOWLEDGE IN A HIGH
SCHOOLTEACHER EDUCATION PROGRAM – AN AUTO-BIOGRAPHICAL ACCOUNT

Aleksandra Anna **Kaplon-Schilis*** (1), Irina **Lyublinskaya** (2)

(1: The Graduate Center; 2: College of Staten Island)

DEVELOPING ESSENTIAL UNDERSTANDINGS OF MATHEMATICS FOR
MIDDLE SCHOOL TEACHERS THROUGH ANALYSIS OF STUDENT MISCONCEPTIONS

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00
Location: D: yellow, West Wing Building, room 122

Group A – Session Chair: Sitti **Patahuddin**

Presentations: Rongjin **Huang**, Angela T. **Barlow**, Melaine **Haupt***
(Middle Tennessee State University)

DEVELOPING HIGH-LEVERAGE PRACTICES AS DELIBERATE PRACTICE THROUGH LESSON STUDY

Theodosia **Prodromou***
(UNE)

MICRO- AND MACRO-LEVELS OF MATHEMATICAL COMPLEXITIES WHEN
DECOMPRESSING AND TRIMMING MATHEMATICAL KNOWLEDGE WITH THE USE

Katja **Maass*** (1), Malcolm **Swan** (2), Anna-Maria **Aldorf** (1)
(1: University of education Freiburg; 2: University of Nottingham)

PROFESSIONAL DEVELOPMENT FOR INQUIRY-BASED LEARNING:
INTERACTIONS BETWEEN BELIEFS, PRACTICES AND CLASSROOM CONTEXTS

Lyn **Webb***

(Nelson Mandela Metropolitan University)

CHANGING MATHEMATICAL MINDSETS THROUGH NUMBER TALKS:
A CASE STUDY WITH IN-SERVICE TEACHERS IN SOUTH AFRICA

Enriqueta **Reston***

(University of San Carlos)

A NEEDS-BASED TEACHER DEVELOPMENT PROGRAM FOR INSERVICE TEACHERS:
TOWARDS IMPLEMENTING A SPIRAL MATHEMATICS CURRICULUM

Deependra **Budhathoki***, Binod Prasad **Pant**, Pundary **Phuyal**
(Kathmandu University)

APPRECIATIVE PEDAGOGY IN NEPALESE MATHEMATICS CLASSROOM

Location: D: yellow, West Wing Building, room 223

Group B – Session Chair: Yudong **Yang**

Presentations: Rebekah **Elliott***, Wendy Rose **Aaron**
(Oregon State University)

IMPROVING PRACTICE USING A MODEL OF TEACHER PROFESSIONAL DEVELOPMENT

Nanette Marie **Seago*** (1), Karen **Koellner** (2), Jennifer **Jacobs** (3)
(1: WestEd; 2: Hunter College; 3: University of Colorado)

PREPARING TO FACILITATE MATHEMATICS PROFESSIONAL DEVELOPMENT:
AIMING FOR ALIGNMENT BETWEEN THE PROGRAM AND THE FACILITAT

Stephen **Lee***, Bernard **Murphy**, Charlie **Stripp**

(Mathematics in Education and Industry)

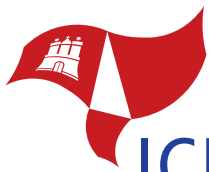
PROFESSIONAL DEVELOPMENT OF MATHEMATICS TEACHERS:
ADDRESSING THE CHALLENGES OF SUSTAINABILITY AND SCALABILITY

Edith **Schneider***

(University of Klagenfurt)

“PEDAGOGY AND SUBJECT DIDACTICS – MATHEMATICS” –
A TWO YEAR PROFESSIONAL PROGRAMME FOR TEACHERS





Mette **Andresen***

(University of Bergen)

A RESEARCH PROJECT EVALUATED AS A MEANS FOR TEACHERS' PROFESSIONAL DEVELOPMENT

Suanrong **Chen*** (1), Sherry **Herron** (2), Jiu **Ding** (2), Richard **Mohn** (2)

(1: Yangzhou University; 2: The University of Southern Mississippi)

ASSESSING AWARENESS OF FRACTAL GEOMETRY AMONG SECONDARY MATHEMATICS TEACHERS IN THE UNITED STATES AND CHINA

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: D: yellow, West Wing Building, room 220

Group A – Session Chair: Konrad **Kraimer**

Presentations: Fu **Ma***, Xiaomei **Liu**, Fei **Zhang**, Shoufu **Jiang**, Xiaocheng **Li**

(Beijing Normal University)

THE INFLUENCE ON TEACHER BELIEF OF NETWORKED STUDY AIMING AT TEACHERS' PROFESSIONAL DEVELOPMENT

Larissa **Zwetschler*** (1), Kim Alexandra **Rösike** (2), Susanne **Prediger** (2), Bärbel **Barzel** (1)

(1: University Duisburg-Essen; 2: TU Dortmund University)

PROFESSIONAL DEVELOPMENT LEADERS' PRIORITIES OF CONTENT AND THEIR VIEWS ON PARTICIPANT-ORIENTATION

Nielce Meneguelo **Lobo da Costa***, Maria Elisabette Brisola **Brito Prado**

(Universidade Anhanguera de São Paulo)

MATHEMATICS TEACHER EDUCATION AND INVESTIGATIVE TASKS: DEVELOPING THE TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE

Ji-Won **Son***

(University at Buffalo – The State University of New York)

ASSOCIATION BETWEEN TEACHER FEEDBACK AND MATH INSTRUCTION IN JAPAN, KOREA, SINGAPORE, AND THE UNITED STATES

Location: D: yellow, West Wing Building, room 222

Group B – Session Chair: Hilda **Borko**

Presentations: Claudia Lisete Oliveira **Groenwald**, Carmen Teresa **Kaiber**,

Jutta Cornelia **Reuwsaat Justo**, Marlise **Geller***

(Universidade Luterana do Brasil)

SCIENCE AND MATHEMATICS IN-SERVICE TEACHER EDUCATION AIMING THE DEVELOPMENT FOR CITIZENSHIP BEHAVIOR: RESEARCHES FROM OB

Gabriel Rubén **Soto***

(Universidad Nacional de la Patagonia San Juan Bosco)

NETWORK THEORY AND PROFESSIONAL DEVELOPMENT: A CASE STUDY

Zhongru **Li***

(Southwest University)

LEARNING PATHS OF TRIGONOMETRIC FUNCTION BASED ON Q-MATRIX AND CLUSTERING FROM THE PERSPECTIVE OF REMEDIAL TEACHING

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: D: yellow, West Wing Building, room 122

Group A – Session Chair: Sitti **Patahuddin**

Presentations: Maha **Abboud-Blanchard***
(University of Cergy-Pontoise)

MATHEMATICS TEACHER EDUCATORS AND TECHNOLOGY:
DEVELOPING AN APPROPRIATE TRAINING COURSE

Wajeeh **Daher** (1,2), Nimer **Bayaa*** (1), Rawan **Anabousy** (1)

(1: Alqasimi Academic College of Education; 2: An-Najah National University)

PROFESSIONAL DEVELOPMENT SCHOOL AS A CATALYST FOR IN-SERVICE TEACHERS'
INTEGRATION OF ICT

Michael **Besser***, Dominik **Leiss**

(Leuphana University of Lueneburg)

THE EFFECT OF PROFESSIONAL DEVELOPMENT ON TEACHERS' PCK, ON
BELIEFS AND ON THE QUALITY OF TEACHING

Russell **West Jr**, David **Wees***, Jesse **Johnson**

(New Visions for Public Schools)

THREE CHALLENGES IN BUILDING A NETWORK SUPPORTING AMBITIOUS
TEACHING OF SECONDARY MATHEMATICS

Shadrack **Moalosi***

(Naledi Senior Secondary School)

WHAT GETS ENACTED IN OBJECT FOCUSED PROFESSIONAL DEVELOPMENT?

Xiaoqing **Shang***, Xiaoduan **Chen**

(Shaanxi Normal University)

INVESTIGATION THE CONSISTENCY BETWEEN TEACHERS' META-TEACHING
BEHAVIOR AND ITS CONSCIOUSNESS IN CHINA

Location: D: yellow, West Wing Building, room 223

Group B – Session Chair: Konrad **Krainer**

Presentations: Andriceli **Richit*** (1), Rosana Giaretta **Sguerra Miskulin** (2)

(1: Instituto Federal Catarinense – IFC – Campus Concórdia;

2: Universidade Estadual Paulista – UNESP – Campus Rio Claro)

ONLINE COMMUNITY OF PRACTICE AND TPACK: A STRATEGY FOR THE FORMATION
OF HIGHER EDUCATION MATH TEACHER

Thomas **Hahn***, Andreas **Eichler**

(University Kassel)

TEACHERS' MOTIVATION TO THINK STUDENT-CENTRED IN THE CONTEXT OF
PROFESSIONAL DEVELOPMENT

Benita P. **Nel***

(University of the Witwatersrand)

THE USE OF A COMMUNITY OF PRACTICE AS A TOOL TO BREAK THE
ISOLATEDNESS OF SPECIALIST TEACHERS IN RURAL SETTINGS





Ingrid Elizabeth **Mostert*** (1), Marie **Joubert** (2)

(1: African Institute for Mathematical Sciences Schools Enrichment Center;

2: African Institute for Mathematical Sciences Schools Enrichment Center)

DESIGNING AND DEVELOPING MATHEMATICS LESSON PLANS IN A DESIGN RESEARCH PROJECT: WHAT TEACHERS LEARNT

Freyja **Hreinsdóttir***

(University of Iceland)

NORDIC GEOGEBRA NETWORK – A NETWORK FOR LEARNING, EXPERIMENTING AND RESEARCH FOR MATHEMATICS TEACHERS AND RESEARCHERS

Zengcheng **Yue***

(East China Normal University)

ANALYSIS OF JUNIOR MIDDLE SCHOOL MATHEMATICS TEACHERS' PAPERS IN MAINLAND CHINA

TSG 51 – Diversity of theories in mathematics education

Co-chairs: Tommy **Dreyfus** (Israel), Anna **Sierpiska** (Canada)

Team members: Stefan **Halverscheid** (Germany), Steve **Lerman** (UK), Takeshi **Miyakawa** (Japan)

Second Session: Tuesday, 26 July 2016, 16.30 – 18.00

Location: C: turquoise, Main Building, room 118

Session Chair: Tommy **Dreyfus**, Steve **Lerman**

Presentations: Celina **Abar***

(PUC/SP)

MATHEMATICS EDUCATION AND TECHNOLOGICAL INNOVATION

Juan D. **Godino*** (1), Carmen **Batanero** (2), Vicenç **Font** (3),

Ángel **Contreras** (4), Miguel R. **Wilhelmi** (5)

(1: Universidad de Granada; 2: Universidad de Granada; 3: Universidad de Barcelona;

4: Universidad de Jaén; 5: Universidad Pública de Navarra)

THE THEORY OF DIDACTICAL SUITABILITY: NETWORKING A SYSTEM OF DIDACTICS PRINCIPLES FOR MATHEMATICS EDUCATION FROM DIFFERE

Hatice Kubra **Guler*** (1), Cigdem **Arslan** (2)

(1: Uludag University; 2: Istanbul University)

CONSOLIDATING SIMILARITY KNOWLEDGE BY THE HELP OF PYTHAGOREAN THEOREM

Gilmer Jacinto **Peres*** (1), Rúbia Barcelos **Amaral** (2)

(1: Centro Federal de Educação Tecnológica de Minas Gerais – CEFET/MG;

2: Universidade Estadual Paulista – Rio Claro)

PERSPECTIVES FROM BRICOLAGE TO MATHEMATICS EDUCATION

Ridha **Najar***

(Université du Québec en Abitibi-Témiscamingue)

ANTHROPOLOGICAL AND COGNITIVE APPROACHES IN MATHEMATICS EDUCATION – WHAT ARE THE RELATIONSHIPS?

Fourth Session: Friday, 29 July 2016, 16.30 – 18.00
Location: C: turquoise, Main Building, room 118

Session Chairs: Anna **Sierpinska**, Stefan **Halverscheid**

Presentations: José **Vilani Farias*** (1), Denise **Silva Vilela** (2)

(1: Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Norte;

2: Universidade Federal de São Carlos)

THE FIELD OF MATHEMATICS AND THE STRATEGIES OF DISTINCTION FOR
TEACHER TRAINING

Barbara Busisiwe **Goba***, Renuka **Vithal**

(University of KwaZulu-Natal)

RESEARCHING MATHEMATICS EDUCATION IN SOUTH AFRICA:
THEORIES EMPLOYED IN THE POSTGRADUATE STUDIES (1995-2004)

Pedro **Nicolás***

(Universidad de Murcia)

EVOLUTIONARY EPISTEMOLOGY THEORY AND REFERENCE
EPISTEMOLOGICAL MODELS

José David **Zaldívar-Rojas***

(Universidad Autónoma de Coahuila)

WHAT CAN WE LEARN FROM OUR STUDENTS? REFLECTIONS ON THE
USE OF THE GRAPHS IN OUTREACH ACTIVITIES OF SCIENCE

TSG 52 – Empirical methods and methodologies

Co-chairs: David **Clarke** (Australia), Alan **Schoenfeld** (USA)

Team members: Bagele **Chilisa** (Botswana), Paul **Cobb** (USA), Christine **Knipping** (Germany)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 13

Session Chair: David **Clarke**

Presentations: Abigail Fregni **Lins*** (1), Patricia Sandalo **Pereira** (2), Mercedes **Carvalho** (3)

(1: State University of Paraíba UEPB; 2: Federal University of Mato Grosso do Sul UFMS;

3: Federal University of Alagoas UFAL)

COLABORATIVE RESEARCH WORK PROJECT WITH TEACHERS WHO TEACH
MATHEMATICS AT SCHOOL LEVEL IN THE NORTH EAST AND CENTER EAST

Claudia Regina **Flores***

(Federal University of Santa Catarina)

TOWARDS A CRITICAL EDUCATIONAL RESEARCH IN EDUCATION,
MATHEMATICS AND ART





TSG 53 – Philosophy of mathematics education

Co-chairs: Paul **Ernest** (UK), Ladislav **Kvasz** (Czech Republic)

Team members: Maria **Bicudo** (Brazil), Regina **Möller** (Germany), Ole **Skovsmose** (Denmark/Brazil)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: B: dark-brown, East Wing Building, room 120

Session Chair: Ole **Skovsmose**

Presentations: Jessica **Kunstler***

(University of Cologne)

USING FAMILY RESEMBLANCES FOR ELABORATING MATHEMATICAL RULES

Colin **Jackson*** (1), Hilary **Povey** (1), Gill **Adams** (1), Emanuela **Ughi** (2)

(1: Sheffield Hallam University; 2: University of Perugia)

THE ROLE OF EXHIBITIONS BY CHILDREN IN MAKING MATHEMATICS

Durga Prasad **Dhakal***

(Kathmandu University)

PHILOSOPHY OF MATHEMATICS AND ITS RELEVANCE IN MATHS CLASSROOM

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: B: dark-brown, East Wing Building, room 120

Session Chair: Paul **Ernest**

Presentations: Bronislaw **Czarnocha***

(City University of New York)

OCKHAM RAZOR OF THE CREATIVITY RESEARCH IN MATHEMATICS EDUCATION

Karla Viviana **Sepúlveda Obreque*** (1,2), Javier **Lezama Andalon** (2)

(1: Universidad Católica de Temuco; 2: Instituto Politécnico Nacional de México)

EPISTEMOLOGY OF TEACHERS ABOUT THE MATHEMATICAL KNOWLEDGE:
A SOCIO EPISTEMOLOGICAL STUDY

Allan **Tarp***

(MATHeCADEMY.net)

FROM ESSENCE TO EXISTENCE IN MATHEMATICS EDUCATION

TSG 54 – Semiotics in mathematics education

Co-chairs: Norma **Presmeg** (USA), Luis **Radford** (Canada)

Team members: Gert **Kadunz** (Austria), Luis **Puig** (Spain), Wolff-Michael **Roth** (Canada)

First Session: Tuesday, 26 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 1+2

Session Chair: Norma **Presmeg**

Presentations: Jesus Victoria Flores **Salazar*** (1), Katia Vigo **Ingar** (2)

(1: Pontificia Universidad Catolica del Peru; 2: Pontificia Universidad Catolica del Peru)

FIGURAL AND GRAPHIC REPRESENTATION IN DGE AND CAS

José Luis **López Hernández***, José **Guzmán Hernández**

(Center of Research and Advanced Studies)

ARTIFACTS AND GESTURES IN THE PROCESS OF OBJECTIFICATION OF THE
CONCEPT OF VARIATION

Uta **Priss***

(Ostfalia University)

A SEMIOTIC-CONCEPTUAL ANALYSIS OF CONCEPTUAL DEVELOPMENT IN
LEARNING MATHEMATICS

Daniela **Behrens***

(Universität Bremen)

BUNDLING AND DE-BUNDLING BY DRAGGING: FROM ACTING TO GESTURING

Third Session: Friday, 29 July 2016, 15.00 – 16.00

Location: K: purple, Law Building, room 1+2

Session Chair: Luis **Radford**

Presentations: Gloria Inés Neira **Sanabria***

(Universidad distrital francisco jose de caldas)

REPRESENTACIONES, LENGUAJE, SÍMBOLOS, SEMIÓTICA, NARRATIVAS
SIMBÓLICAS VS. COMPRENSION EN MATEMATICAS

Nicole Engelke **Infante***

(West Virginia University)

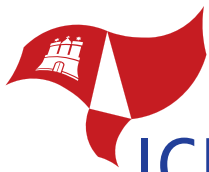
HIGHLIGHTING KEY LINKS THROUGH GESTURE: A CASE STUDY OF
THE SECOND DERIVATIVE TEST

Anna **Shvarts***, Anatoly **Krichevets**

(Lomonosov Moscow State University)

DUAL EYE-TRACKING AS A METHOD TO INVESTIGATE THE ACQUIRING OF
THEORETICAL PERCEPTION OF VISUAL REPRESENTATIONS





Poster

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 1 – Early childhood mathematics education (up to age 7)

Simone **Dunekacke*** (1), Katja **Eilerts** (2), Lars **Jenßen** (3)

1: IPN Kiel; 2: Humboldt-Universität zu Berlin; 3: Freie Universität Berlin

RELATIONS OF AFFECTIVE, COGNITIVE AND SITUATIONSSPECIFIC FACETS OF PRESCHOOL TEACHERS PROFESSIONAL COMPETENCE

Nosisi **Feza*** (1), Noludwe **Bambiso** (2)

1: University of South Africa; 2: Forthare University

SOUTH AFRICA'S EDUCATORS' MATHEMATICS TEACHING JOURNEY: A CASE OF 5–6 YEAR OLD EDUCATOR PRACTISES

Lina **Fonseca***

Instituto Politécnico de Viana do Castelo

MATHEMATICS IN EARLY YEARS: SOLVING PROCESS PROBLEMS IN KINDERGARTEN

Ryan **Nivens**, Rosemary **Geiken***

East Tennessee State University

USING A COMPUTER SCIENCE-BASED BOARD GAME TO DEVELOP PRESCHOOLERS' MATHEMATICS

Manabu **Goto***

Sagami Women's university

REFORM OF THE KINDERGARTEN TEACHERS AND CHILD CARE WORKERS IN DAY-CARE CENTER TRAINING CURRICULUM IN JAPAN

Esther **Henschen***

University of Education (Pädagogische Hochschule)

MATHEMATICAL CONTENT OF PLAY ACTIVITIES IN KINDERGARTEN, EXAMPLIFIED ON BLOCKPLAY ACTIVITIES

Kam Ling **Lao***

Open University of Hong Kong

COMPARISON OF THREE EARLY CHILDHOOD CURRICULA FROM THE PERSPECTIVE OF MATHEMATICS EDUCATION

Ana Belén **Sánchez García**, M^a Consuelo Monterrubio **Pérez***, Elena Ramírez **Orellana**, Jorge Martín **Domínguez**

University of Salamanca

CATEGORY ANALYSIS SYSTEM FOR THE EDUCATIONAL PRACTICE WITH ICTS RESOURCES IN EARLY CHILDHOOD EDUCATION

Anne **Nakken*** (1), Yvonne **Grimeland** (2), Beate **Nergård** (2), Oliver **Thiel** (2)

1: Norwegian Centre for Mathematics Education; 2: Queen Maud University College

YOUNG CHILDREN'S PLAY IN A MATHEMATICS ROOM

Dee Jean **Ong***

REAL Education Group Sdn Bhd

SIMPLE AUGMENTED REALITY (AR) FOR EARLY CHILDHOOD MATHEMATICS

Edita **Partová*** (1), Katarína **Žilková** (2)

1: Comenius University in Bratislava Faculty of Education Slovakia; 2: Catholic University in Ružomberok Faculty of Education; 2: Catholic University in Ružomberok Faculty of Education

DEVELOPMENT OF CHILDREN S ABILITY TO RECOGNIZE GEOMETRIC SHAPES THROUGH PATTERNS

Katja **Eilerts**, Lars **Jenßen**, Michael **Eid**, Corinna **Schmude**, Thomas **Koinzer**, Sigrid **Blömeke**, Julia **Rasche***
Humboldt-Universität zu Berlin

PRO-KOMMA: EFFECTIVENESS OF PRESCHOOL TEACHER EDUCATION IN THE FIELD OF MATHEMATICS

Simeon **Schlicht***

University of Cologne

ABOUT THE DEVELOPMENT OF CONCEPTS OF SETS AND NUMBERS – A QUALITATIVE CASE STUDY WITH 3- TO 4-YEAR-OLDS

Seanyelle **Yagi***

University of Hawaii

AN EXPLORATION OF FIRST GRADE STUDENTS' ENGAGEMENT IN MATHEMATICAL PROCESSES DURING WHOLE GROUP DISCUSSIONS

Jennifer **Young-Loveridge***, Brenda **Bicknell**

University of Waikato

TENS AWARENESS: A FRAMEWORK FOR EARLY PLACE VALUE LEARNING

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 2 – Mathematics education at tertiary level

Mike **Altieri*** (University of Dortmund)

PROCEDURAL KNOWLEDGE AS A PREDICTOR FOR SUCCESS IN GERMAN MATH EXAMS FOR FIRST YEAR ENGINEERING STUDENTS

Mary **Beisiegel*** (Oregon State University)

MATHEMATICS GRADUATE TEACHING ASSISTANTS' LONGITUDINAL TRANSITIONS IN BELIEFS ABOUT MATHEMATICS TEACHING AND LEARNING

Luis Weng **San**, Bhangy **Cassy*** (University Eduardo Mondlane – UEM)

ALGEBRAIC THINKING IN THE UNDERSTANDING AND SOLUTION OF GEOMETRIC PROBLEMS AMONG 1ST YEAR UNIVERSITY STUDENTS

Chris **Rasmussen** (1), Jess **Ellis*** (2)

1: San Diego State University; 2: Colorado State University

RESULTS OF US NATIONAL STUDY ON CALCULUS

Yael **Fleischmann***, Alexander **Börsch**, Rolf Biehler, Christoph **Colberg**, Tobias **Mai**

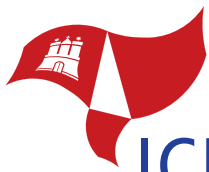
University of Paderborn

STUDIFINDER: MATHEMATICAL E-LEARNING MATERIALS FOR THE TRANSITION FROM SECONDARY SCHOOL TO UNIVERSITY

Alfonso J. **González-Regaña***, Verónica **Martín-Molina**, José María **Gavilán-Izquierdo**

Universidad de Sevilla

CONCEPT AND APPLICATION OF MATHEMATIZING TO THE PROCESS OF CLASSIFICATION



Roland **Gunesch***

PH Vorarlberg

HOW, WHEN, WHERE AND WHY DO STUDENTS USE LECTURE RECORDINGS?

Mathias **Hattermann*** (1), Alexander **Salle** (2), Stefanie **Schumacher** (2), Daniel **Heinrich** (1)

1: Paderborn University; 2: Osnabrück University

DIGITAL MEDIA AS MOTIVATING TOOL FOR LEARNING DESCRIPTIVE STATISTICS

Marios **Ioannou***

University of the West of England – Alexander College

A COMMUNICATIVE PERSPECTIVE ON STUDENTS' ENGAGEMENT WITH THE CONCEPT OF GROUP: THE CASE OF STUDENTS F AND M

Seong-A **Kim*** (1), Jeong-Gyoo **Kim** (2), Sunhee **Lee** (3)

1: Dongguk University; 2: Seoul National University of Science and Technology;

3: Ewha Womans University

STUDENTS' PERCEPTION OF GROUP DISCUSSIONS AND PRESENTATIONS IN A MATH EDUCATION COURSE

Heather **Lonsdale*** (1), Deborah **King** (2)

1: Curtin University; 2: The University of Melbourne

PERCEPTION VS REALITY: USING TUTORIAL VIDEOS TO AID TUTOR REFLECTION

Carolyn **Masserang***

The University of Michigan

A COMPARATIVE ANALYSIS OF THREE COMPREHENSIVE INITIATIVES TO REDESIGN DEVELOPMENTAL MATHEMATICS COLLEGE CURRICULUM

Anthony **Morphett***

University of Melbourne

SUPPORTING INTERNALISATION OF MATHEMATICAL SYNTAX USING BLOCKS

Philip **Walker** (1), Eabhnat Ní **Fhloinn*** (2)

1: University of Leeds; 2: Dublin City University

REVISION ACTIVITIES OF UNDERGRADUATE MATHEMATICS STUDENTS

Pierre-Vincent **Quéré*** (1,2), Ghislaine **Gueudet** (2,3)

1: UBO; 2: CREAD; 3: ESPE Bretagne

AUTONOMY IN MATHEMATICS IN THE SECONDARY-TERTIARY TRANSITION

Kristina **Raen***

University of Agder

MATHEMATICAL COMPETENCIES VISIBLE THROUGH ASSESSMENT FOR ENGINEERING STUDENTS

Johanna **Rämö***, Juulia **Lahdenperä**, Susanna **Oksanen**

University of Helsinki

UNIVERSITY TEACHING ASSISTANTS' TEACHING RELATED BELIEFS

Ingolf **Schäfer***

University of Bremen

BREMATH – REDESIGN AND IMPLEMENTATION OF UNIVERSITY MATHS COURSES FOR FUTURE HIGH SCHOOL TEACHERS

Karsten **Schmidt***

Technical University of Denmark

ASSIGNMENTS AND WRITTEN EXAMS IN AN ICT LEARNING ENVIRONMENT

Thomas **Stenzel***

University of Duisburg-Essen

EXPLICATING STRATEGIES – PLANNING AN INTERVENTION TO INCREASE THE STRATEGIC KNOWLEDGE OF UNIVERSITY FRESHMEN

Gero **Stoffels***

University of Siegen

DESCRIPTION AND INITIAL RESULTS OF THE PRESERVICE TEACHERS SEMINAR "ÜBERPRO-WAHRSCHEINLICHKEITSRECHNUNG"

Sophie **Stuhlmann***

University of Hamburg

ARTIN'S BRAID GROUP AS AN INTRODUCTORY EXAMPLE FOR GROUP THEORY APPROACHES AT THE UNIVERSITY OF HAMBURG

Athina **Thoma***

University of East Anglia

LECTURERS' PEDAGOGICAL ROUTINES AND EXPECTATIONS ON STUDENTS' ENGAGEMENT IN CLOSED-BOOK EXAMINATIONS

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 4 – Activities for, and research on, mathematically gifted students

Rafael **Ramirez** (1), M Jose **Beltran** (2), Adela **Jaime** (2), Angel **Gutierrez*** (2)

1: University of Granada; 2: University of Valencia

COOPERATIVE LEARNING OF GIFTED STUDENTS IN A VIDEO CALL MATHEMATICS ENVIRONMENT

Ulla Inkeri **Heddewig***

Universität Hamburg

ABOUT THE DEVELOPMENT OF METACOGNITIVE COMPETENCIES OF MATHEMATICALLY GIFTED PRIMARY GRADE STUDENTS

Kioko **Kakihana***

TSUKUBA GAKUIN UNIVERSITY

A CHANCE TO FIND AND CULTIVATE PROMISED STUDENTS

Bulent **Kaygin*** (1), Ayfer **Budak** (2), Ibrahim **Budak** (1)

1: Erzincan University; 2: Dumlupinar University

EXAMINING SELF-REGULATED LEARNING (SRL) SKILLS OF MATHEMATICALLY GIFTED STUDENTS DURING PROJECT DEVELOPMENT

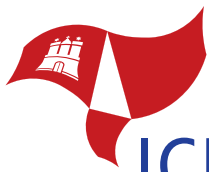
Yuwen **Li*** (1), LianBang **Li** (2), Bing **Wang** (3), Min **Du** (3), Pinhua **Yin** (2), Shengjie **Fan** (4)

1: Mathematics Education Research Institute; 2: Dezhou Department of Education;

3: Dezhou Changhe Elementary School; 4: Dezhou Tianqu Central Elementary School

EXPERIMENTAL STUDY ON INTELLECTUAL DEVELOPMENT IN ELEMENTARY SCHOOL STUDENT





Dimakatso Agnes **Mohokare***

Central University of Technology

TEACHING MATHEMATICALLY GIFTED LEARNERS IN REGULAR CLASSROOMS
IN SOUTH AFRICA

Steffen **Overgaard***, Pia **Tonnesen**, Peter **Weng**

Metropolitan University College

TEACHERS' CHARACTERIZATION OF HIGH ACHIEVING STUDENTS IN MATHEMATICS

Inge **Schwank***

University of Cologne

ON THE BENEFITS OF FUNCTIONAL-LOGICAL THINKING IN MATHEMATICALLY GIFTED
PRIMARY SCHOOL CHILDREN

Moritz **Zehnder***

Universität Bayreuth

MATHEMATICAL GIFTEDNESS AND ITS IDENTIFICATION IN SECONDARY SCHOOL

**Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 5 – Activities for, and research on, students with special needs**

Anna-Sophia **Bock***

University of Hamburg

PREPARING PROSPECTIVE MATHEMATICS TEACHERS FOR INCLUSIVE CLASSES

Heidie **Clemens*** (1), Lena **Lindenskov** (2)

1: VIA University College; 2: Aarhus University

TEACHERS' BELIEFS ABOUT LEARNING DIFFICULTIES

M. Consuelo **Monterrubio**, Laura **Delgado***, M. Carmen **López**

University of Salamanca

TRAINING FUTURE MATHEMATICS SECONDARY TEACHERS: WORKING IN A CLASSROOM
WITH SPECIAL EDUCATIONAL NEEDS STUDENTS

Hokyoung **Ko** (1), Hwanchul **Lee** (2), EunJeng **Lee** (2), Jihye **Ee*** (3)

1: Ajou university; 2: Korea Foundation for the Advancement of Science & Creativity;

3: Graduation of Ajou University; 3: Graduation of Ajou University

A RESEARCH ON THE ACTUAL CONDITION AND IMPROVEMENT OF MATHEMATICS
LEARNING FOR KOREAN STUDENTS

Akira **Morimoto***

Fukushima University

PROMOTING MATHEMATICAL DISCOURSE IN CLASSROOMS FOR THE DEAF

Anna **Noll***, Jürgen **Roth**, Markus **Scholz**

University Koblenz-Landau

HOW TO DESIGN EDUCATIONAL MATERIAL FOR INCLUSIVE CLASSES

Andrea **Peter-Koop***, Rottmann **Thomas**

Bielefeld University

CHILDREN WITH SPECIAL NEEDS UN LEARNING MATHEMATICS: INTRODUCING A REVISED
CONCEPTUAL MODEL FOR INTERVENTION

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 7 – Popularization of mathematics

Mohammad **Bahrami*** (1), Masture **Heydari** (2)
 1: Shahid Beheshti University of Iran; 2: Shahid Rajaei Teacher Training University
DESIGNING ACTIVITIES FOR POPULARIZATION OF MATHEMATICS IN IRAN

Emmanuelle **Forgeoux*** (1,3,4), Axelle **Faughn** (2)
 1: Lycee Victor et Helene Basch; 2: Western California University; 3: IREM de Rennes;
 4: Commission nationale Inter-IREM Lycée
MATHEMATICAL SELFIES – VISUALIZING MATHEMATICS WITH PHOTOGRAPHS

Juan J. **Moreno-Balcázar***, Isabel **Ortiz**, Fernando **Reche**
 University of Almería
A NINE-YEAR EXPERIENCE OF PROMOTION OF MATHEMATICS

Jacinto Eloy **Puig Portal***
 Los Andes University
IN THE FOOTSTEPS OF M. C. ESCHER

Veronica Philemon **Sarungi***
 Aga Khan University
PRE-PI DAY: PROMOTING MATHEMATICS FOR ALL

Aviva **Szpirglas***
 Université de Poitiers
MATH EN JEANS

Brandy **Wieggers*** (1), Diana **White** (2)
 1: Central Washington University; 2: University of Colorado Denver
**UNITED STATES OF AMERICA MATH CIRCLES, VERTICALLY-INTEGRATED INFORMAL
 MATHEMATICAL COMMUNITIES**

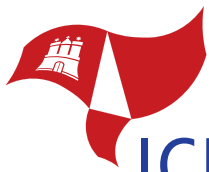
Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 8 – Teaching and learning of arithmetic and number systems (focus on primary education)

Yan-Hong **Chen***
 Bureau of Education
**A PICTURE BOOK FOR INTEGRATING CHILDREN'S LITERATURE, MATHEMATICS CULTURE
 AND LEARNING THEORY**

Yen Ting **Chen***, Juei Hsin **Wang**
 National Taichung University
**A COMPARISON OF TWO ELEMENTARY SCHOOL TEACHER MATH PEDAGOGICAL
 CONTENT KNOWLEDGE**

Rakotondrajao **Fanja***
 University of Antananarivo
HOW MALAGASY PEOPLE DID ARITHMETIC?





