

Evaluation UV9362 – Spring 2026

Measuring teachers' and students' mathematical competencies

Course leaders: Guri A. Nortvedt and Jelena Radišić

Number of participants: 10

Summary of course

UV9362 is a PhD course at the Faculty of Educational Sciences that addresses frameworks for describing mathematical competence and how this competence is operationalised in mathematics education research, with the aim of measuring the mathematical competence of students, student teachers and teachers. The three-day course addressed how mathematical competence can be conceptualised, operationalised and measured. Mathematical competence was understood broadly to include knowledge, skills, communication and the application of previously learned knowledge, as well as beliefs and attitudes about one's own competence.

The course combined lectures, whole-group discussions and presentations of participants' PhD studies. The teaching introduced and discussed frameworks and approaches to mathematical competence and its measurement. Topics included the operationalisation of mathematical competence; teachers' competence for teaching mathematics; mathematical competence frameworks and student outcomes; students' mathematical competence; beliefs, knowledge and practice in mathematics education; classroom observation systems as approaches to measuring instructional quality in mathematics; and competency demands in mathematical tasks. In addition to the course leaders, Hege Kaarstein and Alexander Selling contributed to the teaching.

Participating PhD candidates were asked to present their own studies, focusing particularly on how competence was conceptualised and operationalised, and on issues concerning frameworks and the measurement of mathematical competence. Each participant also served as a reactor to a fellow participant's presentation.

An important learning outcome of the course was that participants should be able to discuss how mathematical competence is operationalised in their own studies and to relate, compare, and contrast their approaches with established frameworks. The course also aimed to help participants situate their own studies within mathematics education research, identify potential contributions, and critically evaluate their strengths and limitations, including methodological questions about measuring the competence of students, student teachers, and teachers.

Summary of course evaluation including our considerations as course leaders

From our perspective, the course worked well overall. Participants engaged actively with the course content and with each other's research, and the discussions that developed throughout the course were a particular strength. This positive overall impression is supported by the written evaluation, in which all three respondents considered the course literature relevant and the teaching and course activities highly relevant.

The combination of lectures, whole-group discussions and work on participants' own PhD studies was designed to align the course learning outcomes with the teaching activities. The lectures provided conceptual and methodological perspectives on mathematical competence and its measurement, while participants' presentations and the reactor format offered opportunities to apply and critically discuss these perspectives in relation to their own research.

This format worked well. The course included ample discussion, and participants brought thoughtful questions to both the lectures and the discussions of individual PhD projects. The quality of the feedback they provided to one another was particularly valuable. The presentations and reactor format supported substantive exchanges around participants' own research and created opportunities to discuss different choices and challenges concerning conceptual frameworks, operationalisation and measurement. The student evaluations confirm this assessment: all three respondents indicated that the feedback they received, whether on their paper or in other ways, was helpful. With time allotted to all participants to present and discuss their own research, a fairly large proportion of course time is allocated to student presentations. However, because this facilitates active engagement among participants, we view it as a good use of time.

The course brought together several perspectives on mathematical competence and its measurement, ranging from students' and teachers' competence to beliefs and practices, instructional quality and mathematical task demands. This breadth of perspectives provided a productive basis for relating the course's broader conceptual and methodological questions to participants' different research projects. At the same time, the richness of the topics and discussions meant that additional time would have been useful. Several discussions could have been pursued further, and this is something we would consider when planning a future iteration of the course. All three respondents found the course literature to be relevant, with all three rating the teaching and activities as very relevant. One respondent mentioned that while all lectures were useful, one session felt more thematic than methodological. This insight is valuable for considering the balance between thematic and methodological focuses in future course versions.

Learning environment and participation

We experienced the learning environment as active and constructive. The candidates participated actively in discussions, asked thoughtful questions and engaged seriously with each other's research. Participants exchanged ideas productively, particularly during the candidate presentations and peer feedback. Participants' willingness to discuss their own methodological and conceptual choices, as well as to engage with the choices made in other projects, contributed positively to the learning environment. One master's student participated on day two of the course and was welcomed into the discussions by the PhD candidates.

The written evaluation shows that candidates were highly engaged: all three respondents expressed satisfaction with their own efforts. This aligns with our observation of a group that actively participates.

Workload and organisation

The three-day format provided a concentrated setting for lectures, presentations and discussion. All three respondents found the course duration suitable and reported that the information and instructions were straightforward to locate and understand. None of the respondents saw a need for any improvements in the course details and guidance.

From our perspective, the level of engagement and the quality of the discussions meant there was potential to spend more time on several of the issues that emerged during the course. For a future iteration, we would therefore consider whether somewhat more room could be created for discussion and feedback within the existing format, while retaining the combination of lectures, participant presentations and the reactor format, which we found worked well.

Student feedback

Three participants responded to the written course evaluation, with feedback consistently positive across the main areas. Due to the small sample, these results should be viewed as feedback from these three individuals rather than representative of the entire group. All three found the course literature relevant and rated the teaching and activities as very relevant. One participant noted that all lectures were helpful, though one session was more thematic than methodological.

Feedback during the course was also viewed positively, with all three respondents reporting the feedback was helpful. They expressed satisfaction with their own efforts, indicating active engagement. Regarding organisation, all considered the course duration appropriate, and found the information and instructions easy to access and understand. No suggestions for changes were offered.

Open-ended responses were limited but generally positive, including praise for the teachers. Overall, the evaluations suggest respondents viewed the course content, teaching, feedback, and organisation favourably. The only notable point was the mention that one session felt more thematic than methodological.