ENGINEERING STUDENTS’ LEARNING OF MATHEMATICS: ADDRESSING MATHEMATICAL COMPETENCIES

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Little research has been conducted to explore engineering students’ learning of mathematics, in particular with respect to what mathematical competencies are needed for engineers, how engineering students’ understanding and use of mathematics can be captured and described even concerning their learning strategies (Glasmachers, Griese, Kallweit & Rösken, 2011), and how inquiry based learning can help students to come to know and apply mathematical concepts (Jaworski, 2011). The Discussion Group brings together approaches, perspectives, and communities of practice in the fields of mathematics and engineering. In particular, the following lenses will be differentiated:

**Competence framework**: What mathematical competencies are needed for engineering students? How can such competencies be operationalized and measured?

**Workplace analysis**: What mathematical topics should be taught and learned? What didactical constructs does mathematics education provide to analyze students’ use of mathematics in engineering contexts?

**Learning through inquiry**: How does the learning take place? How can inquiry based learning help to develop meaning of mathematical objects?

**Session 1**: Presenting the different lenses (strand 1 – Roesken-Winter, strand 2 – Hochmuth, strand 3 – Jaworski): Presentations (10 min. per presentation), small group discussion (three groups, 45 min.), plenary discussion (15 min.)

**Session 2**: Integrating the three lenses first to investigate competences with respect to learning and teaching processes: discussion on aims and consequences, and second to measure competences with respect to learning and teaching processes: paths to reliable and valid competence measurement. (Plenary discussion (10 min.), small group work (two groups, 60 min.), summarizing the results of the two groups (group leaders, 10 min.), implications for future work (10 min.).

**References**