Doris **Jeannotte*** (1), Claudia **Corriveau** (2)

1: UQAM; 2: Université Laval

REASONING AND INTERVENTION IN ARITHMETIC ACTIVITIES: FOCUS ON MANIPULATIVES

Sabrina **Lübke***

TU Dortmund University

COMPUTATIONAL ESTIMATION – INFORMAL STRATEGIES

Sergio **Martínez-Juste*** (1), Jose M. **Muñoz-Escolano** (1), Antonio M. **Oller-Marcén** (2)

1: Universidad de Zaragoza; 2: Centro Universitario de la Defensa de Zaragoza

PROPORTIONAL DISTRIBUTION PROBLEMS: STRATEGIES OF THE STUDENTS BEFORE RECEIVING FORMAL INSTRUCTION

Maria de Fatima **Mendes*** (1), Catarina Raquel **Delgado** (1), Joana Maria **Brocardo** (1),

Jean-Marie **Kraemer** (2)

1: Escola Superior de Educação do Instituto Politécnico de Setúbal; 2: CITO

FLEXIBILITY IN MENTAL CALCULATION

Jatuporn **Nasinsroy***, Narumon **Changsri**, Maitree **Inprasitha**

Khon Kaen University

STUDENTS' MATHEMATICAL THINKING ON MULTIPLICATION IN CLASSROOM USING LESSON STUDY AND OPEN APPROACH

Sandra **Magina**, Eurivalda Ribeiro dos Santos **Santana***, Irene **Cazorla**

Universidade Estadual de Santa Cruz

SIMPLE PROPORTION ONE TO MANY AND MANY TO MANY: WHY SO DIFFERENT BEHAVIOUR AMONG 5TH GRADE STUDENTS?

Aya **Steiner***

Haifa University

DEVELOPMENT OF THE DISCOURSE OF RATIONAL NUMBERS

Pernille Bødtker **Sunde***

Aarhus University

DEVELOPMENTAL PATHWAYS OF STRATEGIES IN ADDITION

Leonardo **Uribe***, Walter F. **Castro**, Jhony Alexander **Villa-Ochoa**

Universidad de Antioquia

RELATIONSHIPS BETWEEN SPATIAL AND ARITHMETICAL ABILITIES: A CASE STUDY WITH THIRD GRADERS

Jialu **Wang***

East China Normal University

HOW TO CONSTRUCT A LEARNING SPACE BASED ON THE CONCEPT OF FRACTIONS

Wenbin **Xu***

Nanjing Normal University

IF THE ANSWER IS NOT UNIQUE, THEN WHICH SOLUTION IS CORRECT?

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 10 – Teaching and learning of early algebra

Sunti **Bunlang*** (1), Maitree **Inprasitha** (2), Sampan **Thinwiangthong** (3)
 1: Ph.D student; 2: Center for Research in Mathematics Education; 3: Faculty of Education
 ACTIVITY THEORY FOR MEDIATION IN CLASSROOM USING LESSON STUDY AND OPEN APPROACH

Ali Riza **Kupcu** (1), Hatice Nur **Erbay*** (2)
 1: Marmara University; 2: Istanbul University
 PATTERNS TO ALGEBRAIC THINKING

Shajahan **Haja-Becker***
 University of Trier
 MIDDLE SCHOOL GIRLS' RESPONSES TO SQUARE ROOT TASKS

Tadayuki **Kishimoto***
 University of Toyama
 CLASSIFICATION OF MISCONCEPTIONS OF OPERATIONS WITH NEGATIVE ON NUMBER LINE

Rhett Anthony Cabahug **Latonio*** (1), Catherine **Vistro Yu** (2)
 1: Sotero B. Cabahug FORUM for Literacy; 2: Ateneo de Manila University
 ALIGNMENT OF INSTRUCTION METHODS USED IN TEACHING SIMILAR ARITHMETIC AND ALGEBRA CONCEPTS

Yujin **Lee***
 Korea National University of Education
 AN ANALYSIS OF YOUNG STUDENTS' FUNCTIONAL THINKING ACCORDING TO THE ORDER OF TASK TYPES

Antonio **Moreno**, María C. **Cañadas**, Aurora del **Río**, Marta **Molina***, María de la Sierra **Morillo**
 Universidad de Granada
 THIRD GRADERS' STRATEGIES WHEN SOLVING A FUNCTIONAL THINKING PROBLEM

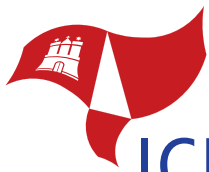
Mara **Otten*** (1), Marja Van den **Heuvel-Panhuizen** (1), Michiel **Veldhuis** (1), Aiso **Heinze** (2)
 1: Utrecht University; 2: IPN – Leibniz Institute for Science
 A PILOT STUDY ON TEACHING EARLY ALGEBRA

Eunseo **Yoo***
 Korea National University of Education
 STUDENTS' USE OF VARIABLES AS A MEANS TO REPRESENT THEIR FUNCTIONAL THINKING IN EARLY GRADES

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 11 – Teaching and learning of algebra

Ayça **Akın***, Tangül **Kabael**
 Anadolu University
 THE LINK BETWEEN PRE-SERVICE MATHEMATICS TEACHERS' QUANTITATIVE REASONING AND THEIR SUPPORT FOR QUANTITATIVE REASONING





Marlene **Dias*** (1), Valdir **dos Santos Junior** (2), Miriam **Guadagnini** (1)

1: Universidade Anhanguera de São Paulo; 2: Universidade Federal de Pernambuco

THE TRANSITION FROM SECONDARY TO HIGHER EDUCATION: THE CASE OF AFFINE FUNCTION IN BRAZIL

Christian **Düsi*** (1), Guido **Pinkernell** (2)

1: Cooperative State University Mosbach; 2: University of Education Heidelberg

ASPECTS OF PROFICIENCY IN SCHOOL ALGEBRA

Satoshi **Enomoto***

University of Tsukuba

AN COMPARISON OF LEARNING TRAJECTORY IN TEXTBOOKS: FOCUSED ON A JAPANESE JUNIOR HIGH SCHOOL TEXTBOOK AND CIA

Viana **Garcia***, Angel **Jimenez**, Flor Monserrat **Rodriguez**

Universidad Autonoma de Guerrero

SYNTHETIC DIVISION LINKING TO THE DIVISION ALGORITHM OF POLYNOMIALS

Rita **Hofmann***, Jürgen **Roth**

Universität Landau

DIAGNOSING STUDENTS' MISTAKES WHILE WORKING WITH GRAPHS OF FUNCTIONS

Kazuhiro **Kurihara***

University of Tsukuba

AN ANALYSIS OF TEACHING MATERIALS OF THE ALGEBRAIC STRUCTURE IN THE MODERNIZATION OF MATHEMATICS EDUCATION

José Hugo Lara **Solís*** (1), María Araceli Juárez **Ramírez** (2), Lidia Aurora Hernández **Rebollar** (3)

1: International School; 2: Benemérita Universidad Autónoma de Puebla; 3: Benemérita Universidad Autónoma de Puebla

METACOGNITIVE STRATEGIES AND PERFORMANCE IN ALGEBRA WORD PROBLEMS.

Aoife **O'Brien***, Máire **Ní Ríordáin**

National University of Ireland

EXAMINING DIFFICULTIES IN INITIAL ALGEBRA IN THE IRISH CONTEXT

Maria Lucia **Panossian*** (1), Manoel Oriosvaldo **de Moura** (2)

1: Universidade Tecnológica Federal do Paraná; 2: Universidade de São Paulo

THE HISTORICAL AND LOGICAL MOVEMENT OF ALGEBRAIC CONCEPTS AS A PRINCIPLE FOR THE CONSTITUTION OF ALGEBRA'S TEACHING OBJE

Preechakorn **Phachana***

Phukhiew School

DIAGRAMS: A TOOL FOR CONNECT ABOUT ALGEBRAIC AND GEOMETRIC REPRESENTATIONS OF ARITHMETIC SERIES

Michaela **Scheuring***, Jürgen **Roth**

University of Koblenz-Landau

REAL EXPERIMENTS OR COMPUTER-BASED SIMULATIONS – HOW TO FOSTER FUNCTIONAL THINKING?

Irma E. **Stevens***, Kevin C. **Moore**

University of Georgia

UNDERGRADUATE STUDENTS' GRAPHING HABITS



Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 12 – Teaching and learning of geometry (primary level)

Benedetto **Di Paola***
 Università degli Studi di Palermo
 ENHANCING GEOMETRICAL KNOWLEDGE, METACOGNITIVE REASONING AND VISUAL
 SPATIAL SKILLS THROUGH A PLAYING CHESS LABORATORY

Asuman **Duatepe-Paksu*** (1), Marc **Husband** (2), Walter **Whiteley** (2)
 1: Pamukkale University; 2: York University
 PRESERVICE TEACHERS' DRAWINGS OF SYMMETRY LINES OF SQUARE

Daniela **Götz***, Hedwig **Gasteiger**
 Universität Osnabrück
 GEOKIG – GEOMETRICAL COMPETENCIES AT PRIMARY SCHOOL AGE

Masanori **Obayashi***
 Joint Graduate School in Science of School Education
 A CONSIDERATION ABOUT THE LEVEL OF LOGICAL THINKING IN FIGURAL DOMAIN

Kerstin **Sitter***
 University of Koblenz-Landau
 THE INFLUENCE OF OUT-OF-SCHOOL LEARNING LOCATIONS ON LASTING KNOWLEDGE AND
 SKILLS RELATED TO GEOMETRIC SOLIDS

Yuko **Sugino***
 Kogakkan Univesity
 CONCEPT FORMATION OF FIGURE BY LOGO PROGRAMMING – PSEUDO PRIMITIVES
 MAKING TURTLE TURN AT INTERIOR ANGLE

João Carlos **Terroso***
 Instituto de Educação
 USING PENROSE TESSELLATIONS TO IDENTIFY ISOMETRIES

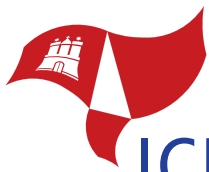
Consuela Luiza **Voica*** (1), Sorin **Alexe** (2), Cristian **Voica** (3)
 1: Herastrau Middle School; 2: XColony Project; 3: Dept. of Mathematics
 USING MANIPULATIVES IN LEARNING GEOMETRY

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 13 – Teaching and learning of geometry – secondary level

Wen-Haw **Chen***
 Tunghai University
 COOPERATIVE LEARNING AS A TOOL TO TEACH A PROFESSIONAL GENERAL COURSE
 IN UNIVERSITY GEOMETRY

Manassés **da Silva Batista*** (1), Raimundo **Nonato Ferreira Tito Filho** (2), Antonio Kennedy **Lopes Dantas**
 (1), Francismar **Holanda** (1)
 1: Federal Institute of Piauí; 2: State University Piauí
 POTENTIALLY SIGNIFICANT TEACHING UNITS INVOLVING 3D GEOMETRY AND
 THALES' THEOREM





João Alves **da Silva***, Manassés **da Silva Batista**, Antonio Kennedy **Lopes Dantas**, Francismar **Holanda**
Federal Institute of Piauí
BLACK AND LIGHT TANGRAM: LEARNING FROM FUN AND INTERACTIVE WAY

Ivko **Dimitric***
Penn State University Fayette
THE CONCEPT OF CENTER OF MASS IN TEACHING OF GEOMETRY

Samvel **Haroutunian***
Armenian State Pedagogical University
SCHOOL COURSE OF GEOMETRY: CONTENT SELECTION AND TEACHING MATERIAL DISTRIBUTION

Marj **Horne*** (1,2), Rebecca **Seah** (2)
1: ACU; 2: RMIT University
DEVELOPING A LEARNING AND ASSESSMENT FRAMEWORK FOR GEOMETRIC REASONING TO SUPPORT TEACHING AND LEARNING IN YEARS 5–9

Soocheol **Kim***
Catholic University of Daegu
AN ANALYSIS OF ACTUAL CODITIONS OF JUSTIFICATION TO KOREAN NEW MATHEMATICS TEXTBOOKS: FOCUS ON MIDDLE SCHOOL GEOMETRY

Sunghee **Kim***
Korea National University of Education
TEACHING ANALYTIC GOEMETRY EMPHASIZING REPRESENTATIONS AND TRANSLATIONS

Chris **Kooloos*** (1), Rainer **Kaenders** (2), Gert **Heckman** (3), Helma **Oolbekkink** (1)
1: Radboud Docentenacademie; 2: HCM; 3: IMAPP
VARIATIO DELECTAT: VARIATION IN MATHEMATICS

Tomohiro **Ogihara***, Tatsuya **Mizogushi**
Tottori University
EDUCATIONAL VALUE OF THE CENTROID OF TRIANGLE

Shinya **Ohta***, Toshiji **Matsubara**
Japan
“VIEWPOINTS AND OBJECTS OF THE OBSERVATION” IN LEARNING SPACE FIGURES

Yuki **Osawa***
Kaichi Mirai Junior and Senior High School
HEURISTIC AND INQUIRY BASED LEARNING USING THE SEIFERT GRAPH

Balvir **Singh***, Arthur **Powell**
Rutgers University
DOING GEOMETRY WITH 21ST CENTURY TOOLS AND NEEDS

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 14 – Teaching and learning of probability

Roos **Blankespoor*** (1,2), Marja **van den Heuvel-Panhuizen** (1), Michiel **Veldhuis** (1),
 Jan **Boom** (3), Anika **Dreher** (2)

1: Freudenthal FSW; 2: IPN Kiel; 3: Dept. of Developmental Psychology
A PILOT STUDY ON TEACHING PROBABILITY IN PRIMARY SCHOOL

Melissa Denisse **Castillo Medrano***

Ministry of Education
ACHIEVEMENTS AND DIFFICULTIES IN LEARNING PROBABILITY

Eva **Morais*** (1), Maria **Nascimento** (1), J. Alexandre **Martins** (2)

1: Universidade de Trás-os-Montes e Alto Douro; 2: Instituto Politécnico da Guarda
REPRESENTATIONS IN PROBABILITY PROBLEMS: SOME EXAMPLES

Barbara **Drollinger-Vetter**, Alex **Buff**, Kathleen **Philipp***

Zurich University of Teacher Education
**PEDAGOGICAL CONTENT KNOWLEDGE AND MOTIVATION – PROBABILITY AS A TOPIC
 IN PRIMARY TEACHER EDUCATION**

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 15 – Teaching and learning of statistics

Rukiye **Aslan***, Sibel **Kazak**

Pamukkale University
**INVESTIGATING MIDDLE SCHOOL MATHEMATICS TEACHERS' PEDAGOGICAL CONTENT
 KNOWLEDGE IN RELATION TO STATISTICAL REASONING**

Ayse Aysin **Bilgin***

Macquarie University
ASSESSMENT IN AN UNDERGRADUATE STATISTICS CAPSTONE UNIT

Karin **Binder***, Stefan **Krauss**, Georg **Bruckmaier**, Jörg **Marienhagen**

University of Regensburg
VISUALIZATION OF COMPLEX BAYESIAN TASKS

Lonneke **Boels*** (1, 2), Arthur **Bakker** (1), Paul **Drijvers** (1), Wim **van Dooren** (3)

1: Utrecht University; 2: Christelijk Lyceum Delft; 3: KU Leuven
STUDENTS' INTERPRETATIONS OF HISTOGRAMS: A REVIEW

Marsha **Davis***, Hari **Koirala**, Sita **Koirala**

Eastern Connecticut State University
TEACHING STATISTICS THROUGH APPLETS

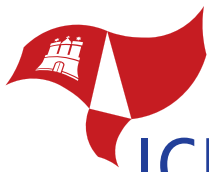
George **Ekol***

Kyambogo University
TEACHER EDUCATION IN UGANDA: IMPLICATIONS FOR STATISTICS EDUCATION

Ida **Kukliansky***

Ruppin Academic Center
**INTERPRETATION OF CUMULATIVE FREQUENCY DISTRIBUTION GRAPHS:
 THREE LEVELS OF SENSE**





Catherine Lynn **Lane***

University of Cincinnati Clermont College

LESSONS LEARNED FROM USING 'MESSY DATA' FOR A LEARNING PROJECT IN AN APPLIED STATISTICS COURSE

Hana Manor **Braham***, Dani **Ben-Zvi**

Haifa University

DESIGNING FOR REASONING WITH UNCERTAINTY USING THE INTEGRATED MODELLING APPROACH

Achim **Schiller***, Joachim **Engel**

PH Ludwigsburg University of Education

CIVIC STATISTICS AND THE PREPARATION OF FUTURE SECONDARY SCHOOL MATHEMATICS TEACHERS

Mathieu **Séguin***, Sylvain **Vermette**

UQTR

SECONDARY SCHOOL MATHEMATICS TEACHERS PROFESSIONAL UNDERSTANDING OF THE ARITHMETIC AVERAGE CONCEPT.

Sietske **Tacoma***, Paul **Drijvers**, Johan **Jeuring**

Utrecht University

ONLINE FEEDBACK IN HIGHER STATISTICS EDUCATION

Candy **Walter***

Universität Hildesheim

AN EMPIRICAL STUDY ON PLANNING AND IMPLEMENTATION OF STATISTICAL DATA COLLECTIONS OF PUPILS OF THE 9TH AND 10TH GRADE

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 16 – Teaching and learning of calculus

Matias **Arce***, Laura **Conejo**, Tomás **Ortega**

University of Valladolid

INDETERMINATE FORMS: TRACES OF A PROCEDURAL POINT OF VIEW IN STUDENTS

Qun **Lin** (1), Rongrong **Cao*** (2)

1: Academy of Mathematics and Systems Science; 2: School of Mathematics and Statistics

CALCULUS BASED ON ARITHMETIC

Jun **Chai** (1), Louis **Friedler*** (2), Edward **Wolff** (2), Jun **Li** (3), Karen **Rhea** (4)

1: East China Normal University; 2: Arcadia University; 3: Deakin University; 4: University of Michigan

A CHINA / US CALCULUS STUDY

Xuefen **Gao***, Lina **Zhang**

ZSTU

A COMPARISON OF CALCULUS IN HIGH SCHOOL MATHEMATICS TEXTBOOKS BETWEEN CHINA AND UNITED STATES

Ma. de Lourdes **Quezada-Batalla***, Rubén-Darío **Santiago-Acosta**, Ernesto **Hernández-Cooper**

ITESM-CEM

CALCULUS LABORATORY WITH FREE DESMOS SOFTWARE

Marit Hvalsøe **Schou***

University of Southern Denmark

USING TANGIBLE MATERIALS AND TECHNOLOGY AS VISUALISATION IN UPPER SECONDARY CALCULUS TEACHING

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 18 – Reasoning and proof in mathematics education

Cydara Cavedon **Ripoll***

Universidade Federal do Rio Grande do Sul

MATHEMATICAL REASONING AND PROOF IN SCHOOL

Kimberly **Conner*** (1), Michelle **Cirillo** (2), Samuel **Otten** (1)

1: University of Missouri; 2: University of Delaware

LAUNCHING PROOF: A MULTI-LEVEL ANALYSIS OF SEVEN TEXTBOOKS

Emine Gaye **Çontay*** (1), Asuman Duatepe **Paksu** (2), Sibel **Kazak** (3)

1: Pamukkale University; 2: Pamukkale University; 3: Pamukkale University

THE PROOF SCHEMES OF PROSPECTIVE ELEMENTARY MATHEMATICS TEACHERS

Beata Lididimikeni **Dongwi***, Marc **Schafer**

Rhodes University

EXAMINING MATHEMATICAL REASONING THROUGH ENACTED VISUALIZATION WHEN SOLVING WORD PROBLEMS

Aurora **Fernández-León***, Rocío **Toscano**, José María **Gavilán-Izquierdo**

University of Seville

A MODEL TO CHARACTERIZE THE ACTIVITIES OF PROVING AND CONJECTURING OF PROFESIONAL MATHEMATICIANS

Soheila **Gholamzad***

Research Institute for Education

PROOF AS A LITERATE MATHEMATICAL DISCOURSE

Abigail L. **Higgins***, Shiv Smith **Karunakaran**

Washington State University

AN INQUIRY-BASED APPROACH TO TEACHING AN INTRODUCTION TO PROOF COURSE

Andrea **Hofmann***, Sikunder **Ali**, Trond Stølen **Gustavsen**

University College of Southeast Norway

UNDERSTANDING AND DEVELOPING PRACTICES OF REASONING IN MATHEMATICS AMONG PRE-SERVICE AND IN-SERVICE MATHEMATICS TEACHERS

Julian **Krumsdorf***

University of Cologne

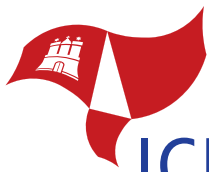
VISUAL REASONING

Zekiye **Ozgur***

University of Wisconsin-Madison

AN INVESTIGATION OF PROOF CONCEPTIONS IN A HIGH SCHOOL MATHEMATICS CLASSROOM





Miriam **Krieger** (1), Walther **Paravicini*** (1), Anja **Panse** (2)

1: Münster University; 2: Paderborn University

SELF-EXPLANATION TRAINING FOR ENHANCING PROOF COMPREHENSION
AT UNIVERSITY – AN EMPIRICAL ANALYSIS

Petra Carina **Tebaartz***

Justus-Liebig-University of Gießen

PROVING IN MATHEMATICAL OLYMPIADS – A TASK ANALYSIS

**Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 19 – Problem solving in mathematics education**

P

Yerkara Zholdibayuly **Aidos***

Kazakh National Technical University after K.I.Satpayev

ADDRESSING ISSUES RELATED TO SOME CONCEPTS OF MATHEMATICS

Michèle **Couderette*** (1), Chantal **Amade-Escot** (1), Francia **Leutenegger** (2)

1: University Jean Jaurès Toulouse 2; 2: Université de Genève

WHAT PROBLEM-SOLVING PRINCIPLES ARE EXPLICITLY ADDRESSED FOR THE TEACHING
OF SUBTRACTION IN SWISS AND FRENCH CURRICULA?

Pedro **da Cruz Almeida*** (1), António **Domingos** (2), Cecília **Monteiro** (1)

1: Escola Superior de Educação do Instituto Politécnico de Lisboa; 2: Faculdade de Ciências e Tecnologia –
Universidade Nova de Lisboa

THE FORMULATION OF MULTIPLICATIVE CONTEXTS BY 3RD YEAR STUDENTS

Maria Madalena **Dullius***, Geovana Luiza Kliemann

Univates

TEXTBOOKS AND MATHEMATICAL PROBLEM SOLVING

Cristina **Esteley***, Mónica **Villarreal**

Facultad de Matemática Astronomía y Física-Universidad Nacional de Córdoba

PROBLEM POSING AND MATHEMATICAL MODELING SCENARIOS:
GAINING DISTINCTIVENESS AND SOUNDNESS

Maria Elisa **Galvão***, Rosana **Lima**

Universidade Anhanguera de São Paulo

A METHODOLOGY FOR ORGANIZING PROBLEM SOLVING PROCESSES – AN ENTRY ATTACK

Hayato **Hanazono***

University of Tsukuba

AESTHETIC JUDGMENTS IN HIGH SCHOOL STUDENTS' MATHEMATICAL PROBLEM SOLVING

Magali **Hersant*** (1), Christine **Choquet** (1), Laetitia **Bueno-Ravel** (2)

1: Université Nantes; 2: ESPE de Bretagne

INQUIRY: RELATIONS BETWEEN RESEARCH QUESTIONS AND CURRICULUM REFORMS
IN FRANCE

Pimpaka **Intaros*** (1), Maitree **Inprasitha** (2), Sampan **Thinwiangthong** (3)

1: Ph.D. student in Mathematics Education Program; 2: Assistant Professor; 3: Lecturer

STUDENTS' NATURAL WAYS OF THINKING IN MATHEMATICS CLASSROOM TAUGHT
BY OPEN APPROACH

Tsutomu **Ishii***
Bunkyo University
RESEARCH ON THE TEACHING DEEPEN THE ARGUMENTATION IN PROBLEM SOLVING

Takashi **Kato*** (1), Seiji **Moriya** (2), Toshihiko **Shindo** (3)
1: Tokyo University and Graduate School of Social Welfare; 2: Tamagawa University;
3: Yamanashi University
EFFECTS OF STUDENTS REVIEWED "RELATIVE VALUES" USING DIAGRAMS

Chaeyeon **Kim***, Jaehong **Shin**
Korea National University of Education
HOW DOES THE WAY OF ORGANIZING CONTINUOUS COVARIATIONAL SITUATIONS
AFFECT PROBLEM SOLVING?

Qimeng **Liu***, Xiaofeng **Du**, Jian **Liu**
Beijing Normal University
THE RELATIONSHIP BETWEEN SELF-EFFICACY AND MATHMETICS PROBLEM SOLVING
WITHIN CHINESE GRADE 4 STUDENTS

Amal **Mattoo***
Sidwell Friends School
INTRODUCING PROBLEM SOLVING STRATEGIES IN A RURAL MIDDLE SCHOOL IN KASHMIR

Anne **Möller***
University of Duisburg-Essen
TEACHING VIA PROBLEM SOLVING VS. TEACHER-CENTERED ACCESS – A COMPARISON

Erica Marlúcia Leite **Pagani*** (1), Norma Suely **Gomes Allevato** (2)
1: Centro Federal de Educação Tecnológica de Minas Gerais-CEFETMG; 2: Universidade Cruzeiro do Sul
CONTRIBUTIONS OF METHODOLOGY OF TEACHING-LEARNING-ASSESSMENT THROUGH
PROBLEM SOLVING WHEN WORKING WITH DERIVATIVES

Ruud **Stolwijk*** (1,2), Dédé **de Haan** (2), Michiel **Doorman** (2), Monica **Wijers** (2)
1: Cito Arnhem; 2: Freudenthal Institute
THE ALYMPIAD – A PRACTICAL PROBLEM SOLVING CHALLENGE

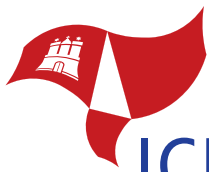
Kwame **Yankson***, Jillian **Mortimer**, Edward **Silver**
University of Michigan
PISA PROBLEMS AS RESOURCES FOR MATHEMATICS PROBLEM-SOLVING INSTRUCTION

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 20 – Visualisation in the teaching and learning of mathematics

Leonardo **Barichello***
University of Nottingham
MATHEMATICAL REASONING WITH VISUAL REPRESENTATIONS IN SECONDARY SCHOOL

Rafael Ernesto **Bourguet-Diaz***, Ruth **Rodriguez**
Tecnologico de Monterrey
FOCUSING ON CONCEPTS RATHER THAN IN TECHNIQUES INTO DIFFERENTIAL EQUATIONS





Ching Han **Cheung***, Kai Yee **Chiu**
HKCCCU Logos Academy

DEVELOPING VISUAL PERCEPTION AND VISUAL IMAGERY FOR ELEMENTARY STUDENTS

Carolien **Duijzer*** (1), Marja **van den Heuvel-Panhuizen** (1,2), Michiel **Veldhuis** (1), Michiel **Doorman** (2)
1: Freudenthal FSW; 2: Freudenthal Institute FBW

A PILOT STUDY ON TEACHING GRAPHING OF CHANGE

Christine **Gärtner***, Kathrin **Cornetz**, Esther **Doumbouya-Hoffmann**, Mareile **Shaw**, Jochen **Laubrock**
University of Potsdam

MATHEMATICAL STORY PROBLEMS IN TEXT FORM VERSUS IN COMIC FORM

Maria Teresa **Escriva**, Maria Jose **Beltran-Meneu**, Adela **Jaime**, Angel **Gutierrez**, Bernardo **Gomez***
Universidad de Valencia

ABILITIES OF VISUALIZATION IN PRIMARY SCHOOL STUDENTS WITH DIFFERENT
MATHEMATICAL TALENT

Josef **Molnár***, Ludmila **Kroulíková**, Jana **Slezáková**
Palacký University Olomouc

TESTING OF GEOMETRICAL IMAGINATION NUMBER 2

Barbara **Ott***
PH St. Gallen

ANALYSIS OF CHILDREN'S DRAWINGS TO WORD PROBLEMS

Angela **Schmitz***
University of Education

COMPLEX ATTITUDES TOWARDS MATH VISUALIZATION IN THE CLASSROOM

Alla **Stolyarevska*** (1), Yuriy **Kuznyetsov** (2)

1: International Solomon University; 2: Research Production Enterprise Hartron-Arkos

THE VISUALIZATION OF SPACECRAFT ORBITAL MANEUVERS WITH USING GEOGEBRA
PACKAGE

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer

TSG 21 – Mathematical applications and modelling in the teaching and learning of mathematics

Marianela Cristina **Asinari***, Shirley Luz **Frassa**
Universidad Nacional de Córdoba

MATHEMATICAL MODELING EXPERIENCE IN A RURAL SECONDARY SCHOOL WITH
MULTIGRADE MODE

Roque **Batulan***
Abu Dhabi Men's College

MODELING, COMPUTING AND TECHNOLOGY SIMULATION: AN APPROACH TO LEARNING
APPLICATIONS OF NUMERICAL APPROXIMATIONS

Patrick **Capraro***
University of Kaiserslautern

A MODELING PROJECT FOR THE ENTIRE SECONDARY SCHOOL CURRICULUM

Mary C. **Enderson***, Ginger S. **Watson**

Old Dominion University

PRE-SERVICE MATHEMATICS TEACHERS' EXPERIENCES IN USING MODELING TASKS TO DEVELOP MATHEMATICAL QUESTIONING

Régis **Forner***

UNESP Rio Claro

PAULO FREIRE AND MATHEMATICAL MODELING: TRACES OR INTERCONNECTIONS?

