

**USING INQUIRY TO TEACH MATHEMATICS  
IN SECONDARY AND POST-SECONDARY EDUCATION**

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*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 Freeman, et al [1]. 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 the 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 faculty exploring this way of teaching, and what are some of the many tools helpful for teaching successfully using inquiry (see [2] or <https://artofmathematics.org/classroom/mathematical-conversations>). Both facilitators are co-principal investigators of the project "Discovering the Art of Mathematics" which is dedicated to bringing inquiry-based learning into mathematics classrooms from elementary school through university.*

**Planned structure:**

Insert the planned structure of the Workshop here after leaving ONE empty line below the abstract. Please use this style for the timetable and insert necessary rows. Due to technical reasons the timetable shall not exceed 10 rows.

Planned timeline	Topic	Material / Working format / presenter
45 minutes	Experiencing inquiry-based learning as a student.	<a href="http://www.artofmathematics.org/books">www.artofmathematics.org/books</a> Facilitator: Christine v. Renesse
30 minutes	Participants discuss their experiences as students in an inquiry classroom and analyze the teacher moves of the facilitators.	<a href="http://www.artofmathematics.org/classroom">www.artofmathematics.org/classroom</a> Facilitator: Volker Ecke
15 minutes	The project "Discovering the Art of Mathematics" will be briefly introduced.	Presenter: Christine von Renesse

**References:**

[1] Freeman, S, et al. "Active Learning Increases Student Performance in Science, Engineering, and Mathematics." *Proceedings of the National Academy of Sciences*. (2014).

<http://www.pnas.org/content/111/23/8410.full>

[2] Ecke, V. and von Renesse, C. [\*Inquiry-Based Learning and the Art of Mathematical Discourse\*](#), *PRIMUS*, Volume 25, Issue 3, 2015.