ICME 2021 Shanghai
DG6: Variations and Series of Tasks, Crossing the Approaches
July 14, 21:30–23:00 Location: W111
Organizers: Katalin Gosztonyi (Eötvös Loránd University of Budapest, Hungary);

Others: Charlotte de Varent (Université de Rennes 2, France); Luxizi Zhang (École Normale Supérieure de Lyon, France, East China Normal University, China); Alessandro Ramploud (University of Pisa, Italy)

Description:
This discussion group aims to extend a discussion led by some senior and young researchers from four different countries since some years about variations and series of tasks. Katalin Gosztonyi wrote her PhD (2015) on the comparison of the Hungarian reform of mathematics education led by Varga (pointing out the importance of structuring problems in series and networks) and the French "mathématiques modernes" reform. Charlotte de Varent wrote her PhD (2018) on the use of history in mathematics education, pointing out the importance of small numerical variations in Mesopotamian scholarly context. Luxizi Zhang is working on her PhD (Zhang, 2019) towards an analytic model of "teaching mathematics through variation" from the analysis of teachers' documentation work (Gueudet & Trouche, 2009) in China and France, making profit of the variation theory (Gu, Huang, & Marton, 2004) and the notion of didactic variable in the theory of didactical situations (Brousseau, 2002).
As the above mentioned examples illustrate, the 'variation perspective' (what will mean in the followings: variation as well as sequencing and networking of tasks and problems) appears as an important issue in various traditions of mathematics education, and at the core of teachers' documentation work.
International discussions where launched on this topic since some years: the "Series of problems" interdisciplinary historical research project (2012-2019) (Bernard 2015), the first (2018, Budapest) and the second (2019 Lyon) "Variations and series of problems" workshop, and the Varga100 conference (2019 Budapest, https://varga100.sciencesconf.org/).

The aim of these discussions was to confront different implementations of this 'variation perspective', towards a common model, or a diversity of models, allowing on one hand to develop analytical tools for researchers, and on the other hand to support teachers design work. We consider that the ICME14, in the country of the Chinese "variations method" and thanks to the diversity of the conference's public, would be a particularly well adapted context for the continuation of this collective work.

References

- Brousseau, G. (2002). Theory of Didactical Situations in Mathematics. Netherlands: Springer.

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- Gu, L., Huang, R., & Marton, F. (2004). Teaching with variation: A Chinese way of promoting

effective mathematics learning. In L. Fan, N. Y. Wong, J. Cai, & S. Li (Eds.), How Chinese learn

mathematics: Perspectives from insiders (pp. 309–347). Singapore: World Scientific.
- Gueudet, G., & Trouche, L. (2009). Towards new documentation systems for mathematics

teachers? Educational Studies in Mathematics, 71(3), 199-218.
- Varent, de. C. (2018). Pluralité des concepts liés aux unités de mesure. Liens entre histoire des scienceset didactique, le cas de l'aire du carré dans une sélection de textes anciens. (Unpublished doctoraldissertation). Paris 7 Diderot University, Paris, France.

Planned Activities & Working Format & Responsible Person

21:30–21:40 Introduction

(The coordinators, plenary)

21:40–21:55 Presentation of the Chinese, Hungarian and French Handouts

(L. Zhang, K. Gosztonyi plenary)

21:55–22:15 Analyzing the Data, Extracting Principles with Special Focus on the Structure of the Task Sequences. Comparing to the Participants' Teaching Traditions

Work in small groups.

22:15–22:35 Sharing the Results of the Four Groups

Collective discussion

22:35–22:45 Italian Adaptation of the Chinese Variation

(A. Ramploud, plenary)

22:45–23:00 General Conclusions + Potential Plans for Further Research

(The coordinators, plenary)