Jeannette **Galleguillos***, Marcelo **Borba**

Universidade Estadual Paulista

MATHEMATICAL MODELING IN AN ONLINE EXTENSION COURSE

Antonnette **Gibbs***, Joo Young **Park**

Florida Institute of Technology

MESH (MATHEMATICS EXPRESSING SOCIETY'S HOPES): A TOOL FOR UNCOVERING THE ROLE OF MATHEMATICS IN SOCIETY

Tomoaki **Harada***

Tokyo University of Science

A STUDY OF THE DEVELOPMENT OF TEACHING MATERIALS RELATED TO "RAILWAY" AS A MATHEMATICAL ACTIVITY

Ernesto **Hernández-Cooper***, Rubén-Darío **Santiago-Acosta**, Lourdes **Quezada-Batalla**

ITESM-CEM

NUMERICAL STRATEGIES ON A CALCULUS COURSE

Ortega **Miriam**, Diago **Pascual**, Ferrando **Irene***, Puig **Luis**

Universita de València

DUALITY IN MODELLING TASKS: STUDENTS' PERFORMANCES IN TWO TASKS OF DIFFERENT KIND

Shigekazu **Komeda*** (1), Takashi **Kawakami** (2), Koichi **Tateishi** (3), Atushi **Urago** (3), Go **Ishii** (3), Akihiko **Saeki** (4)

1: Saga University; 2: Nishikyushu University; 3: Elementary School Attached to Saga University;

4: Naruto University of Education

DEVELOPING YEAR 6 STUDENTS' CONCEPTS OF SPEED IN RELATION TO "WALKING"

Alexandra **Krüger***

University of Hamburg

STUDENT S PERSPECTIVE ON METACOGNITIVE STRATEGIES IN GROUP WORK IN MATHEMATICAL MODELLING

Stephen T. **Lewis***, Sarah **Gilchrist**, Azita **Manouchehri**

The Ohio State University

PROVOKING VALIDATION AND REFLECTION IN OPEN MATHEMATICAL MODELLING TASKS

Margaret **Mohr-Schroeder***, Jennifer **Wilhelm**

University of Kentucky

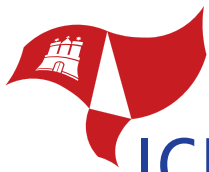
MODELING FOR UNDERSTANDING WITH NOYCE FELLOWS

Yoshiki **Nisawa***

Bukkyo university

BASIC RESEARCH TO PROMOTE THE USE OF MATHEMATICAL MODELLING: REGARDING THE IDENTIFICATION OF VARIABLES





Carola **Pickhardt***, Sabrina **Brix**, Henning **Jolmes**, Lea **Nörenberg**, Stefanie **Schlegel**, Isabell **Schreiber**,
Karla **Weber**, Jan **Ziegenhirt**, Marleen **Zwintschert**, Clemens **Möller**
University of applied sciences Albstadt-Sigmaringen
DEVELOPMENT OF MODELLING TASKS BY STUDENTS

Julia **Rausenberger***
Fachhochschule Nordwestschweiz
MODEL-BASED INSTRUCTION IN THE CONTEXT OF MATHEMATICAL MODELING
SUPPORTS LEARNING

Márcia Jussara Hepp **Rehfeldt***, Elise Cândida **Dente**, Marli Teresinha **Quartieri**
Centro Universitário Univates
EXPLORING THE HUMAN BODY AND THE PLAYING BY MEANS OF THE MATHEMATICAL
MODELING IN THE FIRST YEARS OF THE ELEMENTARY SCHOOL

Mohammadreza **Salajegheh***
Ministry of Education
STUDENTS' UNDERSTANDING AND THEIR PERFORMANCE DURING THE MODELLING CYCLE

Micah **Stohlmann***
University of Nevada
MATHEMATICAL MODELLING PROFESSIONAL DEVELOPMENT: WHY MORE IS NEEDED

Rintaro **Ueda***
Tokyo Metropolitan Nerima Technical High School
A STUDY ON POSING MODELLING TASK AS A STAFF OF A COFFEE SHOP:
FOCUS ON TASK COMPLEXITY IN A MATHEMATICAL LESSON

Lisa **Wendt***
University of Hamburg
TEACHER INTERVENTIONS DURING INDEPENDENT WORKING PHASES OF
MATHEMATICAL MODELLING ACTIVITIES

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 22 – Interdisciplinary mathematics education

Ivana **Boboňová***, Sona **Eretková**
Constantine the Philosopher University in Nitra
ASSESSMENT OF MATHEMATICAL COMPETENCIES OF BIOLOGY TEACHER TRAINEES

Carrie Diaz **Eaton*** (1), Sam **Donovan** (2), Stith T. **Gower** (3), Kristin **Jenkins** (4), M. Drew **LaMar** (5),
Jennfer **Cartier** (1), Dorothy Belle **Poli** (6), Jeremy **Wodjak** (7), Arietta **Fleming-Davies** (7), Alison **Hale** (2),
Gaby **Hamerlinck** (4)
1: Unity College; 2: University of Pittsburgh; 3: North Carolina State University; 4: BioQUEST;
5: The College of William and Mary; 6: Roanoke College; 7: Radford University
QUBES; QUANTITATIVE UNDERGRADUATE MATHEMATICAL BIOLOGY

Ilze **France***, Liga **Cakane**, Uldis **Dzerve**, Dace **Namsone**, Janis **Vilcins**
University of Latvia
USAGE OF MATHEMATICS COMPETENCY IN A NEW CONTEXT IN SCIENCE EXPERIENCE
OF LATVIA

Kathryn Anne **Holmes*** (1), Adam **Lloyd** (2), Jennifer **Gore** (2), Max **Smith** (2), Leanne **Fray** (2),
Claire **Wallington** (2)

1: Western Sydney University; 2: University of Newcastle

STUDENTS' ASPIRATIONS FOR STEM CAREERS

Peter **Ludes***

TU Dresden

**FOSTERING OF INTERDISCIPLINARY COMPETENCES THROUGH BASIC EDUCATION
IN COMPUTER SCIENCE IN MATHEMATICS IN PRIMARY SCHOOL**

Patricia **McNicholas***

Robert Morris University Illinois

AN INTERDISCIPLINARY ACTIVITY ON ANGIOGENESIS

Amanda Jo **Meiners***, Jihyun **Hwang**, Kyong Mi **Choi**

University of Iowa

**RELATIONSHIPS OF COGNITIVE DOMAINS: FOCUS ON REASONING AND APPLYING
IN MATHEMATICS AND SCIENCE**

Emmanuel **Rollinde***

Sorbonne Universités

ENACTING PLANETS

Craig **Russell***

University of Illinois Laboratory High School

GEOMETRY FROM A GLOBAL PERSPECTIVE

Edita **Smieskova***, Sona **Ceretkova**

Constantine the Philosopher University in Nitra

GEOMETRY IN SLOVAK BLUEPRINT

Jennifer **Wilhelm*** (1), Molly **Fisher** (2)

1: University of Kentucky; 2: University of Kentucky

**PREPARING STEM TEACHERS AS RESEARCHERS: A RESEARCH EXPERIENCES FOR
UNDERGRADUATES PROJECT**

Time: Tuesday, 26 July 2016, 18.00–19.00 / Location: I: blue, Philosophical Tower, foyer

TSG 23 – Mathematical literacy

Yi-Chao **Chang*** (1), Yun-Zu **Chen** (2)

1: Taipei Municipal Nanhu Senior School; 2: National Taiwan Normal University

ADOLESCENTS' DECODING STRATEGIES FOR ORTHOGONAL VIEWS OF SMALL CUBES

Christian **Dorner***

University of Vienna

WHAT FINANCIAL MATHEMATICS SHOULD BE TAUGHT IN MATH CLASSES?

Xiaofeng **Du***, Da **Zhou**, Jian **Liu**

Beijing Normal University

**THE STUDY OF STUDENTS' PERFORMANCES IN MATHEMATICS VISUALIZATION
ON GRADE EIGHT**





Takayuki **Kodera***

Kyoto Tachibana University

MATHEMATICAL LITERACY IN DEALING WITH NUCLEAR ACCIDENT

Vuyani Hodecius **Matsha***

Nelson Mandela Metropolitan University

THE EFFECT OF THE DYNAMIC MATHEMATICS SOFTWARE GEOGEBRA
ON MATHEMATICAL LITERACY PRESERVICE STUDENTS' PERCEPTIONS OF ICT

Kathy **O'Sullivan***, Paul F. **Conway**

University of Limerick

MAPPING FRAMINGS OF NUMERACY TEACHING AND LEARNING IN DIFFERENT
SUBJECTS AT POST PRIMARY LEVEL

José Manuel **Diego-Mantecón** (1), Maitane P. **Istúriz*** (1), Teresa Fernandez **Blanco** (2),
Elena Haro **Maestro** (1)

1: University of Cantabria; 2: University of Santiago de Compostela

MATHEMATICAL LITERACY; OBSERVING CUSTOMERS OF HOME PRODUCTS IN REAL
LIFE SITUATIONS THAT IMPLY MATHEMATICS

Cornelia **Plunger***

Alpen-Adria-Universität Klagenfurt

MODEL- AND CONTEXT-ORIENTED REFLECTION IN MATHEMATICS CLASSROOMS

Zulkardi **Zulkardi*** (1), Ilma **Ratu** (2)

1: Sriwijaya University; 2: Sriwijaya University

SUPPORTING STUDENTS LEARNING MATHEMATICS LITERACY IN INDONESIA

**Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 24 – History of the teaching and learning of mathematics**

Nataliia **Chuikova*** (1), Sergey **Atanasyan** (1), Sergey **Polikarpov** (1), Ildar **Safuanov** (2)

1: Moscow Pedagogical State University; 2: Moscow City Pedagogical University

HISTORY OF SCHOOL MATHEMATICAL EDUCATION AND PREPARING MATHEMATICS
TEACHERS IN MOSCOW DURING SOCIAL AND ECONOMIC CHANGES

Tanja **Hamann***

Universität Hildesheim

“SICKENED BY SET THEORY?” – ABOUT NEW MATH IN GERMAN PRIMARY SCHOOLS

Kei **Kataoka***

Wakayama University

REFORM IN SECONDARY SCHOOL SOLID GEOMETRY DURING WORLD WAR II, IN JAPAN

Bairon Saul **Ordonez** (1), Marvin Roberto **Mendoza** (2), Luis **Ramos*** (3)

1: Catholic University of Honduras; 2: National Autonomous University of Honduras;

3: Francisco Morazán National Pedagogical University

TEACHING MATHEMATICS IN HONDURAS: ORIGINS, DEVELOPMENT, AND CHALLENGES

Boubaker-Khaled **Sadallah***

Ecole Normale Supérieure

THE TRANSLATION OF MATH BOOKS INTO ARABIC THROUGHOUT THE AGES,
AND ITS RELATIONSHIP WITH THE TEACHING

Shafie **Shokrani***
 University of Siegen
 MATHEMATICS AND LEONARD NELSON'S SOCRATIC METHOD

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 25 – The Role of History of Mathematics in Mathematics Education

Ashish **Arora***
 IKG Punjab Technical University
 ACTIVITIES FOR THE CONSTRUCTION OF GEOMETRICAL FIGURES BASED UPON
 SULBA SUTRA

Hari **Koirala***, Marsha **Davis**, Sita **Koirala**
 Eastern Connecticut State University
 USING HISTORY OF MATHEMATICS TO ADDRESS THE COMMON CORE STANDARDS

Kurniati **Aisah**, Tita Khalis **Maryati***, Ramdani **Miftah**
 Syarif Hidayatullah State Islamic University of Jakarta
 HOW NEGATIVE NUMBERS CAN BE ACCEPTED IN THE COMMUNITY OF ASIA AND EUROPE?

Jiawei **Yu***
 Section Chinoise
 TEACHING MATHÉMATIQUES EN CHINOIS BY USING CHINESE MATHEMATICAL HISTORY

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 26 – Research on teaching and classroom practice

Jenny Patricia Acevedo **Rincón***, Dario **Fiorentini**
 Unicamp
 LEARNING OF THE MATH TEACHERS IN A TRANSDISCIPLINARY PRACTICE
 IN PRESERVICE EDUCATION

Tugba **Aysel***
 Dublin City University
 USING LESSON STUDY TO EXPLORE PRIMARY/POST-PRIMARY TRANSITIONS
 IN MATHEMATICS

Okil **Bensaci***
 University of Kasdi Merbeh Ouargla Algeria
 THE EFFECTIVENESS OF SOME INSTRUCTIONAL SKILLS FOR IMPROVING THE LEVEL OF
 METACOGNITION IN MATHEMATICS AMONGST FOURTH G

Aytu Özaltun **Çelik** (1), Esra Bukova **Güzel*** (2)
 1: Pamukkale University; 2: Dokuz Eylül University
 HYPOTHETICAL LEARNING TRAJECTORY RELATED TO QUADRATIC FUNCTIONS

Amber **Candela***
 University of Missouri – St. Louis
 MATHEMATICS TEACHERS' PERSPECTIVES OF FACTORS AFFECTING IMPLEMENTATION
 OF HIGH COGNITIVE DEMAND TASKS





Analise **Castro***, Christy **Horning**

California State University

ANALYSIS ON ASSESSMENT AND ATTITUDE IN AN ALGEBRA CLASSROOM IN AN URBAN SETTING

Katawut **Chartsakyut***, Natcha **Kamol**

Chiang Mai University

BUILDING RAPPORT WITH STUDENTS IN MATHEMATICS CLASSROOM: A CASE STUDY

Catarina Raquel **Delgado*** (1), Joana Maria **Brocardo** (1), Hélia Margarida **Oliveira** (2)

1: Escola Superior de Educação do Instituto Politécnico de Setúbal; 2: Instituto de Educação

TEACHERS' PRATICES AND NUMBER SENSE DEVELOPMENT IN ELEMENTARY SCHOOL

Claudia **Flores***, Adriana **Gómez**

Instituto Politécnico Nacional

USAGE OF LEARNING NETWORKS FOR MATHEMATICS' STUDY:

CALCULUS, PROBABILITY AND STATISTICS

Vivilí Maria Silva **Gomes***

Universidade Federal do ABC-UFABC

MATHEMATICS TEACHING PRACTICES AS CURRICULAR COMPONENT:

WORKING TOGETHER FOR HIGH SCHOOL

Lisa Lunney **Borden*** (1), David **Reid** (2), Ellen **Carter** (1)

1: St. Francis Xavier University; 2: University of Bremen

SEEKING SIMILARITIES IN PEDAGOGY: A CANADIAN PERSPECTIVE

Kátia Maria **de Medeiros*** (1), Mirian Raquel Alves **da Silva** (2)

1: Universidade Estadual da Paraíba; 2: Universidade Estadual da Paraíba

REFLECTING FROM PRACTICE: CONTRIBUTIONS OF MATHEMATICAL FORMULATION

AND PROBLEM SOLVING IN THE SUPERVISED PRACTICE

Patricia Sandalo **Pereira*** (1), Edinalva da Cruz Teixeira **Sakai** (2)

1: Federal University of Mato Grosso do Sul UFMS; 2: Federal University of Mato Grosso do Sul UFMS

A BRAZILIAN RESEARCH OVERVIEW OF SUPERVISED TRAINING PRACTICAL COURSE

Dilma **Fregona** (1), Pilar **Orús** (2), Laura **Peydró*** (2), Pablo **Gregori** (2)

1: FAMAF-Universidad Nacional de Córdoba; 2: Universitat Jaume I de Castellon

RESOURCES GENERATED IN THE FRAME OF THE THEORY OF DIDACTICAL SITUATIONS

FOR THE TRAINING OF TEACHERS AND RESEARCHERS

Yvonne **Reilly***, Jodie **Parsons**, Thao **Huynh**

Sunshine College

EFFECTS OF RECIPROCAL TEACHING ON STUDENT PERCEPTIONS ABOUT MATHEMATICS.

Alejandro Miguel Rosas **Mendoza*** (1), Jorge Luis Rosas **Mendoza** (1), Leticia **del Rocío Pardo Mota** (2)

1: Instituto Politécnico Nacional; 2: Secretaría de Educación de Veracruz

USING ACTION MOVIES TO MOTIVATE MATHEMATICAL MODELS IN CLASSROOM

Fanglin **Tian**, Jian **Wang***, Sen **Wu**

No.2 High School of East China Normal University

INTEGRATING CLASSROOM TEACHING OF HIGH SCHOOL MATH IN CHINA AND

THE UNITED STATES

Guangming **Wei*** (1), Junliang **Wang** (2)

1: Primary School attached to Zhonghua Secondary School; 2: Experimental Primary School in Jiangdu District

CLASSROOM TEACHING AROUND CORE KNOWLEDGE IN PRIMARY MATHEMATICS EDUCATION IN CHINA

Masaya **Yamawaki*** (1), Yasushi **Yamamoto** (2), Tatsuya **Mizoguchi** (3)

1: Junior High School Attached to Tottori University; 2: Tohaku Junior High School; 3: Tottori University

REPRODUCING LESSONS ABOUT THE UNIT 'FUNCTIONS AND EQUATIONS': EDITING TEACHER'S GUIDEBOOKS THROUGH LESSON STUDIES

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 27 – Learning and cognition in mathematics

Gabriela Georgeta **Dumitrascu***

Eastern Michigan University

UNDERSTANDING THE PROCESS OF GENERALIZATION IN MATHEMATICS THROUGH ACTIVITY THEORY

Diana **Henz***

University of Mainz

BODILY MOVEMENTS ENHANCE VISUO-SPATIAL STRATEGIES IN ALGEBRA AND GEOMETRY: AN EEG STUDY

Virginia **Montoro*** (1), Marcela **Cifuentes** (1), Ma. Jesus **Bianchi** (1), Nora **Scheuer** (1,2)

1: Universidad Nacional del Comahue; 2: Consejo Nacional de Investigaciones Científicas y Técnicas

STUDENTS THINKING ABOUT THE NUMBER LINE

Lianhua **Ning***

Nanjing Normal University

SURVEY ON CURRENT SITUATION OF UNDERGRADUATES' MATHEMATICS LEARNING IN CHINA

David **Nutchey***, Edlyn **Grant**, Tom **Cooper**

Queensland University of Technology

GENETIC DECOMPOSITIONS OF A MATHEMATICS CURRICULUM

Amanjot **Toor***, Joyce **Mgombelo**

Brock University

INTERMEDIATE MATHEMATICS TEACHERS' EXPERIENCES OF TEACHABLE MOMENTS

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 28 – Affect, beliefs and identity in mathematics education

Mary **Coupland***, Anne **Prescott**, Marco **Angelini**

University of Technology Sydney

"MATHS INSIDE" – A PROJECT TO ENHANCE MATHEMATICS IDENTITY





Andreas **Frank***, Stefan **Krauss**
University of Regensburg

THE IMPACT OF PROPAEDEUTIC SCIENCE COURSES ON STUDENT BELIEFS

Florence **Gabriel***, Jason **Signolet**, Martin **Westwell**
Flinders University

A DATA MINING APPROACH TO INVESTIGATING MATHEMATICS DISPOSITIONS

Monica Nymoén **Hansen***

UIT – The Arctic University of Norway

STUDENT PARTICIPATION – A WAY TO MOTIVATION?

Hyunju **Kim***, InAh **Hwang**, Won Kyung **Kim**
Korea National University of Education

A LONGITUDINAL ANALYSIS ON KOREAN STUDENTS' NON-COGNITIVE CHARACTERISTICS IN MATHEMATICS

Hsin-Yi **Kung*** (1), Ching-Yi **Lee** (2)

1: National Changhua University of Education; 2: Feng Chia University

THE CONSTRUCTION AND CONFIRMATION OF HIGHER-ORDER MATHEMATICS AFFECT MODEL FOR JUNIOR HIGH SCHOOL STUDENTS IN TAIWAN

Carmen León **Mantero***, Alexander Maz **Machado**, María José **Madrid**, Noelia Jiménez **Fanjul**
Universidad de Córdoba

ANALYSIS OF THE ATTITUDES TOWARD MATHEMATICS OF FUTURE PRIMARY EDUCATION TEACHERS

Juan Gabriel Molina **Zavaleta*** (1), Mario **Sánchez** (2), Alejandro **Rosas** (3), Avenilde **Romo** (4), Apolo **Castañeda** (5)

1: National Polytechnic Institute; 2: National Polytechnic Institute; 3: National Polytechnic Institute; 4: National Polytechnic Institute; 5: National Polytechnic Institute

MATHEMATICS AS A CAREER AMONG MEXICAN FEMALE STUDENTS

Roxanne **Moore***, Richard **Lamb**, Kira **Carbonneau**
Washington State University

MEASURING STUDENT VALUES: WHAT SECONDARY STUDENTS IN HAWAII VALUE IN MATHEMATICS LEARNING

Priscilla E.L. **Murphy*** (1,2), Leigh N. **Wood** (1)

1: Macquarie University; 2: Manukau Institute of Technology

A MODEL OF STUDENT LEARNING

Kwon Na **Young***, Kim Sang **Hun**
Sejong Science High School

CHANGES OF STUDENTS' ATTITUDES IN MATHEMATICS WITH ASSISTANT TEACHERS

Stine Karen **Nissen***, Pia Beck **Tonnesen**, Maria Christina **Secher Schmidt**
Metropolitan University College

PHOTO ELICITATION INTERVIEWS AS A WAY OF ACCESSING PRIMARY SCHOOL STUDENTS' ATTITUDES

Audrey **Paradis***, Sonja **Lutovac**, Katri **Jokikokko**, Raimo **Kaasila**
University of Oulu

FINNISH AND CANADIAN MATHEMATICS TEACHERS' PERCEPTIONS OF THEIR AUTONOMY

Safrudiannur **Safrudiannur*** (1,2), Benjamin **Rott** (1)
 1: Universität Duisburg-Essen; 2: Mulawarman University
A COMPARATIVE STUDY OF MATHEMATICS CURRICULA OF SECONDARY SCHOOL

Alexandra **Scherrmann***
 Pädagogische Hochschule Ludwigsburg
MEASURED AFFECTS WHILE USING DIFFERENT TYPES OF WORKED EXAMPLES

Dong-Hoon **Shin***, Na Young **Kwon**
 Inha University
CHANGES OF PRESERVICE TEACHERS' MATHEMATICS EPISTEMOLOGICAL BELIEFS

Bok Eun **Son***
 Ajou University in Korea
DEVELOPMENT OF THE DIAGNOSTIC WORKSHEET FOR KOREAN STUDENTS COUNSELING ON LEARNING MATHEMATICS

Neruja **Suriakumaran***, Maike **Vollstedt**, Christoph **Duchhardt**
 Universität Bremen
PERSONAL MEANING AND MOTIVATION WHEN LEARNING MATHEMATICS

Sampan **Thinwiangthong***, Maitree **Inprasitha**, Suladda **Loipha**
 Khon Kaen University
STUDENTS' ATTITUDES TOWARD MATHEMATICS LEARNING IN CLASSROOM FOCUSING ON SMALL-GROUP MATHEMATICAL COMMUNICATION

Jose M. Diego **Mantecon** (1), Carmen **Graña** (1), Teresa Fernandez **Blanco** (2), Raquel Vallines **Mira*** (3)
 1: Universidad de Cantabria; 2: Universidad de Santiago de Compostela;
 3: University of Texas at San Antonio
TEACHER MATHEMATICS-RELATED BELIEFS AND THEIR RELATIONSHIP WITH CLASSROOM PRACTICE: A CASE STUDY

Time: Friday, 29 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 30 – Mathematical competitions

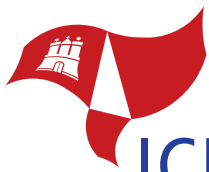
Chih-Ru **Hsiao***
 Department of Mathematics
SOME OBSERVATIONS OF HIGH SCHOOL STUDENT'S MATHEMATICAL CONTEST OF MODELING IN TAIWAN

Stephen **Krevisky***
 Middlesex Community College
ANATOMY OF A MATH COMPETITION: LOOKING AT THE MATH CONTEST IN THE CONNECTICUT COMMUNITY COLLEGE SYSTEM, USA

Meena **More***
 Modern College of Engineering
MATHEMATICS AND ENGINEERING IN REAL LIFE

Marli **Moreira***
 University of Porto
MATH@XXI: AN INCLUSIVE COMPETITION FOR MATHEMATICS ENCULTURATION





Susanne **Tak***, Michiel **Doorman**

Utrecht University

MATHEMATICS B-DAY: A TEAM COMPETITION FOR UPPER SECONDARY EDUCATION

Batkhuu **Tserennadmid***

Mongolian State University of Education

MATHEMATICS COMPETITION PROBLEM SOLVING KNOWLEDGE AND SKILLS IN
PRE-SERVICE MATHEMATICS TEACHER EDUCATION

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 31 – Language and communication in mathematics education

P

Masato **Ando***

Tokyo University of Science

STUDY ON THE GUIDANCE TO INCREASE THE POWER OF EXPRESSION IN
MATHEMATICAL COMMUNICATION THROUGH THE SGE

Ayla Ata **Baran***, Tangül Uygur **Kabael**

Anadolu University

A MATHEMATICS TEACHER'S AND A PRE-SERVICE MATHEMATICS TEACHER'S
MATHEMATICAL DISCOURSE

Gemma **Carotenuto***, Roberto **Capone**, Cristina **Coppola**, Flora **del Regno**, Umberto **Dello Iacono**,
Laura **Lombardi**, Tiziana **Pacelli**, Francesco Saverio **Tortoriello**

Università di Salerno

NUMERO ERGO SUM: A PROPOSAL FOR THE IMPROVEMENT OF REPRESENTATION
CAPABILITY

Regina **Essack***

University of Witwatersrand

EXPLORING GRADE 11 DISCOURSES ON FUNCTION

Akiyo **Higashio*** (1), Madoka **Koyama** (2), Moe **Miyazaki** (3)

1: Education Board of Osaka Prefecture; 2: Hirano-minami Elementary School;

3: Kujo-tonan Elementary School

LEARNING A RELATIONSHIP BETWEEN 2 QUANTITIES BY LINGUISTIC EXPRESSIONS

Alexandra **Hjelte***

Örebro University

QUESTIONS AS OPPORTUNITIES FOR MATHEMATICAL REASONING

Minoru **Ito*** (1), Tetsuya **Kobayashi** (2)

1: Tokyo University of Science; 2: Ryugasaki Daiichi High School

HOW WORKS SUPPER SCIENCE HIGH SCHOOL CURRICULUM USING JAPANESE
TRADITIONAL MATHEMATICS: WASAN

Nadine **Krosanke***

Universität Hamburg

PREPARING FUTURE MATHEMATICS TEACHERS TO WORK IN LINGUISTICALLY DIVERSE
CLASSROOMS

Phattaraphong **Kunseeda***, Narumon **Changsri**
Khon Kaen University

STUDENTS' WRITING SKILL IN MATHEMATICAL PROBLEM SOLVING CLASSROOM

Woong **Lim*** (1), Paula **Guerra** (2), Jihye **Kim** (2)

1: University of New Mexico; 2: Kennesaw State University

USING PROGRAMMING LANGUAGE TO BETTER UNDERSTAND MATHEMATICAL SYMBOLS, SYNTAX, AND NOTATIONS

Saeed **Manshadi***

UiT – The Arctic University of Norway

CONTEXT AS MEAN FOR COMMUNICATION IN MATHEMATICS CLASSROOMS

Mila **McMackin***, Luis Felipe **Perez**

Gimnasio Campestre

...BUT, MATH IS JUST NUMBERS AND THOSE ARE THE SAME IN ANY LANGUAGE:
AN INVESTIGATION INTO THE ROLE OF LANGUAGE IN MATHEMATICS

Abdelhafid **Mokrane***

Ecole Normale Supérieure

THE EVOLUTION OF THE LANGUAGE OF MATHEMATICS TEACHING IN ALGERIA AFTER INDEPENDENCE (1962)

Jhonel **Morvan***

Brock University

UNDERSTANDING SCHOOL LEADERS' DISCOURSE IN REGARD TO MATHEMATICS ACHIEVEMENT

Rolf **Oechsler***, Jürgen **Roth**

Universität Koblenz-Landau

STUDENTS' COMMUNICATION IN A MATH LAB – A QUALITATIVE ANALYSIS

Chunyoung **Oh*** (1), Heesook **Park** (2)

1: Chonnam National University; 2: Suncheon National University

MATHEMATICAL COMMUNICATION IN THE LEARNING: MIDDLE AND LOW ACHIEVEMENT STUDENTS

Toril Eskeland **Rangnes***, Rune **Herheim**

Bergen University College

DISCUSSING RISK AND PROBABILITY – MORE THAN NUMBERS

Carina **Rauf***, Babara **Schmidt-Thieme**

Universität Hildesheim

GAINING LANGUAGE AWARENESS: A CURRICULUM FOR LANGUAGE AND LANGUAGE TEACHING FOR TEACHERS OF MATHEMATICS

Kirsten **Spahn***, Birgitte **Henriksen**

University College Copenhagen

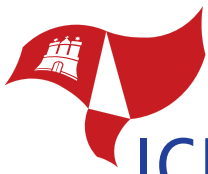
LEARNING TO READ MATHEMATICAL TEXTS

Alexander Lee-Heng **Tai*** (1), Belinda P. **Edwards** (2)

1: Columbia Public Schools – English Language Learners Department; 2: Kennesaw State University – College of Science and Mathematics

PROMOTING ACADEMIC LITERACY DURING MATHEMATICS ACTIVITY





Mio **Yamamoto***

Graduate School of Education

AN EPISTEMOLOGICAL CONFLICT IN THE SOCIAL INTERACTION: A CASE STUDY OF FRACTION LESSONS IN A THIRD GRADE CLASSROOM

Vivica **Zweidar***

University of Bremen

IMPLICIT COMMUNICATION IN CLASSROOM CONVERSATION ABOUT FUNCTIONS

Time: Friday, 29 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 32 – Mathematics education in a multilingual and multicultural environment

Valeria **Di Martino***

University of Turin

ENHANCE PROBLEM SOLVING AND ARGUMENTATION IN ITALIAN MULTICULTURAL CLASSROOMS

Hilja **Huru***, Anita Movik Simensen

UiT – The Arctic University of Norway

SECOND LANGUAGE IMMERSION IN MATHEMATICS FOR ENDANGERED LANGUAGES

Taha **Kuzu***, Alexander **Schüler-Meyer**, Susanne **Prediger**, Lena **Wessel**

Technical University Dortmund

FOSTERING BILINGUAL LEARNERS – ARE HOME LANGUAGES REALLY RESOURCES, EVEN IF NOT USED FOR MATHEMATICS BEFORE?

