



TSG 11

TEACHING AND LEARNING OF PROBABILITY

The Organizing Team

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The goal of TSG 11: Teaching and Learning of Probability, in general, is to continue the relatively recent, albeit ever-growing trend of providing a dedicated venue to promote the discussion of a variety of perspectives related to probabilistic thinking and the learning and teaching of probability. TSG 11 will provide an overview of the international discussion on probability education, as broadly as possible, by building upon the more recent literature from the field (e.g., Batanero & Borovcnik, 2016; Borovcnik & Kapapdia, 2009; Biehler & Pratt, 2012; Chernoff et al., 2016; Chernoff & Sriraman, 2014; Langrall et al., 2017; Pratt & Kazak, 2018). In particular, though, TSG 11 will make every effort to display the progress of the discussion in the intervening years since ICME-13 (e.g., Batanero & Chernoff, 2018; Batanero et al., 2016) and ICME-12. Lastly, we would be remiss not to mention that we will, to the best of our ability, allow for insight into less well-known strands of the discussion from researchers around the world, especially those from under represented countries.

In order to meet these general and specific objectives, we have identified the following subthemes for TSG 11:

Conceptual frameworks to develop probabilistic thinking. To continue the emerging creation of frameworks to describe or model the development and growth of probabilistic thinking of students especially at intermediate and tertiary levels. In particular, it is important to discuss models of students' process of integrating the different philosophical interpretations of probability.

Connecting probability with statistics. The development of probabilistic notions through experiments, data explorations and simulations can help students to build basic connections

between statistics and probability, but it is required to understand how the process of concept formation emerges in students under such conditions.

The role of technology in teaching and learning probability. The availability of increasingly powerful technology and software for statistical and probabilistic education requires, in addition to the inherent innovation, a parallel development of the theoretical reflection and conceptualization of empirical experiences.

Task design and learning trajectories. One way to ensure that the knowledge accumulated by research in education in probability becomes educational practices is through the design of tasks and learning trajectories to promote the thinking and reasoning of integrated probabilistic concepts, including modeling processes.

Probabilistic knowledge for teaching. Understanding and deepening the knowledge that teachers need to teach probability can help solve the problem of their learning so that they provide a comprehensive education that includes probability. The availability of models that describe and conceptualize the probabilistic knowledge of teachers and their relationship with their teaching practice is important.

Other related notions. We, of course, welcome submissions that fall outside the presented topics but within the teaching and learning of probability.

References

- Batanero, C. & Borovcnik, M. (2016). *Statistics and probability in high school*. Rotterdam: Sense Publishers.
- Batanero, C. & Chernoff, E. J. (Eds.) (2018). *Teaching and Learning Stochastics: Advances in Probability Education Research* [ICME-13 Monograph Series]. Berlin/Heidelberg: Springer Science.
- Batanero, C., Chernoff, E. J., Engel, J., S. Lee, H. & Sanchez, E. (2016). *Essential Research on Teaching and Learning Probability* [ICME-13 Topical Surveys Series]. Springer.
- Biehler, R., & Pratt, D. (Eds.) (2012). Probability in reasoning about data and risk. *ZDM—The International Journal on Mathematics Education*, 44(7), 819–952.
- Borovcnik, M., & Kapadia, R. (Eds.) (2009). Research and developments in probability education [special issue]. *International Electronic Journal of Mathematics Education*, 4(3).
- Chernoff, E. J., Papanastasiou, E., Bakogianni, D., & Petocz, P. (Guest Editors) (2016). Special Issue: Research on learning and teaching probability within statistics. *Statistics Education Research Journal*, 15(2).
- Chernoff, E. J., & Sriraman, B. (Eds.) (2014). *Probabilistic Thinking: Presenting Plural Perspectives*. Berlin/Heidelberg: Springer Nature.
- Langrall, C. W., Makar, K., Nilsson, P. & Shaughnessy, J. M. (2017). Teaching and Learning Probability and Statistics: An Integrated Perspective. In J. Cai (Ed.), *Compendium for Research in Mathematics Education* (pp. 490-525). Reston: National Council of Teachers of Mathematics.
- Pratt D., Kazak S. (2018) Research on Uncertainty. In: Ben-Zvi D., Makar K., Garfield J. (Eds.) *International Handbook of Research in Statistics Education*. Springer International Handbooks of Education. Springer, Cham.