

### Editorial from Bronisław Czarnocha, the Chief Editor.

The Spring Issue of MTRJ brings an interesting collection of papers, which includes new types of submissions:

1. We open the Book Reviews section calling for reports on any interesting new books in math and math ed, both in mathematics, mathematics texts and textbooks. We start with an interesting book on trigonometry by Brenner and Maysonet reviewed by the Managing Editor, Malgorzata Marciniak.
2. We open the section on reports from Math Musea, exhibitions and local conferences, starting with the Museum of Children Creativity in San Francisco.

The Spring'18 issue brings in two important papers about the old topic of procedural/conceptual divide, an intriguing paper on the assessment of peer mentorship (high school/middle school) within the program Boy With a Ball and two papers dealing with advanced mathematics teaching.

Procedural/conceptual divide is a very important old and unresolved theme in math ed. TR Team of the Bronx has dealt with the topic in the context of remedial algebra and use of language in mathematics classrooms (Baker and Czarnocha, 2016; Czarnocha 2016) showing that well positioned use of language in mathematics classrooms increases the conceptual understanding and, what's unusual, it impacts positively learning of ESL.

Procedural/conceptual divide is closely related to process/object duality of algebra as well to the qualitative/quantitative debate.

Alioune Khoule paper show us in a very precisely executed teaching experiment "Practice Does Not Always Make You Perfect" that a systematic and persistent emphasis on conceptual understanding of algebra brings in strong positive learning effects by increasing both conceptual and procedural understanding of the subject. Note a nicely designed assessment of understanding test showing, in contradiction to many standard arguments, that indeed one can measure understanding in mathematics quite precisely.

On the other hand, Kim Mahowsky's presentation A Procedural Mindset in a Conceptual World of

Mathematics looks upon the same divide from the point of view of the 3<sup>rd</sup> grade teacher trying to teach mathematics with the help of the CCSM scripted lesson guide. Mahovsky observes and comments upon teacher's pedagogical decisions as teacher is teaching following the script. She focuses on teacher's decisions in following or omitting the suggestions of the conceptually designed script. She finds out the procedurally oriented bias in the sequence of teacher's decisions.

Both papers address the same issue: the resistance to conceptual understanding both by elementary teachers and faculty professors to whom Khoule's paper is directed, among others. Both of the papers suggest several questions:

1. Why, despite the research evidence and the design of Common Course curriculum there is such a resistance to conceptual understanding of mathematics?

2. Is the procedural/conceptual framework correct framework for understanding the issues of the procedural/conceptual divide?
3. Is scripting lesson guide the best method to involve teachers in conceptual thinking about mathematics they teach?

Ping Ye, Whitney Richardson, Derek Allen, Aneta Galazka, William Fayson and Huijun Yi

in their presentation *Analyzing Student Data As A Measurement of Success for Boy With A Ball*

perform the assessment of the extremely successful in turning youth in high-risk back to school program Boy With the Ball. The program is based on peer mentoring (high school→middle school) and the paper shows us the method of quite precise assessment of the successes of the program. One of its central results turned out to be that a sense of connectedness with community-family plays an important role in the BWAB program.

Peer mentoring finds strong support in MTRJ. It shows success in US among the disadvantaged student population such as Hostos CC. TR Team of the Bronx conducted recently a teaching experiment on facilitation of the creativity of Aha!Moment and found out that peer mentors were the most successful in producing such moments.

The next two papers take the advanced mathematical thinking under their scrutiny.

Abram, Dagan, Satianov and Yoshpe point to the creativity inherent in introducing non-standard approaches to classical subjects such as extrema. Usually solved with the help of calculus, the authors introduce and *Use Algebraic Inequalities to Solve Extremum Problem*. There is a long standing tradition of algebraic approaches to classical calculus problems and authors' paper is an important extension of that tradition. The extension which is very rich in carefully constructed examples and applications.

On the other hand, Dimitric's paper *Feedback from Student Errors as a Tool in Teaching* connects the assessment emphasized by Peng et al above with the improvement of pedagogy, very much in the style of Teaching-Research, in the context of Calculus 3, Linear Algebra and Analytical Geometry. It's the presentation of a large scope grounded in critically assessed educational research literature and theories of learning. It ultimately focuses on the concept of the function and how to support it the best in advanced mathematics classrooms. It uses interesting metaphors such as "bread sticks" or "grinding machine" to make the concept of function closer to every day's experience of students.

Baker, Czarnocha (2016) From Arithmetic to Algebra: A Sequence of Theory-Based Tasks in  
B.Czarnocha, W. Baker, O. Dias, V. Prabhu (Eds) *Creative Enterprise of Mathematics Teaching-  
Research*. Sense Publishers, Netherlands

Czarnocha (2016) Algebra/English as a Second Language Teaching Experiment. in B.Czarnocha, W.  
Baker, O. Dias, V. Prabhu (Eds) *Creative Enterprise of Mathematics Teaching-Research*. Sense  
Publishers, Netherlands