Balarabe **Yushau*** (1), M. Hafidz **Omar** (2), Yusuf **Zakariya** (2)

1: Abubakar Tafawa Balewa University; 2: King Fahd University of Petroleum and Minerals

RESULTS OF THE ENGLISH-ARABIC AND ARABIC-ENGLISH MATHEMATICS EXAMS OF BILINGUAL ARAB UNIVERSITY STUDENTS

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 33 – Equity in mathematics education (including gender)

Suzanne Beth **Antink***

Palo Alto Unified School District

CONTRIBUTING REPLICABLE FACTORS IN K-12 FEMALE STUDENT MATHEMATICS SUCCESS IN THE PALO ALTO UNIFIED SCHOOL DISTRICT

Neila **de Toledo e Toledo***

Instituto Federal de Educação

A BRAZILIAN TECHNICAL AGRICULTURAL SCHOOL, ITS MATHEMATICS EDUCATION AND SOCIAL INEQUALITIES

Susan **Holloway***

Saint Vrain Valley School District

EVIDENCE OF AND RESPONSES TO LANGUAGE LEARNING ADOLESCENT GIRL'S MATH ACHIEVEMENT: THE "OPHELIA EFFECT" IN COLORADO

Ji-Eun **Lee** (1), Jinho **Kim*** (2), Woong **Lim** (3), Sang-Mee **Kim** (4)

1: Oakland University; 2: Daegu National University of Education; 3: University of New Mexico;
4: Chuncheon National University of Education

A CROSS-NATIONAL STUDY OF CONCEPTUALIZING EQUITABLE MATHEMATICS CLASSROOMS

Inge **Koch***, Janine **McIntosh**, Michael **O'Connor**

Australian Mathematical Sciences Institute

CHOOSE MATHS: AN AUSTRALIAN APPROACH TOWARDS INCREASING THE PARTICIPATION OF WOMEN IN MATHEMATICS

Luis **Leyva***

Vanderbilt University – Peabody College

BLENDING ACADEMIC AND SOCIAL SUPPORT THROUGH APOYO AND CONSEJOS FOR UNDERGRADUATE MATHEMATICS SUCCESS AMONG LATIN@S

Daouda **Sangare***

Nangui Abrogoua University of Abidjan

GENDERS DIFFERENCES IN MATHEMATICS PERFORMANCE IN SUB – SAHARIAN FRANCOPHONE COLLEGES AND UNIVERSITIES, THROUGH THE PAN

Time: Friday, 29 July 2016, 18.00– 19:00 / Location: E: mint, Economical Building, foyer

TSG 34 – Social and political dimensions of mathematics education

Ana **Ferreras***

U.S. Academy of Sciences

THE U.S. NATIONAL COMMISSION ON MATHEMATICS INSTRUCTION

Emelie **Kenney***

Siena College

POLISH MATHEMATICS RESEARCH AND DIDACTICS: WHY AMERICAN (AND OTHER) STUDENTS SHOULD KNOW ITS HISTORY

Mary **Raygoza***

University of California

QUANTITATIVE CIVIC LITERACY

Miho **Yamazaki***

University of Tsukuba

A FRAMEWORK OF SOCIOCULTURAL CHARACTERISTICS OF MATHEMATICAL VALUES

Time: Tuesday, 26 July 2016, 18.00– 19:00 / Location: E: mint, Economical Building, foyer

TSG 36 – Task design, analysis and learning environments

Andreja **Drobnic Vidic***

University of Ljubljana

STUDENTS' AND TEACHERS' DIFFICULTIES IN DEALING WITH REALISTIC TASKS





Laurie **Jacques***

UCL – Institute of Education

LEARNING TO APPLY VARIATION THEORY TO THE DESIGN OF MATHEMATICAL TASKS IN ENGLISH PRIMARY CLASSROOMS

Ellen **Jameson***, Daniel T. **Hickey**

University of Cambridge

IMPROVING SUPPORT FOR MULTIPLE REPRESENTATIONS IN A BASE-TEN NUMBER SYSTEM GAME: THE ROLE OF ASSESSMENT IN DESIGN

Solveig **Jensen***

Universität Osnabrück

A MATHEMATICAL PLAYWORLD FOR SUPPORTING CHILDREN TAKING UP A PROCESS VIEW WHEN DEALING WITH NATURAL NUMBERS

Luis Alberto **López-Acosta***, Gisela **Montiel**

Centro de Investigación y de Estudios Avanzados del Instituto politécnico Nacional (Cinvestav del IPN)
VARIATIONAL THINKING AND LANGUAGE – A DESIGN-BASED SOCIOEPISTEMOLOGICAL RESEARCH

Hitoshi **Matsukawa***

Graduate School of Education

DESIGNING MATHEMATICAL ACTIVITIES BASED ON THE SELF-DEVELOPED MODEL IN HIGH SCHOOL: THE HANOI TOWER AS AN EXAMPLE

Linda G. **Opheim***

University of Agder

DVM-U – A TECHNOLOGICAL ENVIRONMENT DESIGNED TO AID ADAPTED TEACHING AND MOTIVATE PUPILS

Cynthia **Pulido***, Breanne **Ulloa**, Christina **Perez**, Cristina **Cortes**

California State University

USING COLLECTIONS TO HELP STUDENTS UNDERSTAND THE VALUE OF DIGITS

Yury **Rojas***

New York University

A REVIEW OF RECENT RESEARCH IN FRACTION MULTIPLICATION; IMPLICATIONS FOR TASK DESIGN.

Meetal **Shah***, Jere **Confrey**

North Carolina State University

MIDDLE GRADES STUDENTS' INTERPRETATIONS OF ADDITION OF FRACTIONS USING AN INTERACTIVE NUMBER LINE

Sharon **Walker***, Tatiana **Rostovtseva**

Faculty of Mathematics

CAMBRIDGE MATHEMATICS EDUCATION PROJECT: DEVELOPING A FRAMEWORK FOR 'DEEP' UNDERSTANDING IN KEY STAGE 5 MATHEMATICS

Petra **Scherer**, Kristina **Hähn**, Christian **Rütten**, Stephanie **Weskamp***

Universität Duisburg-Essen

SUBSTANTIAL LEARNING ENVIRONMENTS FOR HETEROGENEOUS GROUPS – FOURTH GRADERS EXPLORE MATHEMATICS AT THE UNIVERSITY

Wing Yee Angela **Yung***
VMI

HAVING "FUN" IN MATHEMATICS LESSONS: TWO EXAMPLES IN HONG KONG

Time: Friday, 29 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 37 – Mathematics curriculum development

Ekrem **Alimi*** (1), Aferdita **Aljimi** (2)

1: University of Gjilan "Kadri Zeka"; 2: Lower and Primary School

COMPARATION OF DIFFERENT MEANINGS OF FUNCTION BASED ON SCHOOL
MATHEMATICS TEXTBOOKS

Sooil **Choi*** (1), Bo Hyeon **Kim** (2), Moonhwan **Park** (3), Kyung Eun **Lee** (4), Hyungshin **Kim** (5),
Junga **Yi** (6), Junhee **Han** (7)

1: Mathematics Education Research Institute(Korea); 2: Dongsung Middle School;

3: Seoul Nat'l Univ. Middle School; 4: Seoul Nat'l Univ. Middle School; 5: Sinchang Middle School;

6: Seongbok High School; 7: Yushin High School

INTERNATIONAL COMPARISON OF MATHEMATICS CURRICULUM OF SOUTH KOREA AND
OTHER COUNTRIES

Satoshi **Fujinawa***

Tokyo University of Science

INQUEST OF INTRODUCTION MATHMATIC IN EDUCATIONAL CONTINUITY FROM
PRIMARY THROUGH EARLY ECONDARY LEVELS

Fumi **Ginshima*** (1), Keiko **Hino** (2)

1: National Institute for Educational Policy Research; 2: Utsunomiya University

CONTRIBUTION OF ASSESSMENT TO THE PROCESS OF CURRICULUM DESIGN:
AN EXPERIENCE IN JAPAN

Penina Adhiambo **Kamina***

SUNY Oneonta

A BEFITTING MATHEMATICS CURRICULUM FOR THE 21ST CENTURY

Luís **Menezes***

Higher School of Education of Viseu

HUMOR IN MATHEMATICS TEACHING

Amirali **Momenzadeh***, Jamal **Mahmoudi**

Shahid Beheshti University

THE ROLE OF CALCULATOR IN NEW MATHEMATICS CURRICULUM IN IRAN

Shogo **Murata***

University of Tsukuba

THE PLACE OF "MATHEMATICAL METHOD" IN THE SCHOOL MATHEMATICS
CURRICULUM

Mario **Schmitz***

Eberswalde University for Sustainable Development

AN APPROACH FOR AN INDUCTIVE CURRICULUM DESIGN





Yiting **Yu***

Beijing Bayi School

THE INFLUENCE OF TYPES OF HOMEWORK ON OPPORTUNITY TO LEARN AND STUDENTS' MATHEMATICS ACHIEVEMENT

**Time: Friday, 29 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 38 – Research on resources (textbooks, learning materials etc.)**

María Selene Georgina Chávez **Rodríguez***, Hugo Adán Cruz **Suárez**, José Antonio Juárez **López**
Benemérita Universidad Autónoma de Puebla

EXPLORING THE AUTHENTICITY OF A VERBAL PROBLEM FROM THE PERSPECTIVE OF TOPOGRAPHY ENGINEERS

Sanskar **Dhakal*** (1), Durga Prasad **Dhakal** (2)

1: Kathmandu Satpragya School; 2: Kathmandu University

RUBIK'S CUBE AND SCHOOL MATHEMATICS

Laura **Delgado** (1), María Asunción García **Olivares*** (2), María Consuelo Monterrubio **Pérez** (3)

1: University of Salamanca; 2: University of Valladolid; 3: University of Salamanca

MOVIES AND MATHEMATICAL COMPETENCE: DESIGNING CURRICULAR MATERIALS

Miguel A. **Marco-Buzunáriz**, Jose M. **Muñoz-Escolano***

Universidad de Zaragoza

RESEARCH ON TEXTBOOKS AT SPANISH SOCIETY FOR RESEARCH IN MATHEMATICS EDUCATION SIMPOSIA (1997–2015)

Inga **Niedermeyer***, Ann-Katrin **van den Ham**, Aiso **Heinze**

Leibniz Institute for Science and Mathematics Education Kiel

EFFECTS OF TEXTBOOKS ON MATHEMATICS TEACHING AND LEARNING IN GERMAN PRIMARY SCHOOLS

Heather **Gallivan** (1), Jihwa **Noh*** (2)

1: University of Northern Iowa; 2: Pusan National University

ANALYZING CONTEXTS USED IN TEXTBOOK PROBLEMS ON FRACTION MULTIPLICATION

Valdinei **Cardoso** (2), Lilian **Kato** (2), Samuel **Oliveira*** (1)

1: University of Campinas; 2: University of Maringá

WHAT A SEMIOTICS THEORY OF REGISTERS REPRESENTATION TELLS US ABOUT SOME LINEAR ALGEBRA'S TEXTBOOKS?

Kristina Palm **Kaplan***

Uppsala University

CONTEXTS AND LEARNER POSITIONS VARYING WITH CONTENT

Maximilian **Pohl***

Universität Duisburg-Essen

ANALYSING STUDENTS' USES AND THE DESIGN OF DIGITAL TEXTBOOKS

Xinming **Wang***

College of Mathematics and Information Science

THE BASIC CONNOTATION OF LEARNING DESIGN

Time: Friday, 29 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 39 – Large scale assessment and testing in mathematics education

Maryam **Bahalouhoureh***, Hadis **Mohamadi**
 Shahid Beheshti University
 4TH GRADE IRANIAN STUDENTS' UNDERSTANDING OF FRACTIONS

Georg **Bruckmaier*** (1), Stefan **Krauss** (1), Werner **Blum** (2), Dominik **Leiss** (3)
 1: University of Regensburg; 2: University of Kassel; 3: Leuphana University Lüneburg
 MEASURING TEACHERS' PROFESSIONAL COMPETENCE BY USING VIDEO CLIPS

Johan **Deprez***, Daniël **Van Nijlen**, Eef **Ameel**, Rianne **Janssen**
 University of Leuven
 LARGE SCALE ASSESSMENT OF ATTAINMENT TARGETS ON UPPER SECONDARY LEVEL
 MATHEMATICS IN FLANDERS (BELGIUM)

InAh **Hwang***, Hyunju **Kim**, Won Kyung **Kim**
 Korea National University of Education
 A STUDY ON MAJOR CAUSES OF INFLUENCING KOREAN STUDENTS' AFFECTIVE
 CHARACTERISTICS IN MATHEMATICS BY A BIG DATA ANALYSIS

Israel **Inekwe***
 Michael Okpara University of Agriculture
 CREATIVE ANALYSIS AND EQUIVALENT COMPARTMENTALIZATION OF THE AH4

Jitlada **Jaikla***, Sukanya **Thammanoonluk**, Narumon **Changsri**, Maitree **Inprasitha**
 Khon Kaen University
 A STUDY OF STUDENTS' MATHEMATICS COMPETENCY: A PILOT STUDY IN THAILAND

Alison **Reddy***
 University of Illinois
 THE UNIVERSITY OF ILLINOIS ASSESSMENT AND PLACEMENT PROGRAM

Anselm R. **Strohmaier***, Jana T. **Beitlich**, Matthias C. **Lehner**, Kristina M. **Reiss**
 TU Munich
 THE AGE OF THE CAPTAIN – ADULTS' FOCUS ON NUMBERS IN PISA ITEMS

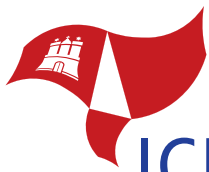
Da **Zhou***, Qimeng **Liu**, Jian **Liu**
 Beijing Normal University
 SELF-EFFICACY AND MATHEMATICS ACHIEVEMENT: AN EXPLORATORY STUDY

Time: Friday, 29 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 40 – Classroom assessment for mathematics learning

Mari **Chikvaidze*** (1,2), Syed K. **Husain** (2), James **Underwood** (3)
 1: King's College London; 2: Lampton Academy; 3: University of Northampton
 ASSESSMENT FOR LEARNING USING MULTIPLE CHOICE QUESTIONS

Erol **Karakirik** (1), Mustafa **Dogan*** (2), Orhan **Canakci** (3)
 1: Abant Izzet Baysal University; 2: Yildiz Technical University; 3: Marmara University
 ANATOMY OF A GENERIC QUESTION MODEL IN DINASORUS ASSESSMENT SYSTEM





Ann **Downton***

Monash University

USING A DIGITAL FLIP CAMERA AS AN ASSESSMENT TOOL IN A
MATHEMATICS LESSON

Elodie **Ho***

California State University

STANDARDS AND DISPOSITION ASSESSMENT

Chia-Jui **Hsieh***

National Taiwan Normal University

CONCEPT IMAGES FOR FORMATIVE ASSESSMENT OF MATHEMATICS INTERN
TEACHERS IN TAIWAN

Renate **Nitsch***, Regina **Bruder**

TU Darmstadt

ANALYSIS OF STUDENTS' ERROR PATTERNS IN THE FIELD OF FUNCTIONS

Victor **Odafe***

Bowling Green State University Firelands

HISTORY OF ASSESSMENT IN MATHEMATICS

Márcio **Pironel*** (1), Lourdes **de la Rosa Onuchic** (2)

1: IFMG – Formiga and UNESP – Rio Claro; 2: UNESP – Rio Claro

SEARCHING PRINCIPLES FOR THE ASSESSMENT OF MATHEMATICS LEARNING

Angela **Piu*** (1), Cesare **Fregola** (2)

1: University of Valle D'Aosta; 2: University of L'Aquila

UNDERSTANDING OF MATHEMATICAL CONCEPTS AND TRANSCODING PATTERN
TOWARDS A FUZZY ASSESSMENT MODEL.

Ulrike **Roder***, Nora **Feldt-Caesar**

Technische Universität Darmstadt

DIAGNOSIS AND SUPPORT OF BASIC MATHEMATICAL KNOWLEDGE AT THE BEGINNING
OF UPPER SECONDARY SCHOOL (GERMAN GYMNASIUM)

Elvira Lazaro **Santos***

Escola Básica 2º e 3º ciclos de Álvaro Velho

ASSESSMENT FOR LEARNING PRATICES AND TEACHING REGULATION

José Abel **Semitiel***, Cintia Georgina **Cianciardo**, Angélica Rosa **Arnulfo**

Facultad de Ciencias Exactas

DIFFICULTIES OBSERVED IN THE PROCESS OF STUDYING THE CONCEPT OF LINEAR
INDEPENDENCE

Yvonne **Su***

California State University

ASSESSING MATHEMATICAL UNDERSTANDING USING MANIPULATIVES

Joann **Sur***, Lisa **Byeon**

California State University

CORRELATION BETWEEN STUDENT ACHIEVEMENT AND ATTITUDE

Iva **Žlábková***

University of South Bohemia in České Budejovice

PEER ASSESSMENT IN INQUIRY BASED MATHEMATICS EDUCATION

Time: Friday, 29 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 41 – Uses of technology in primary mathematics education (up to age 10)

Leonor **Camargo*** (1), Ivonne **Sandoval** (2)

1: Universidad Pedagógica Nacional; 2: Universidad Pedagógica Nacional

APPROACHING THE THEORETICAL WORLD OF GEOMETRY IN FIFTH GRADE

Khristin **Fabian***

University of Dundee

IMPLEMENTATIONS OF MOBILE LEARNING IN MATHEMATICS

Ben Pierre Emile **Haas*** (1), Romain **Martine** (2), Yves **Kreis** (3)

1: Menje; 2: Lucet; 3: Uni.lu

IMPROVING THE SKILL LEVELS IN THE DOMAIN OF RESOLUTION OF ARITHMETIC PROBLEMS, TESTED BY NATIONAL STANDARDIZED TESTS (EP)

Heidi **Otto***

Universität Hildesheim

SCRATCH IN PRIMARY SCHOOLS. APPROCHING A FUNDAMENTAL IDEA BY PROGRAMMING

Jin **Sunwoo*** (1), JeongSuk **Pang** (1), Kyuha **Lee** (2)

1: Korea National Univ. of Education (KNUE); 2: WEDU Communications

THE DEVELOPMENT OF ELECTRONIC BOOKS OF PRIMARY MATHEMATICS VIA FREE CHOICE INFORMAL LEARNING

Erich Ch. **Wittmann***

Technical University of Dortmund

COUNTERS & CO. DIGITALLY. A UNIVERSAL SOFTWARE FOR PRIMARY MATHEMATICS

Time: Friday, 29 July 2016, 18.00–19:00 / Location: E: mint, Economical Building, foyer
TSG 42 – Uses of technology in lower secondary mathematics education (age 10 to 14)

Mieke **Abels***

Freudenthal Institute

DEVELOPING A DIGITAL MATHEMATICS ENVIRONMENT IN INTERACTION WITH (DESIGN) RESEARCH

Charles **Anifowose***, Angelica **Mendaglio**

Vretta Inc.

MATHEMATIC: A DATA-DRIVEN CLASSROOM WITH DIGITAL MATH PEDAGOGY

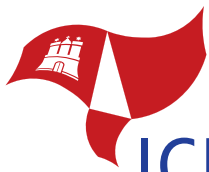
Adrian **Bull***, Arne **Mogensen**

VIA University College

INCREASED LEARNING OUTCOME FOR BOYS USING CAS IN MIDDLE SCHOOL

P





Eden Chavez **De Joya***

Philippine Science High School

INTEGRATING GEOGEBRA AND DESMOS IN ALGEBRA CLASSES IN PHILIPPINE SCIENCE HIGH SCHOOL

Carlos **Valenzuela** (1,2), David **Arnau** (2), Olimpia **Figueras*** (1), Juan **Gutiérrez** (2)

1: Centro de Investigación y de Estudios Avanzados del IPN; 2: Universitat de València
DESIGNING APPLETS FOR TEACHING FRACTIONS

Klaus-Tycho **Foerster***

ETH Zurich

PROGRAMMING AS AN EVERYDAY TOOL IN MATHEMATICAL EDUCATION

Daysi Julissa **García Cuéllar***, Jesús Victoria **Flores Salazar**

Pontificia Universidad Católica del Perú

THE INSTRUMENTATION OF THE AXIAL SYMMETRY IN HIGH SCHOOL STUDENTS

Iwan **Gurjanow***, Matthias **Ludwig**

Goethe University Frankfurt am Main

USING THE MATHCITYMAP-APP TO EXAMINE THE IMPACT OF GAMIFICATION ON INTRINSIC MOTIVATION

Meritxell **Joanpere***, Lluís **Albarracín**

Universitat Autònoma de Barcelona

DESIGNING MATHEMATICAL ACTIVITIES FROM A VIDEOGAME

Kyung-Eun **Lee***

Seoul National University Middle School

MATHEMATICS LEARNING ENVIRONMENT FOR COMPUTATIONAL THINKING BASED ON EXECUTABLE EXPRESSIONS AND 3D PRINTERS

Feng-Lin **Lu***, Tai-Yih **Tso**, Shih-Ying **Yen**

National Taiwan Normal University

THE EFFECTS OF SELF-MANIPULATION FOR DEVELOPING EIGHTH GRADERS' VAN HIELE LEVELS IN DYNAMIC GEOMETRY ENVIRONMENTS

Vanessa **Oechsler*** (1), Marcelo **de Carvalho Borba** (2)

1: Instituto Federal de Santa Catarina – Câmpus Gaspar; 2: Universidade Estadual Paulista

Julio de Mesquita Filho

THE PRODUCTION OF VIDEOS IN MATHEMATICS EDUCATION

Helia **Oliveira*** (1), Ana Isabel **Mota** (2), Ana **Henriques** (1)

1: University of Lisbon; 2: University of Minho

STUDENTS' PERSPECTIVES ABOUT EXPLORING STATISTICS WITH TINKERPLOTS SOFTWARE: SOME CONNECTIONS WITH STUDENTS' RESILIENCE

Deniz **Özen***, Ersen **Yazici**, Taner **Arabacioglu**

Adnan Menderes University Faculty of Education

TYPES OF MOBILE APPS TOWARDS MATHEMATICS: A QUALITATIVE STUDY

Oliver **Thiel*** (1), Yvonne **Grimeland** (1), Joel **Josephson** (3), Jörn **Loviscach** (4), Nelly **Kostova** (5),

Piedade **Vaz-Rebello** (6), Marco **Jessat** (2), Armin **Hottmann** (2)

1: Queen Maud University College; 2: Kulturring e.V.; 3: Kindersite; 4: Bielefeld University of Applied Sciences; 5: School "Sv.Kliment Ohridski"; 6: University of Coimbra

VIDUMATH – CREATIVE VIDEO FOR MATHEMATICS

Ian **Willson***

None

USING THE WOLFRAM LANGUAGE TO WORK WITH DATA

Time: Friday, 29 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 43 – Uses of technology in upper secondary mathematics education (age 14 to 19)

Ma. Louise Antonette Navarro **De Las Penas*** (1), Debbie Marie **Verzosa** (2)

1: Ateneo de Manila University; 2: Ateneo de Davao University

THE USE OF DYNAMIC TOOLS FOR GRADES 7-10 MATHEMATICS IN THE CONTEXT OF A DEVELOPING COUNTRY

Houssam **EIKasti***

Lebanese University

EFFECT OF GEOGEBRA PROFESSIONAL DEVELOPMENT ON INSERVICE SECONDARY MATHEMATICS TEACHERS' TECHNOLOGY INTERGATION LEVEL

Jorge **Gaona***

Université Paris 7 Diderot – Paris 7

ANALYSIS OF THE ELABORATION OF BASE E-EXERCISES IN FUNCTIONS

Janelle **Hill***

Monash University

IPADS IN MATHEMATICS EDUCATION – VIEWS OF STUDENTS

Jin-ichi **Itoh***

Kumamoto University

SOME STUDIES OF HEURISTIC LEARNING OF PLANE GEOMETRY WITH ICT

Chiharu **Kanamori***

Shibaura Institute of Technology Junior and Senior High School

ICT EDUCATION PROBLEMS ACCORDING TO SURVEY FINDINGS AND SUGGESTIONS FOR A NEW CLASS STYLE

Daisuke **Koda***

Shibaura Kashiwa Senior and Junior High School

THE USE OF ICT LIKE GEOGEBRA IN THE MATHEMATICAL ACTIVITY

Matthias **Müller***

Friedrich-Schiller-Universität Jena

CAS CLASSROOM AND STUDENT CENTERED LEARNING ENVIROMENT IN THURINGIA

Santosh **Paudel*** (1), Pundary **Phuyal** (2), Deependra **Budhathoki** (3)

1: Kathmandu University; 2: Kathmandu University; 3: Kathmandu University

THE USE OF ICT IN MATHEMATICS CLASSROOM

Marie **Pierard***, Valérie **Henry**

University of Namur

TEACHING TRIGONOMETRY WITH DYNAMIC GEOMETRY

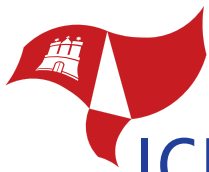
Sergio Andrés Rubio **Pizzorno***

Cinvestav

GAME OF PARAMETERS : QUADRATIC FUNCTION

P





Ian **Sheppard***
Geelong College
USING CAS TO SUPPORT STUDENT INVESTIGATION

Liliana **Suarez-Tellez*** (1), Mercy Lili **Pena-Morales** (2), Victor Hugo **Luna-Acevedo** (1), Carmen **Varela** (3)
1: Instituto Politécnico Nacional; 2: University of Victoria; 3: Colegio de Bachilleres
TECHNOLOGY AS IMPORTANT ISSUE FOR MEXICAN TEACHERS OF SECONDARY SCHOOL

Kinga **Szücs***
Friedrich-Schiller-Universität Jena
USE OF PODCASTS IN MATHEMATICS EDUCATION HAVING REGARD TO HETEROGENEITY

Christophe **Viudez*** (1), Jean-François **Nicaud** (1), Nataly **Essonier** (2), Jana **Trgalova** (2)
1: Aristod; 2: S2HEP
APLUSIX NEO: APPLICATION FOR FUN ALGEBRA PRACTICING

P

Time: Friday, 29 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 44 – Distance learning, e-learning, blended learning

William Man Yin **Cheung***
University of Hong Kong
INCORPORATING SMARTPHONES INTO TEACHING LARGE CLASS: A CASE STUDY OF
TEACHING FIRST-YEAR UNIVERSITY SCIENCE STUDENTS

Madan **Gupta***, Peter **Adams**
University of Queensland
ADAPTIVE TUTORIALS: AN E-LEARNING APPROACH FOSTERING STUDENT ENGAGEMENT
IN MATHEMATICS

Margret **Hjalmarson***, Courtney **Baker**
George Mason University
SYNCHRONOUS ONLINE COURSES FOR MATHEMATICS TEACHER LEADERS

Moonja **Jeong***
University of Suwon
A NOTE ON IMPLEMENTATION OF FLIPPED LEARNING ON CALCULUS OF ONE VARIABLE

Nilsa Adelaide Issufo Enoque **Pondja Cherinda***
Eduardo Mondlane University
TEACHING STATISTICS BY DISTANCE EDUCATION AT DIGITAL ERA:
CHALLENGES AND PERSPECTIVES

Rubén-Darío **Santiago-Acosta***, Lourdes **Quezada-Batalla**, Ernesto **Hernández-Cooper**
ITESM
MASSIVE OPEN ONLINE COURSE ON DIFFERENTIAL EQUATIONS (DE)

Alice **Seneres***, Philip **Smith**
Teachers College Columbia University
WHAT EFFECT DOES THE HYBRID COURSE FORMAT HAVE ON CLASSROOM INTERACTIONS?

Shizuka **Shirai*** (1), Tetsuo **Fukui** (2)

1: Mukogawa Women's University; 2: Mukogawa Women's University

MATHTOUCH WEB: ONLINE MATH INPUT EDITOR FOR INTERACTIVELY CONVERTING LINEAR STRINGS

Matthew **Sokol***

State University of New York – Westchester Community College

ONLINE ACCELERATED DEVELOPMENTAL MATHEMATICS

Alma Yereli **Soto Lazcano***, Víctor Hugo Luna **Acevedo**, María Reyna **Navarro García**

Instituto Politécnico Nacional

DIGITAL COMPETENCIES FOR INNOVATION: VIRTUAL LEARNING COMMUNITIES OF MATH, BIOCHEMISTRY AND FINANCIAL LITERACY

Kentaro **Yoshitomi***, Mitsuru **Kawazoe**

Osaka Prefecture University

WEB-BASED ASSESSMENT SYSTEM DEVELOPED WITH WEBMATHEMATICA

Julia **Zerlik***

Goethe-Universität

PROFESSIONAL KNOWLEDGE IN MATHEMATICS EDUCATION OF PRE-SERVICE TEACHERS IN BLENDED LEARNING COURSES

Time: Friday, 29 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer

TSG 45 – Knowledge in/for teaching mathematics at primary level

Zahra **Gooya***

Shahid Beheshti University

MATHEMATICS KNOWLEDGE NEEDED FOR ELEMENTARY TEACHERS IN IRAN

Gwen **Ineson***

Brunel University

MATHEMATICAL TALK: LINKS WITH SUBJECT KNOWLEDGE?

Jisoo **Kim***, Juri **Lee**, Soo Jin **Lee**

Korea National University of Education

TWO ELEMENTARY SCHOOL TEACHERS' KNOWLEDGE OF FRACTION MULTIPLICATIONS AND DIVISIONS WITH DRAWN REPRESENTATIONS

Tracy L. **Weston***

Middlebury College

DEVELOPING KNOWLEDGE OF REPRESENTATIONS IN INITIAL TEACHER EDUCATION

Time: Friday, 29 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer

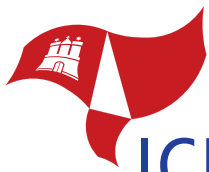
TSG 46 – Knowledge in/for teaching mathematics at secondary level

Aleksandra **Cižmešija*** (1), Ana **Kataleni** (2), Željka Milin **Šipuš** (1)

1: University of Zagreb; 2: University of Osijek

ASYMPTOTE AND ITS DIDACTIC TRANSPOSITION IN THE SECONDARY EDUCATION IN CROATIA





Patricia Rosana **Linardi*** (1), Regina **Ehlers Bathelt** (2)

1: Universidade Federal de São Paulo; 2: Universidade Federal de Santa Maria

A SET OF INSTRUMENTS TO INVESTIGATE THE PROFESSIONAL PRACTICE
OF MATHEMATICS TEACHERS: LIMITS AND POSSIBILITIES

Bernie **O'Donoghue*** (1), Patrick **Johnson** (1), Máire **Ní Ríordáin** (2), John **O'Donoghue** (1)

1: University of Limerick; 2: NUI Galway

LET'S LEARN LITERACY FOR MATHEMATICS TEACHING FROM PÓLYA AND MEYER

Diwash **Shakya***, Jeeban **Bhuju**

Glacier International College

IMAGES OF MATHEMATICS AND ACHIEVEMNET: FROM AN OUTSIDER'S VIEW

Rachel **Snider***

University of Michigan

EXAMINING THE PRACTICE OF AND KNOWLEDGE USED IN SELECTING EXAMPLES

Time: Friday, 29 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 47 – Pre-service mathematics education of primary teachers

Yukiko **Asami-Johansson***, Iiris **Attoeps**

University of Gävle

COMPARATIVE STUDY IN TEACHER EDUCATORS' PERCEPTIONS OF PCK

Johanna **Brandt***

Technical University of Dortmund

ENHANCING COMPETENCES FOR DIAGNOSIS AND INDIVIDUAL SUPPORT –
RESEARCH ON AN UNIVERSITY LEARNING ENVIRONMENT

Eugenio **Chandia***

Pontificia Universidad Católica de Chile

EFFECT OF INITIAL TEACHER EDUCATION PROGRAMS ON PRIMARY SCHOOL
TEACHERS' BELIEFS ABOUT MATHEMATICS INSTRUCTIONAL PRACTICE

Emilio Celso **de Oliveira**, Ana **Chiummo***

Universidade Paulista

TEACHER'S KNOWLEDGE: TEACHING EXPERIENCES AT GRADUATION

Emmanuel **Deogratias***

University of Dodoma

INFORMING A CONCEPT STUDY PRACTICE IN MATHEMATICS CLASS FROM
NORTH AMERICA TO TANZANIAN CONTEXT.

Lakesia L. **Dupree***

University of South Florida

THE NATURE OF THE DISCOURSE BETWEEN PRESERVICE ELEMENTARY TEACHERS
AND THEIR MATHEMATICS COACH DURING FIELD EXPERIENCES

Molly **Fisher*** (1), Edna **Schack** (2), Jonathan **Thomas** (1), Cindy **Jong** (1)

1: University of Kentucky; 2: Morehead State University

CHANGES IN PRE-SERVICE TEACHERS' ATTITUDES TOWARD MATHEMATICS:
DIFFERENCES IN TRADITIONAL AND ONLINE APPROACHES

Ulrich **Kortenkamp**, Johanna **Goral***, Ingrid **Glowinski**, Safyah **Hassan-Yavuz**,
Joost **Massolt**, Jessica **Seider**, Sandra **Woehlecke**

Universität Potsdam

IDENTIFICATION OF SPECIFIC LEVELS OF SCHOOL-RELATED CONTENT KNOWLEDGE
RELEVANT TO MATHEMATICS PRIMARY TEACHERS

Weerasuk **Kanauan***, Wipaporn **Suttiamporn**, Maitree **Inprasitha**

Khon Kaen University

MATHEMATICS STUDENT INTERNS' REFLECTING ABOUT THEIR LEARNING DURING
PRACTICUM WITH LESSON STUDY AND OPEN APPROACH

Nicole **Koppitz***

University Gießen

MATHEMATICAL ASSISTANCE IN TEACHER EDUCATION

Hege Marie **Mandt***

Østfold University College

PRE-SERVICE MATHEMATICS EDUCATION OF PRIMARY TEACHERS IN NORWAY

Yuki **Masuda***

Tokyo Seitoku University

ANALYSIS OF ELEMENTARY SCHOOL MATHEMATICS LESSONS TEACHER TRAINING
IN DAILY RECORDS

Antonella **Montone***, Eleonora **Faggiano**, Michele **Fiorentino**, Michele **Pertichino**

University of Bari Aldo Moro

PRE-SERVICE PRIMARY TEACHERS DEALING WITH FRACTIONS: A SEMIOTIC MEDIATION
PERSPECTIVE FOR ADULT LEARNERS

Alisa **Moonsri*** (1), Maitree **Inprasitha** (2), Narumon **Changsri** (3)

1: Doctoral Program in Mathematics Education; 2: Center for Research in Mathematics Education;

3: Center for Research in Mathematics Education

PRE-SERVICE TEACHER' PERSPECTIVE ON LESSON PLAN

Annabell **Ocken***

TU Dortmund

REGISTERS OF COMPETENCES IN PRE-SERVICE EDUCATION OF PRIMARY TEACHERS –
USAGE AND ACCEPTANCE

Maria **Ricart***, Maria José **Gros**, Assumpta **Estrada**

Universitat de Lleida

ANALYSIS OF CONCEPTUAL MAPS FOR THE ASSESSMENT OF PROPORTIONALITY
KNOWLEDGE OF FUTURE PRIMARY TEACHERS

Adriana **Richit*** (1), Marilane **Wolff Paim** (2), Mauri Luís **Tomkelski** (3)

1: Universidade Federal da Fronteira Sul; 2: Universidade Federal da Fronteira Sul;

3: Universidade Federal da Fronteira Sul

MATHEMATICAL EDUCATION OF TEACHER TO LEARNING IN EARLY YEARS
OF ELEMENTARY SCHOOL

Peder **Rostgaard***, Arne **Mogensen**

VIA University College

LESSON STUDY AS FRAMEWORK FOR GUIDANCE MEETINGS IN TEACHING PRACTICE





Time: Friday, 29 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 48 – Pre-service mathematics education of secondary teachers

Linda Ann **Arnold***

Monmouth University

USING LESSON STUDY WITH PRE-SERVICE SECONDARY MATHEMATICS TEACHERS
IN EARLY FIELD PLACEMENT EXPERIENCES

Matthias **Böckmann***, Stanislaw **Schukajlow**, Janina **Krawitz**

Institut für Didaktik der Mathematik und Informatik

PRE-SERVICE TEACHERS' JUDGEMENTS OF STUDENTS' UNREALISTIC SOLUTIONS

Matías **Camacho-Machín*** (1), Mar **Moreno** (2), María Candelaria **Afonso** (1), María Teresa **González** (3)

1: University of La Laguna; 2: University of Alicante; 3: University of Salamanca

TASKS PROBLEM SOLVING WITH DIGITAL TOOLS FOR PRE-SERVICE SECONDARY SCHOOL
TEACHERS: WHAT TYPE OF TASKS SHOULD BE USED?

Patrizia **Enenkiel***, Jürgen **Roth**

University of Koblenz-Landau

DIAGNOSIS OF GEOMETRIC CONCEPTUALIZATIONS OF STUDENTS

Viktor **Isaev***, Andreas **Eichler**

Universität Kassel

BRIDGING OF MATHEMATICS AT UNIVERSITY LEVEL AND SCHOOL MATHEMATICS
IN SECONDARY TEACHER EDUCATION

Gladis **Kersaint***, Ruthmae **Sears**

University of South Florida

PARTNERSHIP TO DESIGN A MIDDLE SCHOOL MATHEMATICS TEACHER PREPARATION
PROGRAM WITH EXTENSIVE CLINICAL EXPERIENCES

Sharon **McCrone*** (1), Timothy **Fukawa-Connelly** (2), May **Chaar** (3)

1: University of New Hampshire; 2: Temple University; 3: Framingham State University

SITUATING PRESERVICE TEACHER EDUCATION IN THE WORK OF TEACHING

Itgel **Miyevjav*** (1), Buyantogtokh **Dashnamjil** (2)

1: National University of Mongolia; 2: Mongolian State University of Mongolia

THE MODEL FOR PROFESSIONAL KNOWLEDGE OF MATHEMATICS TEACHERS
OF MONGOLIA

Anna Barbara **Orschulik***, Katrin **Vorhölter**

University of Hamburg

STRENGTHENING COOPERATION WITHIN SCHOOL PRACTICAL ACTIVITIES AS A WAY
TO IMPROVE TEACHER EDUCATION

Jeongmin **Park***

Cal State University Long Beach

COMPARISON OF MATHEMATICS CREDENTIAL PROGRAM AND CURRICULUM
IN SECONDARY EDUCATION: SOUTH KOREA AND UNITED STATES

Klaus **Rasmussen***

Metropolitan University College

CONSECUTIVE CYCLES OF "WHOLE CLASS" LESSON STUDY

Sigal-Hava **Rotem***

Weizmann Institute of Science

FACILITATING VIDEO-BASED WORKSHOPS FOR PRE-SERVICE MATHEMATICS TEACHERS:
A CASE STUDY

Deborah **Tully***, Judy **Anderson**, Leon **Poladian**

University of Sydney

IMPROVING RETENTION OF PRE-SERVICE TEACHERS THROUGH EXPANDING
COMMUNITIES OF PRACTICE

Jeannette **Vargas*** (1), José Eduardo **Novoa** (2), Maureen **Castañeda** (2)

1: Universidad Colegio Mayor de Cundinamarca; 2: Universidad Pedagógica Nacional

CHARACTERIZING WITH THE CONTENT DIDACTIC KNOWLEDGE NOTION:
CONSTRUCTION OF THE LOGARITHMIC FUNCTION GRAPHIC REPRESENTATI

Moritz **Walz***, Jürgen **Roth**

University of Koblenz-Landau

DIAGNOSTIC COMPETENCE AND THE DEVELOPEMENT OF LEARNING ENVIRONMENT

Time: Friday, 29 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer

TSG 49 – In-service education and professional development of primary mathematics teachers

Sneha **Bhansali***, Jihyun **Hwang**, Kyong Mi **Choi**

University of Iowa

EFFECTS OF A PROFESSIONAL DEVELOPMENT PROGRAM ON CRITICAL THINKING
SKILLS OF FIFTH-GRADE STUDENTS

Elke **Binner***, Katja **Eilerts**

Deutsches Zentrum für Lehrerbildung Mathematik (DZLM)

PROFESSIONAL QUALIFICATION CONCEPTUALLY COMBINED
WITH LESSON DEVELOPMENT

Sebastian **Friedl***, Simone **Reinhold**

Universität Leipzig

INTERACTIVE VIDEO-SIMULATION TO TRACE DIAGNOSTIC STRATEGIES OF TEACHERS
AND PRE-SERVICE TEACHERS: A PROMISING APPROACH?

Maggie **Hackett***

University of Arizona

WHAT AND HOW TEACHERS NOTICE IN STUDENTS' SMALL GROUP INTERACTIONS

Reinhold **Haug***

University of Education

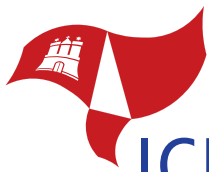
TOWARDS A GREATER PROFESSIONALISM OF PRIMARY TEACHER AND
KINDERGARTEN EDUCATOR USING THE EXAMPLE OF THE MATHELINOPROJECT

Bik Kwan **Ip***

S.T.F.A. Lee Kam Primary School

MATHEMATICS TEACHERS' LEARNING CIRCLE IN A HONG KONG PRIMARY SCHOOL





Saastra **Laah-On*** (1), Sampan **Thinwiangthong** (1), Maitree **Inprasitha** (1,2)

1: Faculty of Education; 2: Center for Research in Mathematics Education

EMERGENT OF COGNITIVE DISSONANCE BY ANOTHER TEACHERS' CLASSROOM VIDEO

Sijia **Zhu**, Douglas **McDougall***, Ying **Chen**

University of Toronto

RECIPROCAL LEARNING BETWEEN CANADIAN AND CHINESE ELEMENTARY MATHEMATICS TEACHERS

Babette **Moeller***

Education Development Center

MATH FOR ALL: ESTABLISHING THE EVIDENCE BASE FOR A PROFESSIONAL DEVELOPMENT PROGRAM

Naoki **Ohta*** (1), Seiji **Moriya** (2)

1: Fukuyama City University; 2: Tamagawa University

CREATION OF EDUCATIONAL CONTENT FOR DEVELOPING A LESSON STUDY

Jennie **Pennant***

GrowLearning

COACHING: WHAT DO PRIMARY TEACHERS PERCEIVE AS THE EFFECTIVE ELEMENTS OF A SPECIALIST-COACHING APPROACH IN MATHEMATICS?

Chloe **Weir***

University of Western Ontario

ELEMENTARY MATHEMATICS TEACHERS AND SELF-DIRECTED PROFESSIONAL DEVELOPMENT

Amber **Willis***

University of Michigan

SITUATING TEACHERS' OPPORTUNITIES TO LEARN IN PRACTICE-BASED PROFESSIONAL DEVELOPMENT

Stephanie **Schuler**, Gerald **Wittmann***

University of Education Freiburg

PRIMARY SCHOOL TEACHERS RUNNING IN-SERVICE TRAININGS FOR FELLOW TEACHERS – AN INVESTIGATION OF ACTIVITIES AND EXPECTATIONS

Time: Friday, 29 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer

TSG 50 – In-service education, and professional development of secondary mathematics teachers

Jehad **Alshwaikh***

University of the Witwatersrand

MDI AND CHANGING PRACTICE IN MATHEMATICS INSTRUCTION

Samuel **Benchmark*** (1), Linda **Mattsson** (2)

1: Chalmers University of Technology; 2: Blekinge Institute of Technology

WHAT MATHEMATICS TEACHERS MISS IN THEIR IN-SERVICE TRAINING

Nathan **Borchelt***

Western Carolina University

MATH TEACHERS' CIRCLES: BUILDING COMMUNITIES OF MATHEMATICAL PRACTICE

Dédé L. **de Haan***

Utrecht University

THE EFFECTIVENESS OF PROFESSIONAL DEVELOPMENT FOR MATH TEACHERS:
COMPARING TWO PROFESSIONAL DEVELOPMENT INTERVENTIONS

Paulo **Diniz*** (1), Jonei Cerqueira **Barbosa** (2)

1: Universidade Pedagógica de Moçambique; 2: Universidade Federal da Bahia

RECONTEXTUALIZING EDUCATIVE CURRICULUM MATERIALS BY MATHEMATICS TEACHERS IN
MOZAMBIQUE

Hanna **Gärtner***, Matthias **Ludwig**

Goethe-University of Frankfurt

EVALUATION OF AN INQUIRY, DISCOVERY AND PROJECT-BASED LEARNING PROGRAM

Lizeka **Gcasamba***

University of Witwatersrand

INVESTIGATING MATHEMATICS TEACHER LEARNING WHEN USING A RESEARCH-DESIGNED
RESOURCE IN A LESSONING STUDY

Jennie **Golding***

University College London Institute of Education

TEACHER OCCUPATIONAL CAPACITY: WHAT IT IS AND WHY IT MATTERS

Rita Santos **Guimaraes***

University of Nottingham

CHANGES IN PRACTICE: TEACHERS IN A DISCUSSION GROUP ABOUT LOW ACHIEVING
STUDENTS

Tobias **Jaschke***, Christine **Bescherer**

Pädagogische Hochschule Ludwigsburg

HOW TO INITIATE MATHEMATICAL UNDERSTANDING – DEVELOPPING A TEACHER
TRAINING ON THE CONSTRUCTION OF SUITABLE PROBLEMS

Steffen **Lünne***

DZLM

OUT-OF-FIELD TEACHERS' LESSON-PLANNING IN MATHEMATICS AFTER EDUCATION

Nontsikelelo **Luxomo***

University of the Witwatersrand

WHAT IS AN EXPLANATION AND ACTS OF EXPLAINING IN ALGEBRA?

Wairimu **Macharia***

CEMASTE

A POSTER ON PEDAGOGICAL SHIFT FROM PRE-ASEI CONDITION TO ASEI CONDITION

Behailu **Mammo*** (1), Jacqeline **Brooks** (2)

1: Hofstra University; 2: Stony Brook University

A WINDOW INTO NEW TEACHERS' MINDS

Narges Mortazi **Mehrabani***

Shahid Beheshti University

DEVELOPING A MODEL FOR MATHEMATICS TEACHERS' PROFESSIONAL LEARNING
FROM EACH OTHER





Yael **Nurick***

Weizmann Institute of Science

THE ROLE OF VIDEOTAPED MATHEMATICS LESSONS IN THE CRYSTALLIZATION
OF TEACHERS' MATHEMATICAL KNOWLEDGE FOR TEACHING

Arnulfo **Perez***, Anthony **Myers**, Azin **Sanjari**, Bailey **Braaten**

The Ohio State University

UNDERSTANDING ALGEBRA TEACHERS' COMPUTATIONAL THINKING

Adriana **Richit*** (1), Andriceli **Richit** (2), Mauri Luís **Tomkelski** (3)

1: UFFS – Universidade Federal da Fronteira Sul; 2: IFC – Instituto Federal Catarinense;

3: UFFS – Universidade Federal da Fronteira Sul

TEACHERS' PROFESSIONAL DEVELOPMENT FROM THE POINT OF VIEW LESSON STUDIES

Natalie **Ross*** (1), Gabriele **Kaiser** (1), Johannes **König** (2), Sigrid **Blömeke** (3), Nils **Buchholtz** (1),
Andreas **Busse** (1)

1: University of Hamburg; 2: University of Cologne; 3: CEMO of University of Oslo

TEDS-VALIDATION – VALIDATION OF INSTRUMENTS MEASURING PROFESSIONAL
COMPETENCE OF MATHEMATICS TEACHERS

Leonard **Sanchez***

Paris Diderot University

DIDACTIC ENGINEERING OF TEACHERS TRAINING IN DYNAMIC GEOMETRY

Victoria **Shure***

Freie Universität Berlin

SUBJECTIVE THEORIES OF IN-SERVICE MATHEMATICS TEACHERS TOWARDS GERMAN
AS A SECOND LANGUAGE IN MATH INSTRUCTION

Tom **Coenen**, Mark **Timmer***, Nelle **Verhoef**

University of Twente

DUTCH LESSON STUDY – EXAMPLES OF TEACHER LEARNING

Oliver **Wagener***, Larissa **Zwetzschler**

Universität Duisburg-Essen

"TYPES OF KNOWLEDGE" IN PROFESSIONAL-DEVELOPMENT COURSES ON TWO LEVELS:
TEACHERS & FACILITATORS

Juei Hsin **Wang***, Yen Ting **Chen**

National Chiayi University

A CASE STUDY OF MATH TEACHERS' TPACK PROFESSIONAL DEVELOPMENT
ON FLIPPED EDUCATION

Diana **White***

University of Colorado Denver

MATH TEACHERS' CIRCLES: SUMMARIZING FIVE YEARS OF RESEARCH RESULTS

Sun A **Yang***

KNUE

SECONDARY MATHEMATICS TEACHERS' PERCEPTION AND ADVANCED MATHEMATICAL
KNOWLEDGE FOR TEACHING OF ALGEBRA

Zhang **Yue***

Capital Normal University

A STUDY TO MATHEMATICS TEACHER TEAM OF JUNIOR SECONDARY SCHOOL

Wahid **Yunianto***, Subanar **Subanar**
 SEAMEO Regional Center for QITEP in Mathematics
 CONTINUOUS PROFESSIONAL DEVELOPMENT PROGRAM: MATHEMATICS TEACHING
 AND LEARNING MODELS

Maria Teresa **Zampieri*** (1), Sueli Liberatti **Javaroni** (2)
 1: UNESP; 2: UNESP
 CHANGES IN EDUCATIONAL PRACTICES OF MATH TEACHERS:
 APPROACHES WITH GEOGEBRA

Time: Friday, 29 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 52 – Empirical methods and methodologies

Tatiana Peres **Toledo***
 University of Ottawa
 “HIC ET NUNC” IN ENACTIVISM AND PHENOMENOLOGY: THE VALUE OF NOTICING

Robert **Ronau*** (1), Chris **Rakes** (2), Sarah **Bush** (3)
 1: University of Cincinnati; 2: University of Baltimore County; 3: Bellarmine University
 MATHEMATICS EDUCATION RESEARCH QUALITY RESULTS APPLIED TO PROFESSIONAL
 DEVELOPMENT EVALUATION AND RESEARCH FRAMEWORKS

Karsten **Schmidt***
 Hochschule Schmalkalden
 TEACHING MATHEMATICS AND STATISTICS IN THE PC LAB –
 WHAT DO THE STUDENTS THINK?

Marcos **Silva***
 Federal University of Maranhão – Brazil
 THE STATISTICAL AND STRATEGIC PLANNING AS AID INSTRUMENTS FOR
 IMPROVING MATHEMATICS TEACHING AND LEARNING

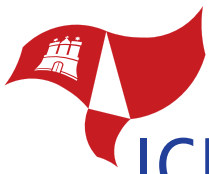
Alessandro **Spagnuolo***, Elena **Lazzari**
 University of Ferrara
 AN ANALYSIS OF PEER EDUCATION INTERVENTIONS IN MATHEMATICS EDUCATION

Dirk **Wessels***
 Stellenbosch University
 THERE IS NOTHING SO PRACTICAL AS A GOOD THEORY:
 DESIGN-RESEARCH IN MODELLING

Time: Tuesday, 26 July 2016, 18.00–19:00 / Location: I: blue, Philosophical Tower, foyer
TSG 53 – Philosophy of mathematics education

Taís Alves Moreira **Barbariz***
 UNESP
 GEOMETRY: OF WHAT IT TREATS?





Peter **Collignon***

University of Erfurt

TEACHING APPLIED MATHEMATICS AS A BRIDGE FROM PHILOSOPHY OF SCIENCE
TO PHILOSOPHY OF MATHEMATICS EDUCATION

Fayez Mourad **Mina***

Ain – Shams University

COMPLEXITY AND MATHEMATICS EDUCATION

Samuel **Otten** (1), Ryan **Nivens*** (2)

1: University of Missouri; 2: East Tennessee State University

COMPARING JOURNAL IMPACT MEASURES IN MATHEMATICS EDUCATION

Marli Regina **Santos*** (1), Rosemeire **de Fatima Batistela** (2)

1: Universidade Federal de Viçosa;

2: UEFS – Universidade Estadual de Feira de Santana e UNESP – Rio Claro

ASPECTS OF INSIGHTS ABOUT ANGLE GIVEN IN THE INTERSUBJECTIVES RELATIONS

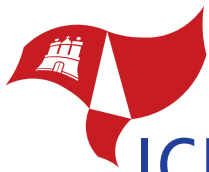
Anderson Afonso **Silva***, Maria Aparecida Viggiani **Bicudo**

Universidade Estadual Paulista – UNESP

THE PRODUCTION OF KNOWLEDGE IN MATHMATICS EDUCATION RESEARCH
GROUPS IN BRAZIL

P





Discussion Groups

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: I: blue, Philosophical Tower, lecture hall B

Organising team: Shuhua **An*** (California State University), Steklács **János**, Zhonghe **Wu**

**MATHEMATICS CLASSROOM TEACHING RESEARCH FOR ALL STUDENTS
DISCUSSION GROUP**

Abstract: The CTRAS Discussion Group demonstrates classroom teaching research for all students (CTRAS), through scientific research studies that also are applicable and make sense for classroom teachers. This Discussion Group will be structured by starting with a dialogue on the framework of classroom teaching research followed by discussions of each study by scholars and classroom teachers. The new research questions and action plans will be developed from the sessions of the CTRAS Discussion Group, and various working groups will be formed based on the different areas of focus in classroom teaching research.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: C: turquoise, Main Building, lecture hall M

Organising team: Mike **Askew*** (1,6), Ravi **Subramaniam*** (2), Anjum **Halai** (3), Erlina **Ronda** (4), Steve **Lerman** (5), Jill **Adler** (1), Hamsa **Venkat** (1)

(1: University of the Witwatersrand; 2: Homi Bhabha Centre for Science Education; 3: The Aga Khan University; 4: University of the Philippines; 5: London South Bank University; 6: Monash University)

MATHEMATICAL DISCOURSE IN INSTRUCTION IN LARGE CLASSES

Abstract: This DG is for participants interested in issues and challenges related to mathematics education in schooling systems where large classes (40+ students) are the norm. The fact that being in a large class is the reality for many students, particularly in developing nations, leads the organisers of this discussion group to consider the study of teaching large classes, at both primary and secondary levels, to be a worthy object of research and inquiry. In such it is primarily the teachers' instructional practices that provide the main point of access to mathematics for the learners. This DG team have been working with an analytical framework for studying mathematical discourse in instruction, MDI, which is characterised by four interacting components in the teaching of a mathematics lesson: exemplification, explanatory talk, learner participation and the object of learning (goal). Anticipated aims include identifying, sharing and discussing common key issues in teaching and learning in large classes and exploring the potential of the MDI framework to examine such issues. Thus we aim both to broaden the base of lessons that the framework might be applied to and to explore developing MDI.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Discussion Groups

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: G: green, Social Science Building, room 7

Organising team: Ban Heng **Choy*** (1), Dindyal **Jaguthsing*** (1), Mi Yeon **Lee*** (2), Edna **Schack*** (3)
(1: National Institute of Education, Nanyang Technological University; 2: Arizona State University;
3: Morehead State University)

MATHEMATICS TEACHER NOTICING: EXPANDING THE TERRAINS OF THIS HIDDEN SKILL OF TEACHING

Abstract: Research on what and how mathematics teachers notice in the classrooms has gathered momentum in the last decade, with an emphasis to develop noticing expertise in mathematics teachers. This DG aims to explore and expand the terrains of research on teacher noticing in 3 aspects: conceptualizations of noticing, methodologies for studying noticing, and the study of noticing in different contexts. Three sets of key questions will frame the discussions:

Question Set 1: What conceptualizations of noticing have been used? How do these inform our understanding of the processes of noticing? How are these conceptualizations related? Are there other new ways of conceptualizing noticing? Is it possible to assess teacher noticing expertise, and if so, how?
Question Set 2: What methodologies have been used for studying noticing? What other ways of studying noticing can we consider? How do we capture the different processes of noticing? How do we document the growth in a teacher's noticing expertise?

Question Set 3: What are the different contexts in which the study of noticing can be situated? How context specific is noticing? What is the relationship between teacher noticing and student learning?

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: I: blue, Philosophical Tower, lecture hall C

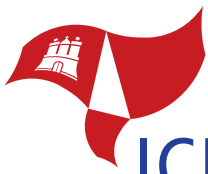
Organising team: Philip **Clarkson***
(Australian Catholic University)

CONNECTIONS BETWEEN VALUING AND VALUES: EXPLORING EXPERIENCES AND RETHINKING DATA GENERATING METHODS

Abstract: What do teacher colleagues learn when they read our research? What would teacher colleagues find if they looked at some of our research in a different way? Do our teacher friends wonder what it might be like to teach values that they are not sure of? Do our research colleagues wonder whether role play could be a set of new methods we could use in the future that might help in this area? One possibility for teachers we think is using role-playing as a way of building new experiences and for researchers as a potentially different type of data-generating context. Hence in this Discussion Group we explore values and valuing, and then perform and evaluate a role-play to this end. At the core of this context is experiencing what it is like to act out a given valuing role, or observing players who do so, and ascertaining whether identifiable behaviours are more likely to be associated with specific values. We will explore the experiences of the different 'players' and wonder whether such an approach will be useful for both teachers and researchers in coming to understand more deeply what it feels like to experience valuing a given value, and deciphering what behaviours point to particular values.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.





Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: D: yellow, West Wing Building, room 221

Organising team: Pat **Drake*** (1), Jeanne **Carroll*** (1), Barbara **Black*** (1), Linda **Phillips*** (2), Celia **Hoyles*** (3)

(1: Victoria University; 2: Independent Consultant; 3: London Knowledge Lab, University College London)
DEVELOPING NEW MATHEMATICS TEACHER LEARNING IN SCHOOLS AND THE STEM AGENDA

Abstract: The juxtaposition of school centred teacher preparation with shortages of well-qualified mathematics and science teachers at primary and secondary level in our countries raises big questions. The main purpose of this Discussion Group is to draw together international perspectives in exploring what can be learned about successful teaching and learning of mathematics-related fields by teachers, beginner teachers and teachers seemingly teaching 'out of field'; and to consider challenges for practice. The intention is to find ways of supporting the preparation of teachers in schools where reality is that expertise may be thin on the ground. We draw upon stimulus material from tertiary education and from informal learning, and this experience comes from practice, from policy, from research and from scholarship.

Outcomes include a sense of direction in the reality of preparing new mathematics teachers through school-centred approaches; international networks that sustain and lead to collaborative intervention projects; ways for mathematics teacher educators to position their work alongside policy and practice in schools.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: H: orange, Educational Building, lecture hall

Organising team: Joan **Ferrini-Mundy*** (1), Thierry **Zomahoun*** (2), Marcelo **Borba*** (3), Manfred **Prenzel*** (4), Fumi **Ginshima*** (5)

(1: National Science Foundation; 2: African Institute for Mathematical Sciences (AIMS); 3: State University of São Paulo (UNSEP); 4: Technische Universität München (TUM) School of Education; 5: National Institute for Educational Policy Research)

NATIONAL & INTERNATIONAL INVESTMENT STRATEGIES FOR MATHEMATICS EDUCATION

Abstract: Mathematics education is an essential pathway for economic security and technological advancement at the national, community, and individual levels. There is world-wide impetus for innovation and improvement of mathematics curriculum and pedagogical practices that meet local and practical needs. Input from practitioners is essential for policy makers and research funding organizations to navigate the path forward. The 13th International Congress on Mathematics Education is an excellent venue to engage educators with national and regional policymakers. This discussion group will explore the following global issue:

What is the appropriate role of funding agencies, ministries, and related institutions in influencing and advancing improvements in mathematics education research and policy, as well as in facilitating international research in mathematics learning?

Questions will include: How should organizations set priorities for mathematics education research and policy that connect to local and practical needs? How can scientific communities contribute to processes of strategic planning and agenda setting in funding agencies? What kind of international collaborations might be useful?

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Discussion Groups

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: G: green, Social Science Building, room 8

Organising team: Gregory **Foley*** (1), Sergio **Celis*** (2), Hala M. **Alshawa*** (3), S. Nihan **Er*** (4), Heba Bakr **Khoshaim*** (5), Jane D. **Tanner*** (6)

(1: Ohio University; 2: Universidad de Chile; 3: University of Jordan; 4: Alanya Alaaddin Keykubat University; 5: Prince Sultan University; 6: Onondaga Community College)

TRANSITION FROM SECONDARY TO TERTIARY EDUCATION

Abstract: The modern world thrives on quantitative information. Consequently, many university majors are becoming increasingly mathematical. Thus it is problematic that many secondary school graduates are not ready for tertiary course work in mathematics and statistics. For example, 35.1% of U.S. college mathematics enrollments are in pre-college remedial courses: 1.4 million out of 3.9 million in fall 2010 (Blair, Kirkman, & Maxwell, 2012). Such deficiency in mathematical knowledge and skills can influence students' decisions to abandon their intended major and transfer to a less mathematically demanding major, or even to quit tertiary education. This discussion group will examine the difficulties that students encounter in making the mathematical transition from secondary to tertiary education. The group will investigate the methods used to assess student readiness in mathematics and programs to help beginning tertiary students when they face mathematical struggles. The discussion will consider both students who seek mathematically intensive majors at the tertiary level and those who pursue less mathematically intensive degrees.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: G: green, Social Science Building, room 29

Organising team: Ian **Galloway*** (1,2), Barbel **Baerzel** (3), Andreas **Eichler** (4)

(1: Copernican Revolutions; 2: Institute of Physics, UK; 3: University Duisburg-Essen; 4: University Kassel)

TEACHERS TEACHING WITH TECHNOLOGY

Abstract: The two sessions of the T3-discussion group cover the main aspects of the work of T3 Europe, particularly in Germany. Each session will be organized along two subtopics beginning with a brief input (max. 10 min) about a concrete example – followed by a statement from the discussant to open a plenary discussion afterwards.

Details of the discussion group and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: C: turquoise, Main Building, lecture hall A

Organising team: Solomon **Garfunkel*** (COMAP)

INTERNATIONAL MATHEMATICAL MODELING CHALLENGE (IMMC)

Abstract: Through student presentations and a panel discussion with members of the Organizing Committee we will present the new International Mathematical Modeling Challenge, a high school modeling competition with world-wide representation. Only in its second year the challenge has representatives of 30 countries. We welcome your participation.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.





Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: K: purple, Law Building, lecture hall

Organising team: Roland H. **Grabner*** (1), Andreas **Obersteiner*** (2), Bert **De Smedt** (3), Stephan **Vogel** (1) (1: Institute of Psychology; 2: Institute of Mathematics Education, University of Education; 3: Faculty of Psychology and Educational Sciences)

MATHEMATICS EDUCATION AND NEUROSCIENCE

Abstract: The research field of educational neuroscience – linking neuroscience, psychology, and education – has witnessed a tremendous growth in the past 5–10 years. By combining behavioral and neuroscientific methods, its general aim is to achieve a broader understanding of the neurocognitive mechanisms underlying learning and to support the development of effective instruction. A considerable impetus for the growth of educational neuroscience came from research on mathematics learning. Some of these findings have been presented in special issues in the journal ZDM Mathematics Education, in 2010 and 2016. Despite the field's success, it has been repeatedly questioned whether the obtained neuroscientific evidence has implications for education or whether the connection between neuroscience and education is a bridge too far. Has the inclusion of the neuroscientific level of analysis furthered our understanding of mathematics learning and how to support it? The aim of this discussion group is to bring together neuroscientists, psychologists, and math educators, and to discuss the chances and limitations of educational neuroscience research on selected topics of mathematics education.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: I: blue, Philosophical Tower, lecture hall A

Organising team: Koeno **Gravemeijer*** (1), Fou-Lai **Lin*** (2), Cyril **Julie*** (3), Minoru **Ohtani*** (4), Michelle **Stephan*** (5)

(1: Eindhoven University of Technology; 2: National Taiwan Normal University & Shi-Da Institute for Mathematics Education; 3: University of the Western Cape; 4: Kanazawa University & Kanazawa University Senior High School; 5: University of North Carolina a)

WHAT MATHEMATICS EDUCATION WILL PREPARE STUDENTS FOR THE SOCIETY OF THE FUTURE?

Abstract: In this Discussion Group we want to gather congress participants interested in exchanging and discussing potential answers to the question, "What are the implications of the computerization and globalization of our society for mathematics education?" The role of mathematics in our society is growing, but more importantly, mathematics is increasingly done by machines. This will have an impact on both future job requirements and on the mathematics one will need to understand their world. So the question arises, "How can mathematics education prepare students for being able to participate in the digital society?" Key Questions are:

Which of the 21st century skills can, and should, be fostered in mathematics education? And, how could this be done?

What skills and insights are necessary for mathematical modeling in out-of-school reality? And, what are the implications for mathematics education?

What mathematical topics will have to be designated as goals of mathematics education?

How will a shift in goals from routine skills to understanding affect the learning trajectories and the overall structure of the curriculum? And, how can computer tools help reaching those goals?

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Discussion Groups

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 2098/2194

Organising team: Niels **Grønbæk*** (1), Henrik **Bang*** (2), Claus **Larsen*** (2)

(1: University of Copenhagen; 2: Christianshavns Gymnasium)

CHALLENGES IN TEACHING PRAXIS WHEN CAS IS USED IN UPPER SECONDARY MATHEMATICS

Abstract: Being unequivocally mathematical and having transformative impact on mathematics itself characterize CAS. This prompts a new dialectic relationship between tool and discipline to be instigated. We address this from the angle of teaching, i.e. CAS focus on mathematic didactics within the frame that CAS is an augmentation of mathematics, and from the angle of professionalization, i.e. teachers operating within the transformed conditions. CAS has been an important means to meet the systemic call for targeting the teaching of mathematics at giving a large number of students authentic skills, while still being an instrument for sorting students to different higher educational levels. Which challenges do teachers face within the educational system? Teachers are often caught in a choice between sound use of CAS in mathematical thinking and merely letting CAS serve as a tool to surpass cumbersome problem solving. How can we support teachers to be robust operators? What standards should a communal language of a didactical discourse possess, and what experience is there to support teachers in obtaining these skills and aid them in developing their own teaching in order to meet these demands?

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 2101/2105

Organising team: Dietmar **Guderian***

MATHEMATICS IN CONTEMPORARY ART AND DESIGN AS A TOOL FOR MATH-EDUCATION IN SCHOOL

Abstract: Aim No. I – (Tuesday) :Mathematics in contemporary art with special view on roots in countries of origin of refugees actually entering Europe. The idea is to give indigenous children (and adults) as well as immigrated children (and adults) by the way an idea of the cultural level in their formerly homelands and some proudness, too.

Aims No. II – (Friday) First:Contemporary art and design often is real applied mathematics and it is more interesting to scholars than traditional math teaching.

Secondary: The velocity of the internet allows artists to pick up new results nearly simultaneously to the specialists and introduce them into their artworks.

Examples, Lectures, Handouts: Participants of DG are asked to search for examples (aim I or aims II).

If possible send them in advance to guderian@ph-freiburg.de to find out together, which examples might be effective for a short lecture during the sessions. Resting examples may be introduced by handouts to the DG, too. There are three exhibitions in Hamburg galleries (Kammers, Multiple-Box, Preussners) specially curated for the DG. During ICMI every day information on their events via: www.dietmarguderian.de

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.





Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: H: orange, Educational Building, room 105

Organising team: Gülseren K. **Akar*** (1), Ali **Delice*** (2), Nicola **Hodkowski*** (3), Tim **Rowland*** (4), Emin **Aydın*** (5), Stefan **Zehetmeier*** (6), Esra **Bukova-Guzel*** (7), Bulent **Guven*** (8), Pat **Thompson*** (9) (1: Bo azici University; 2: Marmara University; 3: University of Colorado Denver; 4: University of Cambridge; 5: Marmara University; 6: University of Klagenfurt; 7: Dokuz Eylül University; 8: Karadeniz Teknik University; 9: Arizona State University)

A FRAMEWORK FOR MATHEMATICS TEACHER EDUCATION: LINKING TEACHER PERSPECTIVES TO MATHEMATICS TEACHING COURSES

Abstract: The focus of the Discussion Group will be two-fold: first day, the discussion will be centered on introducing and discussing mathematics teacher's perspectives. For that, we plan to discuss and define each of the perspectives on teaching. Then, we plan to discuss knowledge quartet framework and how perspectives framework differ from other notions in the field such as beliefs, dispositions, etc. Finally, we plan to discuss how perspectives framework may assist mathematics teacher educators and how it could be studied with the account of practice methodology. The second day, the discussion will focus on fostering teachers? Advances along the perspective continuum. For that, we plan to discuss how quantitative reasoning framework might contribute to math teacher education and what research has been done in turkey to foster progress toward the progressive incorporation perspective (pip): in particular, we plan to discuss the I) quantitative reasoning II) tasks focusing on logico-mathematical and empirical learning processes, III) conceptual analysis, and IV) clinical interviewing as a possible four-column base framework for the development of pip in the methods and practice teaching courses.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: C: turquoise, Main Building, lecture hall B

Organising team: Johannes **Koenig*** (1), Sigrid **Blömeke*** (2), Gabriele **Kaiser*** (3) (1: University of Cologne; 2: CEMO; 3: University of Hamburg)

THEORETICAL FRAMEWORKS AND WAYS OF ASSESSMENT OF TEACHERS' PROFESSIONAL COMPETENCIES

Abstract: The Discussion Group brings together major projects on mathematics teachers' professional competencies and thus forwards the exchange of research teams' approaches and new findings brought about by their current research activities. The discussion group, covering two sessions of 90 minutes each, shall be a mix of discussions on general and topical questions related to theoretical frameworks and ways of assessment of teachers' professional competencies. Both sessions are moderated jointly by the organisers. In all discussions, the audience is invited to participate. In the first session, after an introduction by the organisers, the first three projects are characterised by the strong focus on teachers' knowledge facets. After the fourth project, which makes the transition to an enriched framework on teachers' competencies including performance-oriented competence facets being evaluated via video, the discussant Hilda Borko will comment in a summarising way on the four projects. The second session will be devoted to projects with a focus on situated competence facets, which are evaluated via video-based assessment instruments.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Discussion Groups

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: I: blue, Philosophical Tower, lecture hall E

Organising team: Sebastian **Kuntze*** (1), Orly **Buchbinder** (2), Anika **Dreher** (3), Marita **Friesen** (1)
(1: Ludwigsburg University of Education; 2: University of New Hampshire; 3: IPN Kiel)

USING REPRESENTATIONS OF PRACTICE FOR TEACHER EDUCATION AND RESEARCH – OPPORTUNITIES AND CHALLENGES

Abstract: Representations of classroom practice offer the chance of referring to the teachers' professional environment both when conceiving opportunities of professional development and when investigating aspects of teacher expertise. Representations of practice can stimulate teachers' criteria-based analysis in environments that do not bring the full pressure and action constraints of the actual classroom. This discussion group aims at collecting experiences with different forms of use of representations of practice in pre-service and in-service teacher professional development activities and research into aspects of teacher expertise and its development. On this base, the discussion group plans to include an overview of different approaches to representing practice, address key issues of case-based learning, as well as methodological issues and questions related to validity of the construct(s) researchers or facilitators aim to address.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 05

Organising team: Carlos Eduardo Leon **Salinas***, Jefer Camilo Sachica **Castillo***
(Universidad La Gran Colombia)

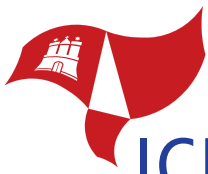
MATHEMATICS ROLE AT SCHOOL IN POST-CONFLICT ENVIRONMENT.

Abstract: The Colombia armed conflict is presented as well as state policies that have been configured to think the school's structure during post-conflict. Similar experiences of countries that have already gone through or are in post-conflict situation, by contributions and accounts of participants in the discussion are evaluated to see how the armed conflict in a country reassesses the curriculum of mathematics, especially when mathematics becomes a factor of desertion and discouragement at all school levels. The main features which should concentrate education policies after the resolution of the conflict arises, considering that education is seen as a stage that helps to legitimize new inclusion practices and enhance opportunities for dialogue and knowledge building. Finally the construction of minutes compiling all contributions by those attending the discussion group is performed through analysis named above, leading by three generating questions. Finally, the creation of a network to allow continuous study on issues related to the reevaluation of the school mathematics curriculum in a post-conflict environment and how work is set speech math teacher must adapt to these new demands.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG





Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: C: turquoise, Main Building, lecture hall C

Organising team: Yew Hoong **Leong***
(National Institute of Education)

VIDEOS IN TEACHER PROFESSIONAL DEVELOPMENT

Abstract: Over the last decade or so, the leap in video-related technology (that afforded ease of capturing, storing, editing, and transmitting of video data) has prompted a re-visit to the promise of video in teacher education. They allow teachers not only to learn through modeling and feedback, but technologically they better enable inquiry-based approaches. There is, however, as yet a lack of discussion at the theory level in the literature on a number of critical issues in this field. Without clear theoretical orientations, efforts to implement – even successfully – video usage in teacher PD remain as isolated cases without a broader framework to guide replicable and future work in this area. Thus, the aim of this Discussion Group (DG) is to propose and discuss models of video-based PD programmes that are strongly grounded theoretically.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: G: green, Social Science Building, lecture hall

Organising team: Juliane **Leuders*** (1), Timo **Leuders*** (1), Kathleen **Philipp*** (2), Vicki **Steinle*** (3)
(1: University of Education Freiburg; 2: Zurich University of Education; 3: University of Melbourne)

DIAGNOSTIC COMPETENCES OF MATHEMATICS TEACHERS

Abstract: Teachers' diagnostic activities consist of gathering and interpreting data, be it by formal testing, by observation, by evaluating students' writings or by interviewing students. In teaching, the goal of diagnosis is to yield valid knowledge on the achievement of individual students or of the whole class. The teachers' knowledge, skills and beliefs connected to these diagnostic activities can be summarized as diagnostic competences. Only very few efforts try to elucidate the cognitive processes activated. Nickerson (1999) presents a general model based on a huge body of research on people's understanding of the knowledge of others and on processes of imputing other people's knowledge. The discussion group focuses on mathematics teachers (pre-service / in-service) and their competences and practice in diagnostic situations. The topics addressed during the sessions elaborate on theoretical foundations, significant findings, different empirical approaches and on analysis or support of teachers' practice.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: I: blue, Philosophical Tower, lecture hall G

Organising team: Kate **Mackrell*** (1), Maike **Schindler*** (2), Arthur **Bakker*** (3), Dave **Pratt*** (1)
(1: University College London; 2: Örebro University; 3: Freudenthal Institute)

APPLYING CONTEMPORARY PHILOSOPHY IN MATHEMATICS AND STATISTICS EDUCATION: THE PERSPECTIVE OF INFERENCE

Abstract: The aim of this discussion group is to put contemporary philosophy to work (cf. Cobb, 2007). Inferentialism is an example of contemporary philosophy (Brandom, 2000) that increasingly receives interest in mathematics and statistics education. It can be considered an orienting framework that provides ontological and epistemological foundations for conceptualizing and analyzing knowledge, learning, communication, and reasoning in the fields of mathematics and statistics. Inferentialism avoids a representationalist perspective on knowledge and learning by focusing on reasoning and inferences (Bakker & Derry, 2011). The Discussion

Discussion Groups

Group addresses researchers who are interested in the role and use of inferentialism or other contemporary philosophies in mathematics and statistics education. It gives the attendants the opportunity to share perspectives, to question, to discuss, and to make joint efforts in answering the posed key issues. The DG format at ICME provides the opportunity to discuss the significance and the restrictions of the perspective of inferentialism and other contemporary philosophies on the

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 2095/2197

Organising team: James **Maltas***
(University of Northern Iowa)

USING A GRAPH THEORY PROBLEM TO PROMOTE PROBLEM SOLVING IN PROFESSIONAL DEVELOPMENT OF SECONDARY TEACHERS

Abstract: The session involves the presentation of a graph theory problem used in professional development settings promoting problem solving. A graph theory problem was chosen as this topic is not a standard topic for secondary classes. Most secondary teachers have had limited exposure to the topic and therefore will be solving a new problem. Participants will be given time to work the problem and discuss their solutions. This discussion will be followed by a discussion of ways to improve the professional development experience and possible other problems that could be used in this environment.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 3136/3142

Organising team: Pauline Anne Therese **Mangulabnan*** (1), Toh Tin **Lam*** (2), Padmanabhan **Seshaiyer*** (3), Soledad **Ulep*** (4)

(1: University of Fukui; 2: National Institute of Education; 3: George Mason University;
4: National Institute of Science and Mathematics Education – University of the Philippines)

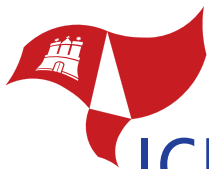
**FRAMING A MATHEMATICS TEACHER FOR THE 21ST CENTURY CLASSROOM:
WHAT? HOW? WHY?**

Abstract: Students are changing faster than classroom adaptation. The 21st century classroom challenges teachers that routine, rule-based knowledge, which is easiest to test, is also easiest to digitize automate and outsource; thus expecting math teachers to bring in creativity, problem solving and critical thinking in the classroom (Schleider, 2012). But what is this really to a teacher? Do math teachers really understand 21st century classroom and learning? Quality learning comes from quality teaching; and investing in teacher's professional capital yields good results (Hargreaves&Fullan, 2012). Thus, how can we develop teacher's professional capital? This workshop will share teacher professional development practices in JP, Phil, SG and USA, and provide participants a venue to learn about, raise questions and reflect on their own teacher education/professional development practices. The workshop's key ideas are (1) discussing the content, pedagogical and cultural expectations and its gap with current classroom practices, and (2) the possibility of constructing a universal framework for math teacher education preparation/professional development practices for the 21st century math classroom.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG





Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: G: green, Social Science Building, room 28

Organising team: Dragana **Martinovic*** (1), Viktor **Freiman*** (2)

(1: University of Windsor; 2: Moncton University)

HOW DOES MATHEMATICS EDUCATION EVOLVE IN THE DIGITAL ERA? DISCUSSING A VISION FOR MATHEMATICS EDUCATION

Abstract: With this discussion group we hope to create synergies and produce ideas on how to improve mathematics education. The general questions may be: Is how we are teaching mathematics in school good enough? Is the kind of mathematics students are learning in schools the right kind? What is the mathematical literacy for the 21st century? How are mathematical and digital literacies connected? Specific topics cover different areas that participants proposed as crucial aspects of mathematical literacy, for example: Financial literacy is needed in life, but what does it entail? What topics are not now being emphasized and what topics now taught will become obsolete? How are the new technologies changing WHAT and HOW we teach and learn? Do they make obsolete the need for traditional manipulative skills? Do they create new opportunities for deeper understanding and problem-solving skills? Is the ability to problem solve necessary when we have devices that help us do things and that connect us with others who know better (or who may have answers)? Are mathematics educators ready to be challenged by the large-scale computing, big data, stochastic modelling, and crowd sourcing?

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: D: yellow, West Wing Building, room 121

Organising team: Lynne **McClure***, Rachael **Horsman**, Ellen **Jameson**

(University of Cambridge)

EXPLORING THE DEVELOPMENT OF A MATHEMATICS CURRICULUM FRAMEWORK: CAMBRIDGE MATHEMATICS

Abstract: Cambridge Mathematics is developing an innovative framework for presenting and organising the domain of mathematics that we hope will be able to lend valuable and coherent support to curriculum development efforts in jurisdictions across the world. After much consultation, investigation and research we are developing a map of the full domain of mathematical knowledge from pre-school to the end of upper secondary starting with the experiences pupils should have in mathematics. The work is being influenced by the work of Lynn Arthur Steen and principles of experiential learning and the circular curriculum. Content is being assessed for its appropriateness in a modern society, with considerations for technology integration. All decisions are being carefully based in academic research and practical experiences of teachers. We are now considering ways of representing the domain, tagging and linking various routes and deciding what information such a structure should contain for different audiences. We will share and discuss the Framework project, with a focus on the first draft and current explorations, so that our work can benefit from the range of international expertise present.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Discussion Groups

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: C: turquoise, Main Building, lecture hall J

Organising team: Raimundo **Olfos*** (1), Ivan **Vysotkiy*** (2), Manuel **Santos-Trigo*** (3), Masami **Isoda*** (4), Anita **Rampal*** (5)

(1: Pontificia Universidad Catolica de Valparaiso; 2: Moscow Center for Continuous Mathematical Education; 3: Centro de Investigación y de Estudios Avanzados, Cinvestav-IPN; 4: Centre for research on International Cooperation in Education U. Tsukuba; 5: Un)

SCOPE OF STANDARDIZED TESTS

Abstract: The aim of the Discussion Group is to capture the sense of the community, not only from experts about standardized testing. Reflection should provide implications to global policies. A regular view is "Standardized tests are needed because they can provide an amount of information and evidence of validity. Of course there can be incorrect interpretations, but these can be reduced if the quality of the test has the attributes that are associated with standardized assessments" A critical approach is to highlight "Limited Scope of standardized tests in school maths, because these tests undermine abilities to conjecture and to encourage open problems in class. Standardized testing devalues abilities to collaborate and to engage in real-world experience; failing to the mission of the pursuit of happiness and justice of all. Ethic issues are unsolved: policymakers do not know how to use test-based incentives. Some school systems are under great pressure to raise their scores. Tests create competition between schools. Standardized testing does not take into account diversity, test anxiety, language of students, and special needs. So they fail to the aims of math education"

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: E: mint, Economical Building, room 0079

Organising team: Susan **Orme*** (1), Danae **Romrell*** (2), Elaine **Wagner*** (3)

(1: Brigham Young University-Idaho; 2: Brigham Young University-Idaho; 3: Brigham Young University-Idaho)

ENGAGING STUDENTS IN ACTIVITIES THAT LEAD TO DEEP STUDENT LEARNING AT THE SECONDARY AND TERTIARY LEVEL

Abstract: "When students connect mathematical ideas, their understanding is deeper and more lasting, and they come to view mathematics as a coherent whole" (NCTM, n.d.). We propose this deeper learning can occur through teaching methods that use carefully designed activities, questions, and assessments.

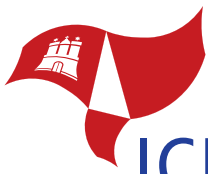
Well-designed activities occur when students engage with content before, during, and after class.

We begin by discussing activities and questions students can engage in to begin developing an understanding of the concepts prior to coming to class. Then, we discuss activities and teaching methods that build on preparatory activities and can be used in class to lead to a richer understanding of mathematical concepts. Finally, we discuss assignments, activities, and assessments that occur after class to help students solidify and demonstrate their understanding.

As noted by the NCTM (n.d.), "students require frequent opportunities to formulate, grapple with, and solve complex problems that involve a significant amount of effort". The purpose of this discussion group, will be for participants to share activities that have worked well for promoting deeper understanding.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.





Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: G: green, Social Science Building, room 30

Organising team: Marisa **Quaresma*** (1), Carl **Winsløw*** (2)

(1: Universidade de Lisboa; 2: University of Copenhagen)

LESSON/LEARNING STUDIES (LS) AND MATH EDUCATION

Abstract: Lesson Study (Shimizu, 2014) and Learning Study (Runesson, 2014) (LS) have a growing importance in teacher education, mostly in continuous professional development, but also in prospective teachers' education. LS are conducted in a variety of subjects, often with a non-subject specific point of view. Nevertheless, many LS are conducted in mathematics and are a specific subject of study for many researchers in mathematics education. This interest is paralleled by a demand of more solid theorization of the lesson study process (for eg. Clivaz, 2015; Hart, Alston, & Murata, 2011a; Miyakawa & Winsløw, 2009; Winsløw, 2011). Many social, cultural, cognitive and affective issues have reflexes in the way LS develop and on their results (Ponte et al., 2014). This DG will provide participants with an occasion to discuss the specificities of mathematics LS with regards to regional/national particularities, as well as the methodological and theoretical tools which may be used to carry out research on LS (it's forms, contents, effects etc.) from an international perspective.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: I: blue, Philosophical Tower, lecture hall F

Organising team: Ali **Rejali*** (1), Peter **Taylor*** (2), Yahya **Tabesh*** (3), Abolfazl **Rafiepour*** (4),

Jérôme **Germoni*** (5)

(1: Isfahan University of Technology; 2: University of Canberra; 3: Sharif University of Technology;

4: Shahid Bahonar University; 5: Lyon House for Mathematics and Informatics)

MATHEMATICS HOUSES AND THEIR IMPACT ON MATHEMATICS EDUCATION

Abstract: Since 1999, teams of the Iranian high school teachers and university faculties have established what are called Mathematics Houses in Iran. "Math House" is a community center that aims to provide a learning environment and opportunities for the students and teachers at all levels for experiencing deeper understanding of mathematical concepts and developing creativity through working on real-life problems by team work and cooperation [1]. House of Mathematics has also been established in other places such as Masion desMathématiques et de l'Informatique de Lyon (France), La Maison des Maths in Quaregnon (Belgium), Mathematicum in Giessen (Germany), the Arhimedes Premises in Belgrade (Serbia), and possibly in some other places as well, which can be introduced.

Introducing Mathematics Houses and similar institutions throughout the world to the audience and discussing their effect on mathematics education and their important impact on promoting team working and popularizing mathematics, as well as looking for some new ways of cooperation and exchange of experiences are the main aims of this Discussion Group.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Time: 2016-Jul-29 16:30

Location: D: yellow, West Wing Building, room 220

Organising team: Miguel **Ribeiro*** (1), Arne **Jakobsen*** (2), Alessandro **Ribeiro*** (3), Nick H. **Wasserman*** (4), José **Carrillo*** (5), Miguel **Montes*** (5), Ami **Mamolo*** (6)

(1: State University of Campinas – UNICAMP ; 2: University of Stavanger;

3: Federal University of ABC – UFABC; 4: Teachers College, Columbia University;

5: University of Huelva; 6: University of Ontario Institute of Technology)

REFLECTING UPON DIFFERENT PERSPECTIVES ON SPECIALIZED ADVANCED MATHEMATICAL KNOWLEDGE FOR TEACHING

Abstract: Teachers' knowledge assumes a major role in practice and in the students learning and achievement. In particular, the construct of horizon knowledge or, what can be termed specialized advanced mathematical knowledge for teaching (in order to capture the overall perspectives we are dealing with within this proposal) has been the focus of attention from some researchers with different foci of attack (e.g., Carrillo, Climent, Contreras, & Muñoz-Catalán, 2013; Jakobsen, Thames, Ribeiro, & Delaney, 2012; Wasserman & Stockton, 2013; Zazkis & Mamolo, 2011). In that sense, and aiming to deepen our understanding of such a construct, the aim of this working group is to discuss and reflect upon, different theoretical perspectives, methodological approaches and analytic methods used when focusing on such specialized advanced mathematical knowledge for teaching. In particular, we consider the activities of analysing and conceptualizing situations where access and development of such teachers' knowledge is of primary importance.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, lecture hall B

Organising team: Bettina **Roesken-Winter***, Eilerts **Katja**

(Humboldt-Universität zu Berlin)

EVIDENCE-BASED CPD: THE GERMAN CENTER OF MATHEMATICS TEACHER EDUCATION (DZLM)

Abstract: Conceptualizing and developing CPD in an evidence-based way, meaning that strengths of differ approaches to CPD are evidenced by empirical findings whether by means of quantitative qualitative research methods, is challenging (Rösken-Winter, Hoyles & Blömeke, 2015). Even m demanding is spreading evidence-based CPD by scaling initiatives and innovations which t maintain themselves for an extended time period. In this regard, aligning research and policy as as possible is crucial and demands CPD approaches on a systemic level (Hoyles & Mundi 201 Following the examples of other countries, in Germany a center was established to implement s an approach. The DZLM (Deutsches Zentrum für Lehrerbildung Mathematik—German Centre Mathematics Teacher Education) intends to provide high-quality CPD for mathematics teach while settling principles and quality criteria to define CPD standards. The center gives particu emphasis to the research-based development of CPD courses while following a Design-Ba Research approach. Aim and rationale of the discussion group are to focus on the development CPD, thus to attend to conditions and requirements, on the one hand, and to outline how resea perspectives can be pursued that contribute to our knowledge about effects and sustainability.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.





Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: C: turquoise, Main Building, lecture hall H

Organising team: Sabrina **Alessandro**, Petronilla **Bonissoni**, Marina **Cazzola**, Paolo **Longoni**, Gianstefano **Riva**, Ernesto **Rottoli***
(Università Milano Bicocca)

AN ACT OF MATHEMATIZATION FOR THE FAMILIARIZATION WITH FRACTIONAL NUMBERS

Abstract: In spite of the efforts over half a century both in research and in practice, the results of teaching fractional numbers are not satisfactory and difficulties are widespread and persistent. We have started an unusual project concerning the introduction of the fractional numbers, in the third degree of primary school. The key points of our proposal are: (1) a process of familiarization with fractional numbers; (2) fractional numbers as a new universe; (3) the foundation is an act of elementary and fundamental mathematization which identifies the action of comparing homogeneous quantities with a pair of natural numbers; it differs both from an excessively formalized approach and from modelling; (4) the measure of a quantity is defined as the comparison between the quantity and the "whole"; the term "unit" is reserved to indicate the "common unit"; (5) "dialogue among the activities" is the act of playing the different manipulative, depending on the properties you want to present.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: G: green, Social Science Building, room 27

Organising team: James **Roznowski*** (1), Huei **Low-Ee** (2), Younes **Fardinpour** (3), Vilma **Mesa** (4)
(1: Delta College; 2: Duke-NUS Graduate Medical School, Centre for Ageing, Research and Education;
3: I.A. University of Iran; 4: University of Michigan)

CURRENT PROBLEMS AND CHALLENGES IN NON-UNIVERSITY TERTIARY MATHEMATICS EDUCATION (NTME)

Abstract: This discussion group will focus on issues related to mathematics education in non-university tertiary institutions (NTME). Institutions in this category confer academic degrees, but have undergraduate education as their primary focus. Institutions may be academically or vocationally focused, granting terminal degrees and certifications or preparing students to transfer to university.

Anticipated aims of a discussion group during ICME-13 include: identifying, sharing, and discussing solutions to common key issues, challenges, and opportunities pertaining to all areas of mathematics education in NTMEs throughout the world.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: E: mint, Economical Building, lecture hall A

Organising team: Alexei L. **Semenov***, Sergey **Polikarpov***
(Moscow State University of Education)

MATH FOR 21ST CENTURY SCHOOL. THE RUSSIAN EXPERIENCE AND INTERNATIONAL PROSPECTS

Abstract: The origins of Russian mathematical education can be traced back to renowned Leonhard Euler. During the last hundred years much has happened to make mathematics and math education in Russia a remarkable part of national culture. We should mention: Russian mathematicians A. Kolmogorov, I. Gelfand and others, actively and deeply participated in mathematical education, including this for secondary school, Russian system of mathematical Olympiads, System of high-schools for students gifted in math,

Kvant (Russian: for “quantum”) magazine in mathematics and physics for school students and teachers. In mid 1980-s Russian mathematical education was extended with the area of “informatica”, including fundamentals of mathematical logic and theory of algorithms. ICT tools for mathematical activities are used nowadays in pre-school and primary school. Dynamic geometry is used to promote experimental and open-ended learning. An inauguration decree (2012) of President Putin started development of the Conceptual Framework for Development of Mathematical Education in Russia. We propose to share Russian experience and ideas for further development to be used for the world math education community.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: D: yellow, West Wing Building, room 120

Organising team: Sepideh **Stewart*** (1), Avi **Berman** (2), Christine **Andrews-Larson** (3), Michelle **Zandieh** (4)

(1: University of Oklahoma Norman Campus; 2: Technion – Israel Institute of Technology; 3: Florida State University; 4: Arizona State University)

[TEACHING LINEAR ALGEBRA](#)

Abstract: Research on students’ conceptual difficulties with linear algebra first made an appearance in the 90’s and early 2000’s (e.g. Carlson, 1997; Dorier & Sierpiska, 2001). Over the past decade, research on linear algebra has concentrated on the nature of these difficulties and students’ thought processes (e.g. Stewart & Thomas, 2009; Wawro, Zandieh, Sweeney, Larson, & Rasmussen, 2011). The aim of the discussion group is to initiate a multinational research project on how to foster conceptual understanding of Linear Algebra concepts.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 3034

Organising team: Hannes **Stoppel*** (1), Bronislaw **Czarnocha** (2)

(1: Wilhelm University Münster; 2: City University of New York)

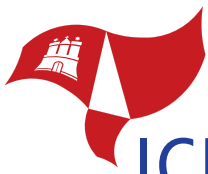
[CREATIVITY, AHA!MOMENTS AND TEACHING-RESEARCH](#)

Abstract: The Discussion Group is proposed to investigate the nature of creativity of Aha!Moments in mathematics through the coordination between the bisociation theory proposed by Koestler (1964) in his Act of Creation and recently published accounts of Aha!Moments in literature of mathematics education. Koestler definition of creativity uncovers creativity’s cognitive aspect in the creation of new schema of thinking by connecting previously unconnected frames of reference; his realization connects the cognitive and affective aspects through the principle of cognitive/affective duality of the Aha!Moment (Czarnocha, 2014). That act of liberation has the power to significantly increase motivation of students, and consequently, their levels of achievement. Presence of an affective dimension of the Aha!Moment has been empirically observed and discussed by Liljedahl (2013). (Palatnik, & Koichu, 2015) realize that the aha-experience might be found over a consideration of what might students attend to, and how, and why.

The work of the Discussion Group will provide an example of the process of coordinating teaching practice and a theory. Results of the DG will be presented by PP on PME 40 in Szeged.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.





Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: E: mint, Economical Building, room 2067/71

Organising team: Steve **Thornton*** (1), Virginia **Kinnear** (2), David **Moltow** (3)

(1: Australian Academy of Science; 2: Flinders University of South Australia; 3: University of Tasmania)

TRUTHFULNESS, OPEN-MINDEDNESS AND EVIDENCE: SEEKING THE INTELLECTUAL VIRTUES IN SCHOOL MATHEMATICS

Abstract: The intellectual virtues have been described by Sockett (2012) as including aspects such as truthfulness, open-mindedness and evidence. Building on the ideas of Aristotle and MacIntyre (2007), who called for a rediscovery of Aristotelian ethics in contemporary society, Sockett claims that these virtues are the mark of an educated human being and should form a central goal of education. However, neither Sockett nor others with an interest in education and philosophy have specifically identified how such virtues can be developed through the core disciplines such as mathematics. In this Discussion Group we propose to:

- a) Introduce and discuss key concepts of virtue ethics, specifically the intellectual virtues;
- b) Examine how the intellectual virtues might inform mathematics education, specifically mathematics curriculum;
- c) Examine how mathematics education might contribute to broader goals of education, specifically the fostering of intellectual virtues; and
- d) Commence an ongoing discussion of intellectual virtues in mathematics education, leading to the presentation and publication of papers in mathematics education and educational philosophy conferences and journals.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30–18.00

Location: I: blue, Philosophical Tower, lecture hall D

Organising team: Alphonse **Uworwabayeho***

(University of Rwanda-College of Education)

SHARING EXPERIENCES ABOUT THE CAPACITY AND NETWORK PROJECTS INITIATED BY ICMI

Abstract: The Capacity and Network Project (CANP) is a development project of the International Commission of Mathematical Instruction (ICMI) supported by the International Mathematical Union (IMU), UNESCO and the International Council of Scientific Unions (ICSU) as well as regional governments and institutions. The project is a response to Current Challenges in Basic Mathematics Education (UNESCO, 2011), which includes a call not just for mathematics education for all but for a mathematics education of quality for all. Five CANPs have been organised so far. The purpose of the Discussion Group at ICME 13 consists in sharing experience about challenges and opportunities in preparing for a CANP event. Discussions will be guided by the following key questions: what are key issues that impact mathematics learning and achievement in developing contexts (e.g. poverty, gender, linguistics, regional marginalization)? What are the similarities and differences from the different CANP regions/events? What significant role networks can play in building synergies across disciplines and geographies with regard to this issue?

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

Discussion Groups

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: B: dark-brown, East Wing Building, room 221

Organising team: Luz **Valoyes-Chavez*** (1), Danny Bernard **Martin*** (2), Joi **Spencer*** (3), Paola **Valero*** (4)

(1: Universidad Santiago de Cali; 2: University of Illinois at Chicago.; 3: University of San Diego; 4: Stockholm University)

WHITE SUPREMACY, ANTI-BLACK RACISM, AND MATHEMATICS EDUCATION: LOCAL AND GLOBAL PERSPECTIVES

Abstract: The ubiquity and persistence of racism, in all its forms on a global scale, stems from the fact that the meanings for race and racial categories are created, politically contested, and recreated in any given sociohistorical and geopolitical context as a way to maintain boundaries of difference related to domination and oppression (Omi & Winant, 1994). Mathematics Education, as an institutional field of practices is not exempt from racism and issues of power. It is a racialized domain, an instantiation of white institutional space controlled primarily by White and male researchers. Mathematics education is also a political project that serves larger racial projects (Martin, 2013). Yet, critical reviews of the extant research literature suggest that the realities of White supremacy, anti-Black racism, and xenophobia are not globally reflected as considerations in mathematics education research. Thus, the discussion group is aimed at facilitating discussions to explore the current state of research directed to uncover the mechanisms and practices responsible for the reproduction and maintenance of racial domination within mathematics education.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.

DG

Time: Tuesday, 26 July 2016 and Friday, 29 July 2016, 16.30 – 18.00

Location: C: turquoise, Main Building, lecture hall K

Organising team: Claire **Wladis***
(City University of New York)

RESEARCH ON NON-UNIVERSITY TERTIARY MATHEMATICS

Abstract: The focus of this group will be mathematics education research within the non-university tertiary context, with a particular focus on questions related to what happens inside mathematics classrooms in these institutions. Students enrolled in these institutions are more likely to belong to groups that have traditionally been both underrepresented in mathematics (and in higher education more generally) and that are at higher risk of college dropout: they are often the first in their families to attend college, they tend to be older, have work and family responsibilities, and on average have weaker pre-college preparation.

Details of the discussion group and the timetable can be found in the programme on the website and in Conftool.





Workshops

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 205

Organising team: Maxima **Acelajado***, Edna T. **Mercado**, Rhea R. **Mateo**, Carmela Z. **Reyes***, Anita N. **Parungao**

(De La Salle University – Dasmariñas)

FLIPPED TEACHING APPROACH: COGNITIVE AND NONCOGNITIVE GAINS

Abstract: This workshop will provide background information about the flipped teaching approach (FTA) and its merits and present some research findings about studies on the FTA using various ICTs in different mathematics subjects at De La Salle University-Manila/Dasmariñas, Philippines. This workshop will serve as a venue for discussion about the FTA and a springboard for more research activities in related areas.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 2163/2168

Organising team: Debbie **Barker*** (1), Craig **Pournara*** (2)

(1: Mathematics in Education and Industry; 2: University of the Witwatersrand)

DESIGNING MATHEMATICS TASKS FOR THE PROFESSIONAL DEVELOPMENT OF TEACHERS WHO TEACH MATHEMATICS STUDENTS AGED 11–16 YEARS

Abstract: This workshop focuses on identifying and developing tasks that are appropriate to use in professional development with mathematics teachers of 11–16 year olds who self-identify as being “non-specialists” in mathematics. The professional development of this group of teachers tends to get overlooked because of the focus on senior secondary mathematics and primary mathematics. Many non-specialist teachers of mathematics lack confidence in their knowledge of mathematics and yet they play a pivotal role in the mathematical education of students. There is much still to be learned about what constitutes appropriate professional development for them – from both a mathematical perspective and in terms of pedagogy.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 208

Organising team: David E. **Barnes*** (1), Trena **Wilkerson*** (2), Michelle **Stephan** (3)

(1: National Council of Teachers of Mathematics; 2: Baylor University;

3: University of North Carolina – Charlotte)

CONTRIBUTING TO THE DEVELOPMENT OF GRAND CHALLENGES IN MATHS EDUCATION

Abstract: Other fields have identified a list of Grand Challenges to prioritize the most pressing problems that research should address. The NCTM Research Committee wrote and published in JRME (<http://bit.ly/1Yd4q2V>) a commentary that argues for initiating this approach for mathematics education. If the field of mathematics education were to come together and identify a list of Grand Challenges for Maths Education, what might the list include? Could and should we initiate a process to generate that list? What are the associated benefits and risks?

While significant differences exist in our local and national challenges, there are also likely to be

significant overlap. The endeavor of ICME is founded on the desire to “promote the collaboration, exchange and dissemination of ideas and information on all aspects of the theory and practice of contemporary mathematical education.” (ICMI Homepage.) The voluntary participation in and adoption of a common set of Grand Challenges in Maths Education work to support the international collaboration toward common challenges. We invite an open discussion, dialogue, and potential future collaboration on the topic of Grand Challenges in Maths Education.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 06

Organising team: Kerry **Cue***
(Mathspig Blog)

HOW MANY M&MS WILL KILL A 14YO? REVERSING THE DECLINE IN STEM STUDIES BY MAKING MIDDLE-SCHOOL MATHS REAL, RELEVANT + FUN

Abstract: Over the last 20 years participation in STEM studies in senior school and at tertiary level has steadily dropped in many western countries. The maths experience of middle school students is important as it impacts on the number of students that flow on to higher-level STEM studies.

This paper looks at reasons why middle-school students ‘hate maths’ and the entertaining workshop program is designed to show participants how maths – serious maths, funny maths, crazy maths – can be found anywhere in the culture and utilised in the middle school maths classroom to make maths real, relevant and fun for all students.

Kerry Cue aka Mathspig is an Australian humourist, journalist, author and humorous maths blogger. Her popular Mathspig blog has over 1,000,000 hits.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: K: purple, Law Building, room 18/19

Organising team: Guillermo **Curbera*** (1), Bernard **Hodgson*** (2), Birgit **Seeliger*** (3)

(1: Universidad de Sevilla, International Mathematical Union; 2: Université Laval; 3: International Mathematical Union)

“OLDIES BUT GOODIES”: PROVIDING BACKGROUND TO ICMI MISSION AND ACTIVITIES FROM AN ARCHIVAL PERSPECTIVE

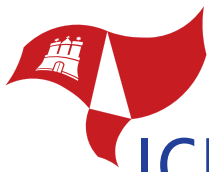
Abstract: The aim of this workshop is to draw attention to the importance and usefulness of archiving among the mathematics and mathematics education communities, presenting some of today’s modern technical tools and focusing on the case of the ICMI Archive—a subset of the Archive of the International Mathematical Union. This Archive contains a wealth of documents helping to understand how a scientific community operates at the international level. We intend to illustrate the usefulness of archiving in order to keep an accurate image of the activity of mathematicians and mathematics educators.

Questions to be examined include: By whom and for whom archiving? Why archiving? What archiving? Discussion of the accessibility and long-term preservation of documents will include the issue of archiving emails. We will present the Media Archive, a new way of archiving images: the community archives its own history through this open media platform. We will present an overview of the ICMI Archive content. We will survey examples of recent research with a historical flavour using information found in the Archive. A selection of “gold nuggets” discovered among the Archive documents will be presented.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

WS





Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 0077

Organising team: Bernd **Ferner***
(Portland State University)

TEACHING MATHEMATICS WITH STUDENTS FROM CULTURALLY AND LINGUISTICALLY DIVERSE BACKGROUNDS

Abstract: Focusing on upper elementary and midlevel mathematics, this interactive workshop is geared towards an audience of practitioners who want to experience methods useful to engage culturally and linguistically diverse students in meaningful learning. This workshop employs a mix of research presentation, activities, and conversations on teaching in today's classrooms. Gay's (2010) framework of culturally responsive teaching will be used to discuss how to create equal learning opportunities for all learners. From an understanding that diversity is an asset to our classrooms, participants will be introduced to strategies to foster cultural and language learning activities which are useful in enhancing math lessons. This bilingual workshop will be partly in German and partly in English to emphasize the challenges language learners may experience. Practitioners will be given guidance and strategies for implementing culturally responsive teaching in classrooms. The strategies may be especially relevant for teachers of mathematics in Germany given the current increase of culturally diverse students.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: B: dark-brown, East Wing Building, room 123

Organising team: Karl Josef **Fuchs*** (1), Christian **Kraler*** (2), Simon **Plangg*** (1)
(1: Universität Salzburg / SoE & FB Mathematik, Austria; 2: Universität Innsbruck)

THE SHIFT OF CONTENTS IN PROTOTYPICAL TASKS USED IN EDUCATION REFORMS AND THEIR INFLUENCE ON TEACHER TRAINING PROGRAMS

Abstract: National education reforms have been mainly undertaken by prototypical tasks. Hence the underlying idea of this workshop is to induce sensibility for the cognition of this important parameter. The practical debate on prototypical tasks will methodologically take center of the workshop framed by presentations about the state of knowledge concerning this influence parameter in the beginning and a summary of the essential outcomes in the end.

In detail the following aims characterise the dynamics of the proposed workshop:

Aim #1: Identifying the new importance of prototypical examples in the context of ongoing educational reforms.

Aim #2: Identifying challenges in the use of prototypical examples within the context of curricula in Mathematics at secondary level.

Aim #3: Identifying possible washback-effects of prototypical examples on teacher education curricula at universities.

Aim #4: Giving answers to the question if the strategy of providing prototypical examples may be interpreted as a Fundamental Idea in Mathematics Education in the sense of experiencing and opening the world.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: B: dark-brown, East Wing Building, room 121

Organising team: Damjan **Kobal***
(University of Ljubljana)

THE POWER OF GEOMETRY IN THE CONCEPT OF PROOF

Abstract: Using in our schools too often neglected geometry, engaging teaching can be achieved almost without words in contemplative pantomime settings. The aim of the workshop is to show the power of geometry in the development of the concept of proof. Several relatively easy geometric ideas will be presented through simple mind provocative questions and by the use of technology. The aim of these questions is not solely to motivate the answer, but is much deeper and educationally wider. Namely, the aim is to motivate the understanding and the beauty of the resolved uncertainty brought by the certainty of a proof. In a way, a proof should be as much an emotional experience as a rational achievement. Participants will be challenged with several mind provoking questions, followed by individual engagements in the form of short problem solving sessions and concluded by joint discussions. By the use of geometry, we aim to show, that to learn and appreciate mathematics, one needs to understand the concept of proof. And in order to understand the concept of proof, one needs to experience the challenge of uncertainty that precedes the certainty of a proof.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 4098

Organising team: JungHang **Lee***
(Nyack College)

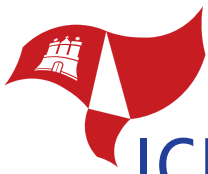
SHOUT FROM THE MOST SILENT NATION, NORTH KOREA: CAN MATHEMATICS EDUCATION BE POLITICALLY NEUTRAL?

Abstract: This workshop addresses mathematics education in one of the most closed countries in the world — North Korea, as an extreme example of political influences on mathematics education. North Korean secondary school mathematics education is examined through the review of North Korea's social and educational structures as well as its political and ideological position. In-depth interviews were conducted with defectors, who are now in South Korea, former secondary school mathematics teachers and students, to understand their real life experiences in school mathematics in North Korea. Workers' Party's influence on mathematics education and the impact the March of Suffering are examined. There are two main focuses of this workshop. One is to introduce an extreme case study of mathematics education in North Korea influenced by political and ideological standpoint. This will broaden the participants' understanding of mathematics education as not only a self-regulating subject, but also as an interwoven matter shaping and shaped by the vessel and the people in it. This will also propose a chance to reassess the participant's own mathematics education system with possibly enhanced span.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

WS





Time: Tuesday, 26 July 2016, 16.30–18.00

Location: B: dark-brown, East Wing Building, room 120

Organising team: Sarva Brenda **Letchumee***
(PRO INTELLECT / CGL Primary School)

SCEDUS MATH A LEARNING PLATFORM WHERE MATH BECOMES CREATIVE,
INTERACTIVE AND EXCITING

Abstract: Practice! Practice! Practice! That's how most students learn addition or division. However, children are more receptive to learning when the learning is associated with play than with work. SCEDUS MATH, a revolutionary learning method, is designed to instil students strong foundational skills that can help them excel in the competitive marketplace both in Malaysia and internationally. SCEDUS MATH is more than learning Math. It provides a unique learning platform that will help students acquire and apply crucial life skills such as Creativity, Critical Thinking, Communication and Collaboration. SCEDUS MATH uses multidisciplinary card games to facilitate a systematic way of learning Mathematics. The Math cards carry real life problems that would require students to use Mathematics skills to solve them as a team. The team-based problem solving technique will encourage sharing, turn-taking and social skills. Answers to assigned problems will unfold in a creative fashion as they complete various tasks associated with the problems. SCEDUS MATH makes learning Mathematics easy and creates fun and excitement for both students and teachers.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30–18.00

Location: E: mint, Economical Building, room 0029

Organising team: Wai Leng **Lye*** (1), Karen **Low*** (2)
(1: National Junior College; 2: Methodist Girls' School)

HARNESSING TECHNOLOGY AS A TOOL FOR COLLABORATIVE LEARNING AND ASSESSMENT

Abstract: In this workshop, the presenters will share their experiences on the use of educational technology to deliver the lesson unit package and assessments comprising the collaborative learning principles.

Participants will have a hands-on experience at collaborative learning and assessment design through the use of ICT.

Participants are required to bring their own laptops for this workshop.

At the end of the workshop, participants will be able to:

- (1) Appreciate the use of the flipped classroom model to increase student-student interactions.
- (2) Learn strategies to develop students' collaborative learning capabilities through engaging themselves in the use of ICT.
- (3) Design appropriate assessments, based on Bloom's Taxonomy, to deepen students' mastery and developing 21st century competencies.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30–18.00

Location: H: orange, Educational Building, room 212

Organising team: Sabine **Meinck***, Oliver **Neuschmidt**, Milena **Taneva**
(IEA DPC)

USE OF EDUCATIONAL LARGE-SCALE ASSESSMENT DATA FOR RESEARCH ON
MATHEMATICS DIDACTICS

Abstract: As a leading entity in the field of education for nearly 60 years, IEA promotes capacity building and knowledge sharing to facilitate innovation and foster quality in education. All data arising from IEA studies provide a tremendously valuable and rich source for secondary analysis in many fields of educational research, including the didactics of mathematics. The primary objective of this workshop is to show that and how IEA study data can be used for the purpose of improving teaching mathematics. We will (i) introduce the structure of IEA data, (ii) show access paths to data sources, technical documentation, analysis guides and software tools, and (iii) explain the possible uses of data for researchers who focus on the didactic of mathematics. All this will be done at the hand of the two studies TIMSS and TEDS-M including practical examples.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 3016

Organising team: Maria **Mitchell*** (Central Connecticut State University)

[LEARNING FORWARD](#)

Abstract: The goal of this workshop is to inform educators ready to teach middle and high school mathematics topics that aligns with the Common Core State Standards for Mathematics, specifically the Mathematical Practices integrated with the Content Standards.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: D: yellow, West Wing Building, room 222

Organising team: B. David **Redman. Jr.***

(Delta College)

[SYMMETRY, CHIRALITY, AND PRACTICAL ORIGAMI NANOTUBE CONSTRUCTION TECHNIQUES](#)

Abstract: The workshop will illustrate several educational and entertaining applications of origami in the classroom. The activities illustrate symmetry, chirality, and duality in simple modular origami as well as the flexibility of Pentagon-Hexagon Zig-Zag (PHiZZ) units in constructing more sophisticated models. Additional illustrations of counting and graph coloring will be provided.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 206

Organising team: José L. **Rodríguez*** (1), David **Crespo** (2), Dolores **Jiménez** (3)

(1: University of Almería; 2: IES Alborán; 3: CEIP San Fernando)

[SIERPINSKI CARPET PROJECT](#)

Abstract: The Sierpinski Carpet Project is a nonprofit, collective and joint activity among children, from 3 to 16 (extended to 99 years old), around the world. The result is a giant geometric fractal, known as Sierpinski Carpet, with colored squared stickers. The project, which started on May 2014, culminates on May 2016, involving more than 40.000 children of 400 schools of 38 countries.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

WS





Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 211

Organising team: Susanne **Schnell*** (1), Mona-Lisa **Maisano** (1), Julia **Ollesch*** (2)

(1: University of Cologne; 2: Pädagogische Hochschule Heidelberg)

TIME MANAGEMENT AND WORK ORGANIZATION

Abstract: Doing a PhD, most students have to deal with many different tasks at the same time such as teaching, researching, reading, taking part in lectures/trainings/team meetings, etc. To cope with all the different requirements and expectations, strategies for self-management and self-motivation can help you get by. In this workshop, we will address the following questions: How can you efficiently organize your to-do list? What are strategies for setting priorities? How can you set yourself aims and stick to them? After a short interactive presentation, we will invite you to share your experiences and strategies with the other participants.

The workshop is supposed to introduce some methods and background knowledge of self-management to young researchers, such as the 'Eisenhower method' for setting priorities, the 'pareto principle' or 'getting things done' by David Allen. The workshop has been conducted during the German Nachwuchstag for 3 years in a row and has been given very positive feedback from the participating PhD students.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: B: dark-brown, East Wing Building, room 122

Organising team: Shimon **Schocken*** (1), Raz **Kupferman** (2)

(1: IDC Herzliya; 2: Hebrew University)

GUIDED SELF-DISCOVERY OF ELEMENTARY SCHOOL MATHEMATICS: THE MATIFIC PROJECT

Abstract: According to Jean Piaget, "whenever we teach children something, we deny from them the ability to discover it on their own". This workshop explores how carefully designed software and "gamification" can help children learn mathematics, from kindergarten to 6th grade, in a constructive and structured process of self-discovery.

The workshop will focus on the following issues:

The pedagogical virtue and cognitive impact of self-discovery.

How to create games and activities that promote self-discovery.

Streamlining the self-discovery process: staging, hinting, rewarding.

The teacher's role in self-discovery.

During the workshop we'll discuss several examples of mathematics education games, taken from the Matific project (www.matific.com), designed by the workshop organizers and others. Each game uses gamification and constructive learning techniques to promote self-discovery.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

WS

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 207

Organising team: Lineu **da Costa Araujo Neto**, Rubens Carlos **Viriato Júnior***, Jéssica **de Aguiar França***
(University of Brasilia)

THE LIGHT GAME: AN ACTIVITY OF LINEAR SYSTEMS

Abstract: This booklet contains four activities in which it is proposed that students imagine two lamps (for the first activity) or three lamps (for the third and fourth activities), each one containing one switch. Concepts of congruence modulo 2 and congruence modulo 3 are developed on these activities.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Tuesday, 26 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 2091/2201

Organising team: David **Wees***, Sara **Toguchi***, Liz **Ramirez***
(New Visions for Public Schools)

REHEARSING INSTRUCTIONAL ACTIVITIES TO SUPPORT ONGOING PROFESSIONAL DEVELOPMENT OF MATHEMATICS TEACHERS

Abstract: The challenge of formative assessment is less often generating evidence of student learning and more often deciding what to do based on that evidence. Over the last several years, particularly through the transition to the Common Core State Standards, US mathematics teachers have paid careful attention to useful and less useful tools for collecting evidence of learning. Successful professional development will support teachers in making effective use of that evidence. Instructional Activities allow teachers to focus on pedagogical decisions by relying on routinized thinking structures to sustain meaningful classroom interactions. While the rehearsal of these instructional activities has been explored in training pre-service teachers, this workshop will offer a model for deploying the rehearsal of ambitious instructional activities in a sustained professional development program.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30 – 18.00

Location: K: purple, Law Building, room 1+2

Organising team: Sorin **Alexe*** (1), Consuela **Voica** (2), Cristian **Voica*** (3)
(1: XColony Project; 2: Herastrau Middle School; 3: University of Bucharest)

A KNOWLEDGE DISCOVERY PLATFORM FOR SPATIAL EDUCATION: APPLICATIONS TO SPATIAL DECOMPOSITION AND PACKING

Abstract: The workshop aims to introduce the XColony Knowledge Discovery Kit – a new teaching platform based on geometric manipulatives and designed in the STEM education context for training creativity and spatial intelligence in primary and middle school students. After a brief introduction of the basic concepts, participants are invited to evaluate the platform from students' perspective by actively participating in hands-on mini projects, with the goal of constructing 3D structures that allow them to discover new geometric properties. A relevant case study on how the platform can be utilized in class is presented and the participants discuss and identify other mathematical concepts and educational activities conducted in a similar manner. The workshop concludes with a test that participants can voluntarily take, or they can take it home and use it as a self-evaluation tool for spatial intelligence.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

WS





Time: Friday, 29 July 2016, 16.30–18.00

Location: H: orange, Educational Building, room 212

Organising team: Alf **Coles***, Aurelie **Chesnais**, Julie **Horoks**
(University of Bristol)

THE ROLE OF THE FACILITATOR IN USING VIDEO FOR THE PROFESSIONAL LEARNING OF TEACHERS OF MATHEMATICS

Abstract: We will work on: (1) how can and do facilitators guide work with mathematics teachers on video?; (2) what are the principles that guide our choices in our use of the video?; (3) what are the implications, for mathematics teacher learning, of these different choices made by facilitators? The organisers will work actively with participants to demonstrate two ways of working (using the same video clip). We aim to share the detail of practice and how wider principles are enacted when using video. The first way of working we offer is based on principles derived from Jaworski (1990) and Coles (2013, 2014). The second way of working is based on principles derived from Horoks and Robert (2007), Chesné et al. (2009), Chappet-Pariès and Robert (2011), Robert and Vivier (2013). We are interested in learning from experiencing each others' practice and hope that discussion grounded in the common experiences at the start of the workshop will be rich in connections. We will focus on similarities and differences in how work with video can be orchestrated (including the role of the mathematics) and work on how research could be taken forward into the role of the facilitator of the use of video.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30–18.00

Location: H: orange, Educational Building, room 207

Organising team: Ester **Dalvit***

(Istituto Nazionale di Alta Matematica, University of Toronto, University of Camerino)

USING BRAIDS TO INTRODUCE GROUPS: FROM AN INFORMAL TO A FORMAL APPROACH

Abstract: The workshop proposes a hands-on activity, particularly suitable for high school teachers, who can then propose the workshop in a classroom. Goals are to introduce or review some basic group theory and gain ideas to communicate topics in an engaging way.

Braids are rich topological objects that can be easily turned into algebraic objects. The key concepts of the workshop are:

1. The formalization of braids as algebraic objects;
2. The operation of composition and the structure of group;
3. A comparison between the composition of braids and numerical operations;
4. Non-commutativity of the composition;
5. Distinguishing braids using invariants: the permutation associated with a braid.

These concepts will be discovered and examined by the participants through a concrete guided activity in small groups.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30–18.00

Location: G: green, Social Science Building, room B528

Organising team: Jan **DeLange***

(Freudenthal Institute)

DESIGN FOR CURIOUS MINDS: SERIOUS PLAY

Abstract: Children between the age of three and six are not only curious but also know more than we often think. What is remarkable and somewhat disturbing is that many of these interests seem to

disappear as soon as children enter school. Learning language skills and arithmetic 'replace' interesting skills like problem solving, reasoning, argumentation, creative thinking and much more. Can we keep the curiosity in the child? Can we further facilitate the development of these very valuable process skills? We have identified many play-activities with a solid scientific content that led to new insights how young children reason and think.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 2091/2201

Organising team: Jessica M. **Deshler*** (1), Jessica **Ellis*** (2)

(1: West Virginia University; 2: Colorado State University)

[INTERNATIONAL SIMILARITIES/DIFFERENCES IN EXPERIENCES/PREPARATION OF POST-GRADUATE STUDENTS AS TERTIARY INSTRUCTORS](#)

Abstract: This workshop will bring together researchers from across the globe to discuss the teaching preparation of post-graduate mathematics students tasked with teaching tertiary mathematics. In the United States, post-graduate mathematics students are referred to as Graduate Teaching Assistants (GTAs) and examination of their teaching-related professional development is on the rise. However, we know very little about the similarities and differences in the ways post-graduate mathematics students are involved in tertiary mathematics teaching and prepared for this teaching across the globe. A main goal of the workshop is to initiate a conversation resulting in an international overview of post-graduate mathematics student teaching preparation. We have recruited scholars who work in this area to bring to the workshop their expertise from institutional, regional or national perspectives to discuss similarities and differences with respect to two specific issues: (1) the ways that post-graduate mathematics students are involved in tertiary level mathematics teaching and (2) the ways they are prepared for this involvement in tertiary teaching of mathematics.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 0029

Organising team: Hugo Alex **Diniz***

(Universidade Federal do Oeste do Pará)

[USING LISP AS A TOOL FOR MATHEMATICAL EXPERIMENTATION](#)

Abstract: In this workshop, we propose to present the high-level programming language LISP as a tool for mathematical simulation and experimentation in a secondary mathematical educational environment. The computer algebra system Maxima was implemented using LISP language. We will introduce the fundamentals of the language and use it to study the "Impossible Problem", as named by Martin Gardner in 1979. The purpose is to show some possibilities of how students can use this tool to investigate mathematical problems. It's recommended to have a notebook or mobile device, with a Common LISP implementation, in order to better accomplish the activities. Technical details and study materials are available at www.lapmat.com.br/oficinas/problemaimpossivel.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

WS





Time: Friday, 29 July 2016, 16.30–18.00

Location: B: dark-brown, East Wing Building, room 121

Organising team: Axelle Person **Faughn***, Nathan **Borchelt***
(Western Carolina University)

MATHEMATICS TEACHERS' CIRCLES AS A PROFESSIONAL DEVELOPMENT MODEL CONNECTING TEACHERS AND UNIVERSITIES

Abstract: Mathematics Teachers' Circles (MTC) are professional development communities of mathematics teachers and professors who meet regularly to work on rich mathematics problems. Each MTC includes approximately 15 to 20 teachers. Most are middle school teachers, but many groups also include some high school or elementary school teachers. Groups also include several mathematics department faculty from a college or university, or other professional mathematicians from academia or industry. Ongoing research has begun to demonstrate the benefits of MTCs for teachers' confidence, knowledge, and teaching of mathematics. Mathematics professors gain an opportunity to share their enjoyment of mathematics with teachers, contribute to teacher education and enrichment, and become more involved in the local education community. During this workshop we propose to introduce participants to Mathematics Teachers' Circles professional development models, engage them in MTC-type mathematics, share some results of MTC interventions, and open the discussion to further ideas and/or questions on implementing MTC in various cultural contexts. **Details of the workshop and the timetable can be found in the programme at the website and in Conftool.**

Time: Friday, 29 July 2016, 16.30–18.00

Location: H: orange, Educational Building, room 206

Organising team: Juan D. **Godino*** (1), Teresa **Neto*** (2), Miguel R. **Wilhelmi** (3)
(1: Universidad de Granada; 2: Universidad de Aveiro; 3: Universidad Pública de Navarra)

ANALYSIS OF ALGEBRAIC REASONING AND ITS DIFFERENT LEVELS IN PRIMARY AND SECONDARY EDUCATION

Abstract: An important objective in various curricular guidelines (e. g., NCTM, 2000) is the enhancement of algebraic reasoning since the first educational levels. This objective implies that we assume a new view of school algebra as being not limited to handling algebraic expressions (Aké, Godino, Gonzato & Wilhelmi, 2013; Godino, Ake, Gonzato & Wilhelmi, 2014). The effective implementation of this new conception of school algebra poses a challenge for the training of mathematics teachers, because few current training programs include the development of such new vision. The objective of the workshop is to implement some practical activities aimed at recognizing the main features of School Algebraic Reasoning (SAR), which can be used to train teachers to promote algebraic thinking in primary and secondary education. The wider view of school algebra that will be presented and discussed takes into account the processes of generalization, symbolization, as well as structural and functional modelling and analytical calculation. It also creates a meaningful link between algebraic thinking in primary and secondary education. **Details of the workshop and the timetable can be found in the programme at the website and in Conftool.**

WS

Time: Friday, 29 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 06

Organising team: Lenni **Haapasalo*** (1), Harry **Silverberg*** (2), Bernd **Zimmermann*** (3)
(1: University of Eastern Finland; 2: University of Turku; 3: Friedrich Schiller University of Jena)

DESIGNING AND EVALUATING MATHEMATICAL LEARNING BY A FRAMEWORK OF ACTIVITIES FROM HISTORY OF MATHEMATICS

Abstract: Working on a framework from history of mathematics (octagon of eight activities) for designing and evaluating of math. learning environments (Haapasalo/Zimmermann 2015).

Questions:

Relation of these activities to other ideas/activities (Bruner 1977, Bishop 1988)? Colleagues, who are interested, should have read the corresponding parts of these books. Please, name + e-mail-address until 7/15 to lenni.haapasalo@uef.fi + pertti1@gmx.de

Octagon useful as a framework for designing and evaluating?

Structure:

- Presentations by the organizers.
- Group-work on:

Improvement of the instrument?

Testing and use of the improved instruments?

Result-presentation.

References:

Bishop, A. J. (1988). Mathematical Enculturation. Dordrecht: Kluwer.

Bruner, J. S. (1977). The Process of Education. Cambridge, Mass.: Harvard University Press.

Haapasalo, L., & Zimmermann, B. 2015. Investigating Mathematical Beliefs by Using a Framework from the History of Mathematics. In: Bernack-Schüler, C., Erens, R., Leuders, T., Eichler, A. (Eds.): Views and Beliefs in Mathematics Education. Wiesbaden: Springer Spektrum.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

WS

Time: Friday, 29 July 2016, 16.30 – 18.00

Location: H: orange, Educational Building, room 205

Organising team: Caroline **Hilton*** (1), Markus **Cslovjecsek*** (2)

(1: UCL Institute of Education; 2: University of Applied Sciences and Arts Northwestern Switzerland)

SOUNDING MATHEMATICS: HOW INTEGRATING MATHEMATICS AND MUSIC INSPIRES CREATIVITY AND INCLUSION IN MATHEMATICS EDUCATION

Abstract: We will introduce the principles underpinning our integrated approach to the teaching of mathematics and music, within the context of "low threshold, high ceiling" tasks. Participants will have the chance to engage with a number of activities which explore patterns and relationships in mathematics and music, and issues with communication which are common to both curriculum subjects. These will provide the opportunity for participants to experience how each of these curriculum subjects can be learned together and truly integrated in order to support learning and deeper understanding within and across both domains. In our project we have been collaborating with teachers from different disciplinary backgrounds. Experience in CPD Courses and in classrooms has shown that in the same learning situation, learning can go in different directions for different learners. When we are prepared for different and diverse thinking paths the unexpected is what makes teaching motivating and exciting. It is almost unbelievable what children can teach us when we take the risk of presenting them with questions and problems we do not have the answer to before we start.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.





Time: Friday, 29 July 2016, 16.30–18.00

Location: D: yellow, West Wing Building, room 222

Organising team: Natanael **Karjanto*** (1), Husty Serviana **Husain** (2)

(1: Sungkyunkwan University; 2: Indonesian Education University)

ADOPTING MAXIMA AS AN OPEN-SOURCE COMPUTER ALGEBRA SYSTEM INTO MATHEMATICS TEACHING AND LEARNING

Abstract: In this workshop, a computer algebra system (CAS) Maxima will be introduced. The primary audience of this workshop is mathematics educators, particularly school teachers and university professors who have experience in teaching Calculus and Linear Algebra with a CAS and those who would like to introduce a possible alternative CAS into their classrooms. Maxima is a computer software can be used for the manipulation of symbolic and numerical expressions, including limit calculation, differentiation, integration, Taylor series, systems of linear equations, polynomials, matrices and tensors. It can also sketch some graphical objects with excellent quality. Some examples from Calculus will be presented and how Maxima plays a role in enhancing students' understanding will also be discussed.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30–18.00

Location: H: orange, Educational Building, room 208

Organising team: Bjarnheiður **Kristinsdóttir***

(Hamrahlíð College)

SILENT SCREENCAST VIDEOS AND THEIR USE WHEN TEACHING MATHEMATICS

Abstract: The aim of this workshop is to introduce teachers and mathematics education researchers to the concept of silent screencast videos. This will be done by showing the results of a Nordic/Baltic research project, allowing the participants to work on their own commentaries to silent videos, and guiding them in the process of developing new silent videos.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30–18.00

Location: E: mint, Economical Building, room 4098

Organising team: Pedro **Lealdino Filho*** (1), Christian **Bokhove** (2), Jean-Francois **Nicaud** (3),

Ulrich **Kortenkamp** (4), Mohamed **El-Demerdash** (1), Manolis **Mavriks** (5), Eirini **Geraniou** (5)

(1: Université Claude Bernard – Lyon I, France; 2: University of Southampton; 3: University of Grenoble;

4: University of Postdam; 5: London Knowledge Lab)

EXPLORING AND MAKING ONLINE CREATIVE DIGITAL MATHS BOOKS FOR CREATIVE MATHEMATICAL THINKING.

Abstract: When we look at e-books, designed for mathematics education, we can distinguish two streams. On the one hand we see publishers of traditional Mathematics textbook come with digital versions of their products, mostly static pdf-documents that can be downloaded and used on different devices. Anticipating on new interactive possibilities, sometimes limited interactivity is built in. On the other hand we see innovative groups of designers that traditionally develop highly interactive tools and micro-worlds for mathematics education. The European 'MC-squared' project aims to start several so-called 'Communities of Interest' (CoI) in a number of European countries (Fischer, 2001) that work on digital, interactive, creative, mathematics textbooks, called c-books. The c-books are authored in the MC-squared platform in which authors can construct books with various interactive 'widgets'. This workshop aims to introduce the project and acquaint participants with the affordances and authoring process of the MC-squared platform.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 0077

Organising team: Tatsuya **Mizoguchi*** (1), Hideki **Iwasaki** (2), Susumu **Kunimune** (3), Hiroaki **Hamanaka*** (4), Takeshi **Miyakawa*** (5), Yusuke **Shinno*** (6), Yuki **Suginomoto*** (7), Koji **Otaki*** (8) (1: Tottori University; 2: Hiroshima University; 3: Shizuoka University; 4: Hyogo University of Teacher Education; 5: Joetsu University of Education; 6: Osaka Kyoiku University; 7: Nagasaki University; 8: Hokkaido University of Education)

CURRICULUM DEVELOPMENT IN THE TEACHING OF MATHEMATICAL PROOF AT THE SECONDARY SCHOOLS IN JAPAN

Abstract: In the workshop, we aim to share a theoretical framework as well as some issues on the teaching of mathematical proof throughout six years (grade 7-12) of secondary schooling in Japan. The difficulties faced by students in learning mathematical proof are well-known (e.g., Reid & Knipping, 2010). Although the present research project is targeting Japanese mathematics curriculum, in developing a framework we attempt to synthesize multiple theoretical perspectives well known within the international mathematics education community in order to enable the framework to be comparable with those in other countries. Key questions in the workshop are as follows: (1) What kinds of teaching contents should be included in the secondary curriculum for the teaching of mathematical proof? (2) What kinds of evolution should be envisioned in the course of the curriculum? (3) How can we allow comparing different curriculums of the teaching of mathematical proof with different countries in terms of our proposed framework?

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30 – 18.00

Location: D: yellow, West Wing Building, room 220

Organising team: Miguel **Ribeiro*** (1), Arne **Jakobsen*** (2), Alessandro **Ribeiro*** (3), Nick H. **Wasserman*** (4), José **Carrillo*** (5), Miguel **Montes*** (5), Ami **Mamolo*** (6) (1: State University of Campinas – UNICAMP; 2: University of Stavanger; 3: Federal University of ABC – UFABC; 4: Teachers College, Columbia University; 5: University of Huelva; 6: University of Ontario Institute of Technology)

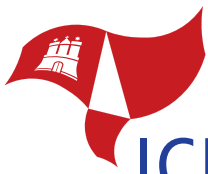
REFLECTING UPON DIFFERENT PERSPECTIVES ON SPECIALIZED ADVANCED MATHEMATICAL KNOWLEDGE FOR TEACHING

Abstract: Teachers' knowledge assumes a major role in practice and in the students learning and achievement. In particular, the construct of horizon knowledge or, what can be termed specialized advanced mathematical knowledge for teaching (in order to capture the overall perspectives we are dealing with within this proposal) has been the focus of attention from some researchers with different foci of attack (e.g., Carrillo, Climent, Contreras, & Muñoz-Catalán, 2013; Jakobsen, Thames, Ribeiro, & Delaney, 2012; Wasserman & Stockton, 2013; Zazkis & Mamolo, 2011). In that sense, and aiming to deepen our understanding of such a construct, the aim of this working group is to discuss and reflect upon, different theoretical perspectives, methodological approaches and analytic methods used when focusing on such specialized advanced mathematical knowledge for teaching. In particular, we consider the activities of analysing and conceptualizing situations where access and development of such teachers' knowledge is of primary importance.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

WS





Time: Friday, 29 July 2016, 16.30–18.00

Location: H: orange, Educational Building, room 211

Organising team: Alexander **Schueler-Meyer***
(TU Dortmund University)

USEFUL TOOLS – SOFTWARE FOR (YOUNG) RESEARCHERS IN MATHEMATICS EDUCATION

Abstract: There is a huge variety of computer programs, which can be more or less useful for (young) researchers in Mathematics Education. They range from tools to help you organize your literature (e.g. Citavi, Zotero or Endnote), analyze your data (e.g. MaxQDA, SPSS, NVIVO) or less specific programs which can be used for to-do lists and taking notes (e.g. Evernote, EndNote or OneNote). In this workshop, we will shortly introduce some of the mentioned programs and their main functions. Then, we'll invite participants to share their own experiences, tips and tricks of which programs have proven useful for them and how they can facilitate the work and life of a young researcher. Participants are encouraged to bring their own laptops to the workshop.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30–18.00

Location: E: mint, Economical Building, room 2163/2168

Organising team: Eric **Siegel*** (1), Rachel **Woolley*** (2)
(1: Generation Ready; 2: New York City Public Schools)

STRATEGIES FOR TEACHING MATHEMATICS TO STUDENTS LEARNING A SECOND LANGUAGE

Abstract: In the past, mathematics was often thought to be a refuge for second language learners, a subject whose numbers and symbols could be understood by all. Today, however, it is understood that the learning of mathematics is mediated through language, creating special problems for students learning in a language in which they are not yet fluent.

Fortunately, research has surfaced a number of effective strategies for supporting second language learners to simultaneously learn mathematics while also learning the new language. One way to categorize these strategies is as follows:

- Making teachers' presentation of mathematical content more comprehensible
- Providing more opportunities for student talk
- Providing support for enriching student talk to ensure that it is mathematically meaningful

While touching on strategies from all three categories, our talk will focus intensively on classroom protocols for supporting meaningful student talk.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30–18.00

Location: B: dark-brown, East Wing Building, room 123

Organising team: Santhanam **Sundaram Ramachandran***
(Sri Prakash Synergy School)

FRAMING NON-ROUTINE PROBLEMS IN MATHEMATICS FOR GIFTED CHILDREN OF AGE GROUP 11 – 15

Abstract: The main aim of the workshop is to make the participants to coin non-routine problems in number patterns and elementary algebra. The underlying ideas are a) when several odd or even numbers with some restrictions are multiplied then a pattern is observed in the product and b) the simplifications of algebraic expressions can be successfully employed to solve some elementary number theory problems. These ideas are very useful for teaching gifted children, because they expect problems which involve

higher level of thinking. Two nonroutine problems one on each of the above mentioned concepts will be worked out through power point presentation to the participants by Dr. S. R. Santhanam.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30 – 18.00

Location: E: mint, Economical Building, room 3016

Organising team: Ileana **Vasu***
(Holyoke Community College/University of Massachusetts)

ENACTED MULTIPLE REPRESENTATIONS OF CALCULUS, STUDENT UNDERSTANDING AND GENDER

Abstract: Despite interest in multiple representations as a trademark of mathematical success, Calculus instruction is mostly symbolic in nature and lacks consideration of gender specific issues in learning. Well-chosen representations are powerful at conveying mathematical concepts. They can be effective at the novice level or for students who perceive themselves as weak in math. They may also provide access to mathematical concepts for those students who lack operational expertise. Participants will exchange ideas about the role of mathematical representations in the curriculum as they explore connections between representations in the curriculum and student understanding, with an emphasis to gender. We will explore curricular materials, then in small groups we will design our own Calculus mini-lesson using multiple representations. We will convene in the whole group format to share ideas, and discuss key questions. In a final wrap-up session, the facilitator and participants will flesh out common themes, patterns, and notable emergent ideas. If possible bring copies of Calculus exams and a few sample pages from a Calculus text. You may also email them to the presenter at ivasu@hcc.edu

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

WS

Time: Friday, 29 July 2016, 16.30 – 18.00

Location: K: purple, Law Building, room 18/19

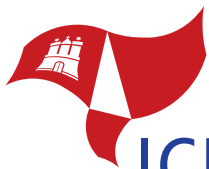
Organising team: Christine **von Renesse***, Volker **Ecke***
(Westfield State University)

USING INQUIRY TO TEACH MATHEMATICS IN SECONDARY AND POST-SECONDARY EDUCATION

Abstract: Using active learning and inquiry approaches in the mathematics classroom has positive effects on students' beliefs, attitudes and learning outcomes, see for instance the study by Fremann et al. Yet it is difficult for teachers to make the shift from traditional lecture style to a more active classroom happen, partially because most of us only experienced traditional teaching ourselves. In this Workshop participants will first experience inquiry-based learning as students. We will then use the shared experience to discuss inquiry-based teaching and learning: what does it feel like as a student, what gets in the way of teachers exploring this way of teaching, and what are some of the many tools helpful for teaching successfully using inquiry (see e.g. www.artofmathematics.org/classroom). Both facilitators are co-principal investigators of the project "Discovering the Art of Mathematics" which is dedicated to bringing inquiry-based learning into the mathematics classrooms from elementary school through university.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.





Time: Friday, 29 July 2016, 16.30–18.00

Location: B: dark-brown, East Wing Building, room 122

Organising team: Kazumi **Yamada***, Takaaki **Kihara***
(Niigata University)

MAKING CARDS AS MATERIALS FOR TEACHING SPATIAL FIGURES

Abstract: A static figure is used in the learning of plane figures. In contrast, it is important to present shapes with spatial extent and dynamic movement when teaching spatial figures. The following are the advantages of using the creation of pop-up cards as a teaching material. When making a card, a three-dimensional card is completed by trial and error, making a cut in a plane (the card), and opening and closing the folded card repeatedly. In this fabrication process, instruction connects the plane figures with the spatial figures. A popup card, called "origamic architecture," is especially effective as a teaching material for this purpose. When you open a card that is folded in two, to 90° , a three-dimensional object appears. When you flatten the card, it is returned to its original state.

To see works of origamic architecture, please refer to this website <http://www.japandesign.ne.jp/IAA/chatani/> of Masahiro Chatani. Now, there are a lot of lovers of origamic architecture all over the world.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

Time: Friday, 29 July 2016, 16.30–18.00

Location: B: dark-brown, East Wing Building, room 120

Organising team: Janchai **Yingprayoon***
(Suan Sunandha Rajabhat University)

CREATIVE MATHEMATICS HANDS-ON ACTIVITIES IN THE CLASSROOM

Abstract: Many children find that Mathematics is difficult and boring. But they are curious and they love to have fun with exciting things around them. Appropriate activities can be found to stimulate them to have fun and love to learn Mathematics. The workshop will show ways to develop creativity in Mathematics and Technology Education to increase intellectual curiosity, to develop problem solving and thinking skills, to promote discovery as well as to unleash creativity. In the workshop, the participants will share with each other how to make Mathematics lessons more meaningful, effective and interesting, how to cultivate intrinsic motivation for learning Mathematics, and how to develop thinking abilities, problem-solving skills and creativity.

Every participant will receive a fun and creative activity pack. Samples of creative hands-on activities will be demonstrated as follow: Curves in Nature, Reaction Time Test, Simple Balance, Mathematics of Robot arms, Augmented Reality (AR) in Mathematics Education.

Details of the workshop and the timetable can be found in the programme at the website and in Conftool.

WS

Workshops

WS





Hands-on Mathematics – An Exhibition from the Mathematikum Gießen

Albrecht **Beutelspacher** (Mathematikum Gießen & Justus-Liebig-Universität Gießen, Germany)

Opening: Monday, 13.00–19.00 / Tuesday to Saturday 09.00–19.00

Location: J: red, Auditorium Maximum, Lobby at the first and second floor

The Mathematikum Gießen is one of the world's first mathematical science centers. It contains more than 150 interactive exhibits, which attract about 150,000 visitors each year. The idea of Mathematikum is to give everybody a chance to make a first step into mathematics. About half of the visitors are school classes, the other half are private visitors, mainly families.

The exhibits include puzzles, mirror experiments, and soap film experiments; the visitors can build bridges, start a ball race, and measure the golden section at themselves. They learn in an intuitive way about functions, optimization, and randomness. Questions to be posed: How can a bridge be constructed without using any nails, glue, ropes or other tools? How is rolling dice related to Mozart's compositions?

The experience of 20 years working with mathematical experiments is that this is an ideal first step into mathematics. Being amazed is the first step to get behind mathematical secrets. Our different and very playful way of dealing with mathematics helps to overcome any fears people might have recalling their experiences with mathematics in school. It is in fact one step into mathematics, since the challenges of the exhibits are solved by careful thinking and grasping the right idea. On the other hand, it is of course only one step (and many more could follow), since a formal description and understanding is far beyond the possibilities of an exhibition.

In addition Mathematikum offers a special section for 4 to 8 year old children, the "Mini-Mathematikum". It is often visited by kindergarten groups.

Mathematikum has also a few travelling exhibitions, which travel in Europe, but also – with the help of the Goethe Institute – all over the world.

The participants of ICME-13 have the possibility to experience a representative selection of the Mathematikum's exhibits. In total, there will be more than 40 exhibits, including a few exhibits coming from the Mini-Mathematikum. All exhibits include an explanation in English and German, Albrecht Beutelspacher and his team will be present for explanations and sharing experiences.

Hopefully all visitors of the exhibition at ICME-13 will share the feeling that "math makes you happy". In any case, they will leave the exhibition happier than they entered it.

mathematikum
Mathematik zum Anfassen.

Early Career Researcher Day

Early Career Researcher Day 24th July 2016

08.30 – 08.50 Opening:

Welcome by Gabriele **Kaiser**, Ferdinando **Arzarello**, Armin **Jentsch**, Thorsten **Scheiner**

Location: H: orange, Educational Building, lecture hall

Thematic Block A: Empirical methods (parallel workshops)

Time: Sunday, 24 July 2016, 09.00 – 12.00

A – 01. Design research

Koeno **Gravemeijer**, Susanne **Prediger** (1: Eindhoven University of Technology; 2: TU Dortmund)

Location: H: orange, Educational Building, room 105

A – 02. Mixed methods

Nils **Buchholtz** (University of Hamburg)

Location: H: orange, Educational Building, room 212

A – 03. Video-based research

David **Clarke**, Esther **Chan**, Carmel **Mesiti** (University of Melbourne)

Location: H: orange, Educational Building, room 208

A – 04. Qualitative text analysis

Udo **Kuckartz** (Philipps-Universität Marburg)

Location: H: orange, Educational Building, room 207

A – 05. Grounded Theory

Anne **Teppo**, Maike **Vollstedt** (University of Bremen)

Location: H: orange, Educational Building, room 08

A – 06. Use of educational large scale assessment data for research on mathematics didactics

Sabine **Meinck**, Oliver **Neuschmidt**, Milena **Taneva** (IEA DPC)

Location: H: orange, Educational Building, room 209

A – 07. Socio-cultural studies

Alan **Bishop** (Monash University)

Location: H: orange, Educational Building, room 106

A – 08. Ethnographic studies

Judit **Moschkovich** (University of California, Santa Cruz)

Location: H: orange, Educational Building, room 06

A – 09. Argumentation analyses

Christine **Knipping**, David **Reid** (Universität Bremen)

Location: H: orange, Educational Building, room 211

A – 10. Interaction analyses

Marcus **Schütte** (TU Dresden)

Location: H: orange, Educational Building, room 21

A – 11. Networking theories

Angelika **Bikner-Ahsbahr** (1), Tommy **Dreyfus** (2)

(1: Universität Bremen; 2: Tel Aviv University)

Location: H: orange, Educational Building, room 07

EC





Thematic Block B: Important mathematics educational themes

Time: 09.00 – 10.15 (Parallel lectures)

B – 01. Theoretical aspects of mathematics education research

Stephen **Lerman** (London South Bank University)

Location: H: orange, Educational Building, lecture hall

B – 02. Frameworks and principles for task design in mathematics education

Carolyn **Kieran** (Université du Québec à Montréal)

Location: I: blue, Philosophical Tower, lecture hall E

B – 03. False choices in research paradigms: Studies of knowledge AND social interaction

Andrea **diSessa** (University of California, Berkeley, United States of America)

Location: I: blue, Philosophical Tower, lecture hall F

Time: 10.45 – 12.00 (Parallel lectures)

B – 04. International comparative studies

Kaye **Stacey** (University of Melbourne)

Location: I: blue, Philosophical Tower, lecture hall F

B – 05. The professional education and development of teachers

Ruhama **Even** (Weizmann Institute of Science)

Location: I: blue, Philosophical Tower, lecture hall E

B – 06. Thinking about mathematics as discourse:

What difference does it make for educational research and practice

Anna **Sfard** (University of Haifa)

Location: H: orange, Educational Building, lecture hall

Thematic Block C: Academic writing and academic publishing

Time: 13.00 – 13.50

C – Plenary presentation of major journals

Presenters: Marilyn **Goos** (ESM), Jinfa **Cai** (JRME), Marcelo **Borba** (ZDM), Carolyn **Maher** (JMB), Olive **Chapman** (JMTE), Peter **Liljedahl** (IJSME), Charalambos **Charalambous** (MTL)

Location: H: orange, Educational Building, lecture hall

Time: 14.00 – 15.30

The activities to academic writing and academic publishing take place in parallel.

Academic writing (Parallel sessions)

C – 01. Academic writing

Aiso **Heinze** (IPN Kiel)

Location: H: orange, Educational Building, room 21

C – 02. Academic writing

Cynthia W. **Langrall** (Illinois State University)

Location: H: orange, Educational Building, room 08

C – 03. Academic writing

Helen **Forgasz** (Monash University)

Location: H: orange, Educational Building, room 105

C – 04. Academic writing

Jeremy **Kilpatrick** (University of Georgia)

Location: H: orange, Educational Building, room 05

Early Career Research Day

C – 05. Academic writing

Norma **Presmeg** (Illinois State University)

Location: H: orange, Educational Building, room 06

C – 06. Academic writing

Richard **Barwell** (University of Ottawa)

Location: H: orange, Educational Building, room 106

C – 07. Academic writing

Vince **Geiger** (Australian Catholic University)

Location: H: orange, Educational Building, room 20

Academic publishing (Parallel sessions)

Discussion with one editor of the presented journals.

Time: 14.00 – 14.40

C – 08. Mathematical Thinking and Learning (MTL)

Charalambous **Charalambos**

Location: H: orange, Educational Building, room 208

C – 09. Journal of Mathematical Behavior (JMB)

Carolyn **Maher**

Location: H: orange, Educational Building, room 207

C – 10. Journal for Research in Mathematics Education (JRME)

Jinfa **Cai**

Location: H: orange, Educational Building, room 211

C – 11. ZDM Mathematics Education (ZDM)

Marcelo **Borba**

Location: H: orange, Educational Building, room 205

C – 12. Educational Studies in Mathematics (ESM)

Merrilyn **Goos**

Location: H: orange, Educational Building, room 206

C – 13. Journal of Mathematics Teacher Education (JMTE)

Olive **Chapman**

Location: H: orange, Educational Building, room 209

C – 14. International Journal of Science and Mathematics Education (IJSME)

Peter **Liljedahl**

Location: H: orange, Educational Building, room 212

Time: 14.50 – 15.30

Presentation of the same journals by their editors in the same room, participants change rooms.

Thematic Block D: Looking ahead

Sunday, 24th July 2016, 16.00 – 17.30

What Makes for Powerful Classrooms, and How Can We Support Teachers in Creating Them?
A Story of Research and Practice, Productively Intertwined

Alan **Schoenfeld** (University of California, Berkeley)

Location: H: orange, Educational Building, lecture hall

EC



Teachers' activities at ICME-13

Within the framework of the 13th International Congress on Mathematical Education (ICME-13) special activities for teachers are offered, taking place from Wednesday, 27th July to Friday, 29th July 2016. The programme, which is run in German language, offers a special in-service programme with practice-oriented examples for innovative school development, novel classroom advancement with challenging teaching examples. The role of new technology will be reflected as well as the importance of elementary mathematics for the enhancement of the quality of mathematical teaching and learning processes. The teachers' activities are focusing primary and secondary pre- and in-service teachers.

The presentations covering lectures and workshops are offered by well-known scholars from mathematics education, mathematics and school practice.

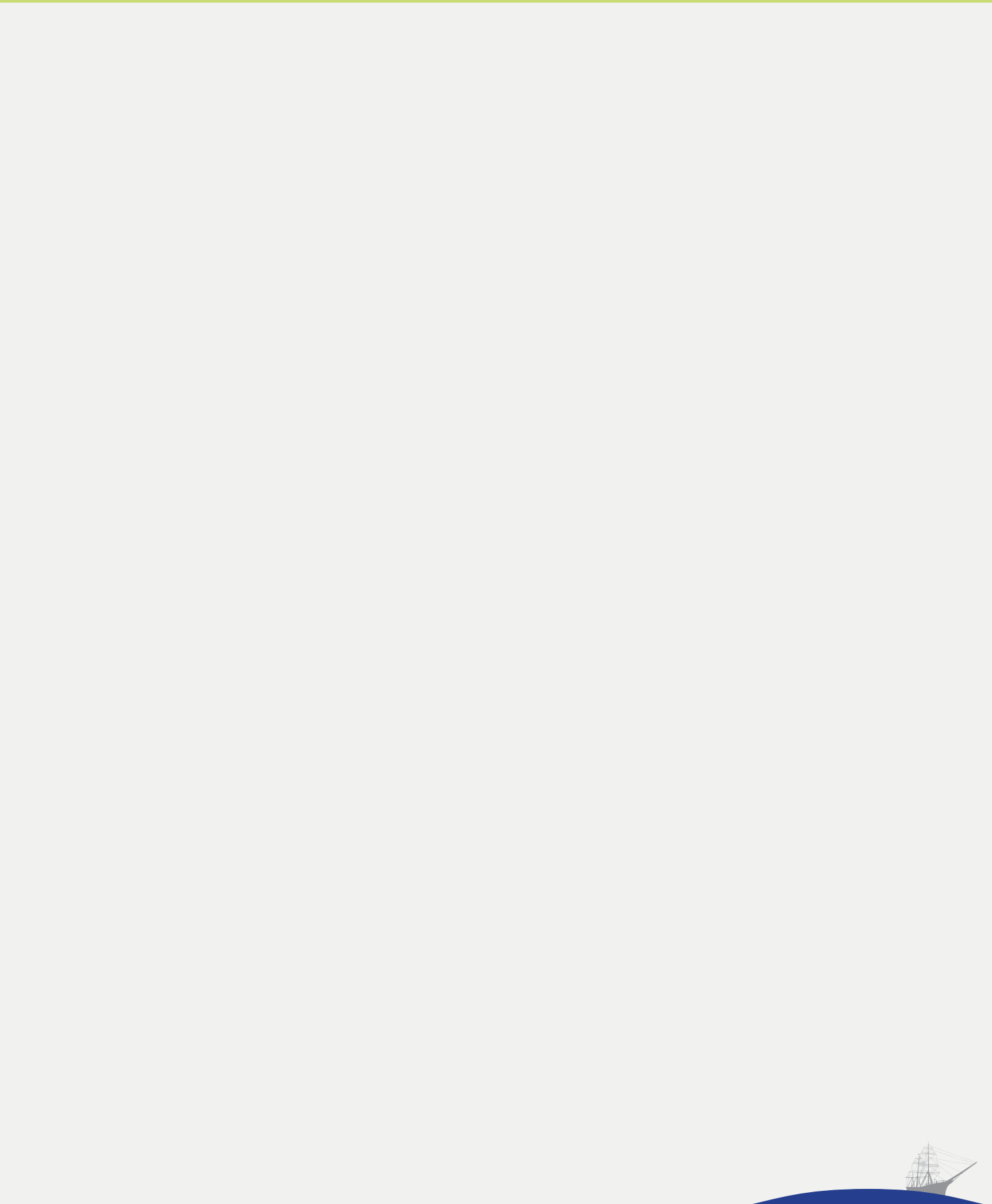
The themes cover, amongst others, basic ideas of central school mathematical concepts, inquiry-based learning, heuristic strategies in mathematics learning processes, origami as folded mathematics, inclusive mathematics education, language development in mathematics education, mathematics teaching and learning with heterogeneous students groups (covering students with dyscalculia and highly talented students), inclusion of modelling and real world examples in mathematics education.

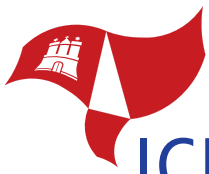
In addition a mathematical exhibition from the Mathematikum Gießen (responsible Albrecht Beutelspacher) offers a rich exhibition of hands-on mathematics with fascinating new ways to explore mathematics.

Within these activities Günter M. Ziegler from the Free University Berlin offers at Thursday, 28th July a lecture open to the interested public on the theme:

"Is that wrong, or is that art?" A challenging mathematical error search.

Details of the programme can be found at the website of ICME-13: <http://www.icme13.org/lehrkraefte>



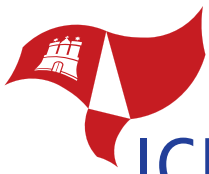


ICME13
Hamburg 2016

For your notes

For your notes



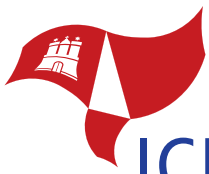


ICME13
Hamburg 2016

For your notes

For your notes





ICME13
Hamburg 2016

For your notes

Sponsors and Supporters

With special thanks to:



Deutsche
Mathematiker-Vereinigung



DGfE Deutsche Gesellschaft
für Erziehungswissenschaft



Deutsches Zentrum für
Lehrerbildung Mathematik



VERBAND ZUR FÖRDERUNG
DES MINT-UNTERRICHTS
BUNDESVERBAND



Bundesministerium
für Bildung
und Forschung



Hamburg

Behörde für Wissenschaft,
Forschung und Gleichstellung



Deutsche
Forschungsgemeinschaft



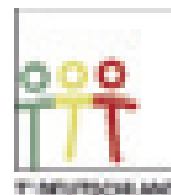
Springer

Deutsche
Telekom
Stiftung



Robert Bosch **Stiftung**

CASIO®



TEXAS
INSTRUMENTS



Hamburg
Convention
Bureau

