

**Logbook and link to video shots regarding observations of
experimental mathematics teaching in the KOMPIS Project:
*Oral exams, group 5 and 6***

Group 5 – June 25

- 10.27: G3 and L, GG, MMM120625-5A (1.11 min.)** P-L. L starts the exam and announces that the group – which is the observed group 3 – has drawn the fourth project on reasoning competency.
- 10.29: G3, EV, MMM120625-5B (16.18 min.)** KR-GE. The students begin to discuss what reasoning competency is and what points they should make. Reasoning is understood as drawing connections between premises, arguments, and conclusions, underlining that it is possible to work both “forwards” and “backwards” in this process. They effortlessly concretise their general discussion by providing specific examples from their project, not least their work with the game Logix.
- 10.47: K-N-S, EV** The students, individually, present and elaborate on their exam report.
- 10.48: J and L, EV, MMM120625-5C (5.14 min.)** KR-GE. J outlines the reasoning competency and an example with Sudoku from the report.
- 10.53: M and L, EV, MMM120625-5D (5.43 min.) (no subtitles)** KR-GE. M ditto.
- 10.58: TA and L, EV, MMM120625-5E (8.27 min.) (no subtitles)** KR-GE. TA ditto, with examples of first “forward” and then “backward” reasoning.
- 11.07: J and L, EV, MMM120625-5F (8.07 min.)** KR-GE and KR-K. J explains a new example from the report: a proof of the formula for calculating the area of a triangle. Afterwards, the external examiner asks J to prove that the area of a “kite shaped” square can be calculated as half the product of the two diagonals.
- 11.15: M and L, EV, MMM120625-5G (3.42 min.) (no subtitles)** KR-GE and KR-K. M is approached the same way, including the question with the “kite shape”.
- 11.19: TA and L, EV, MMM120625-5H (4.40 min.) (no subtitles)** KR-GE and KR-K. TA ditto.
- 11.24: J and L, EV, MMM120625-5I (1.01 min.)** KR-A. J argues persuasively as to why the indicated formula for the area of the “kite shape” is correct.
- 11.25: M and L, EV, MMM120625-5J (0.52 min.) (no subtitles)** KR-A. M ditto.
- 11.27: TA and L, EV, MMM120625-5K (1.13 min.) (no subtitles)** KR-A. TA ditto.
- 11.30: L and external examiner, EV** The students’ performances are discussed and assessed with a grade, which is presented and explained to the group of students. No footage. With three excellent presentations, the assessment is a simple matter.
- 11.45: End.**

Group 6 – June 25

- 12.30: L, GG, MMM120625-6A (1.08 min.)** P-L. L starts the exam and announces that the group – comprising Lu, M and T – has drawn the second project on application-critical competency. The group has worked with models for awarding points – e.g 2 or 3 points for a win – at soccer tournaments.
- 12.32: Lu-M-T, EV, MMM120625-6B (18.08 min.)** KM-TR. The students begin to discuss their work on this topic. They then evaluate their own project, but in very concrete terms, making no reference to the modeling process and focusing on corrections in the submitted project report.
- 12.50: Lu-M-T, EV** The students individually present and elaborate on their exam report.
- 12.51: Lu and L, EV, MMM120625-6C (5.03 min.) (no subtitles)** KM-VV and KS-O. Lu explains what he has included in his report. L asks about the visual presentation of the specific model, including a missing equals sign in a formula, and Lu talks about the importance of including different variables in the model. L then asks him to continue the process of delimitation of the model.
- 12.56: T and L, EV, MMM120625-6D (5.15 min.) (no subtitles)** KM-VV and K-L. T outlines the content of the report. L then asks T to prepare a presentation focusing on where they have critiqued the model, with reference to the four-phase model of the process used in lessons.
- 13.01: M and L, EV, MMM120625-6E (6.48 min.)** KM-VV and KS-A. M ditto, but without the meta requirements.
- 13.08: Lu and L, EV, MMM120625-6F (2.28 min.) (no subtitles)** KM-TR. With a strong focus on the concrete results of using different models, Lu elaborates her presentation. Afterwards, L encourages him to build a model for fair play.
- 13.10: T and L, EV, MMM120625-6G (3.13 min.)** K-L and KM-VV. T tries to explain at what points in the modelling process they have been critical in the concrete project, but finds this difficult. He is also encouraged to build a model for fair play.
- 13.13: Lu-M-T, EV** Work in silence.
- 13.18: Lu and L, EV, MMM120625-6H (5.58 min.) (no subtitles)** KM-MS, KS-O and K-L. Lu presents his model for fair play, and is asked by L to explain the rationale behind the variables he has introduced. Next, L invites him to explain where he has critiqued the model, with reference to the four-phase model of the process used in lessons. Lu really struggles with this.
- 13.22: T and L, EV, MMM120625-6I (3.22 min.)** KM-MS, KS-A and KS-M. T convincingly presents his model for fair play, including how he has used symbols to represent and combine the variables for, respectively, the number of yellow cards and the number of red cards awarded.
- 13.26: M and L, EV, MMM120625-6J (7.26 min.)** KM-MS and K-L. With a degree of uncertainty, M presents his model for fair play. Next, L invites him to explain where he has critiqued the model with reference to the four-phase model of the process used in lessons. He really struggles. Finally, the external examiner asks M to comment on a specific error regarding the magnitude of a calculated number, caused by the incorrect placement of a decimal point during the calculation process.
- 13.30: L and external examiner, EV** The students' performances are discussed and assessed with a grade, which is presented and explained to the group of students. No footage. The discussion concerns, among other things, how much of a difference it makes whether the student has a proper grasp of the content of the competency being assessed, as manifested by their ability to make constructive use of a model of the modelling process.
- 13.45: End.**

Abbreviations

Persons

- A All.
- L Teacher.
- T Tomas.
- J The girl J.
- TH The boy TH.
- AM The boy AM.
- M The boy M.
- AMA The girl AMA.
- MI The girl MI.
- TA The boy TA.
- G1 AM, J, M, TH.
- G2 AMA, J, MI, TH.
- G3 J, MI, TA.

Form of activity

- ...-PX ...according to projectwork X.
- GG Teacher-led presentation/review.
- TS Theory studies.
- OR Working on tasks.
- ØR Working on exercises.
- GR Group formation.
- OA Task delimitation.
- OF Task formulation.
- TL Organisation.
- DB Data processing.
- PA-U Project work – Performing.
- EV Assessment.
- PE Process evaluation.
- AN Other.

Focus areas

- KM-GE Modeling competency in general.
- KM-MO Modeling – motivation.
- KM-SY Modeling – systematisation.
- KM-MS Modeling – mathematisation.
- KM-DB Modeling – data processing.
- KM-MA Modeling – mathematical analysis.
- KM-TR Modeling – interpretation of results.
- KM-VV Modeling – assessment of validity.

- KP-MS Problem solving – mathematisation.
- KP-I Problem solving – internal.

- KR-GE Reasoning competency in general.
- KR-P Reasoning – focus on premises.
- KR-A Reasoning – focus on arguments.
- KR-K Reasoning – focus on conclusions.

- KS-GE Symbol handling competency in general.
- KS-A Symbol handling – decoding.
- KS-O Symbol handling – translation.
- KS-M Symbol handling – manipulation.

- KT Math. thinking competency.

- P-L Process management – Teacher init. attention.
- P-E Process management – Student init. attention.
- K-L Competency descript. – Teacher init. attention.
- K-E Competency descript. – Student init. attention.
- F-E Emotions and perceptions – student guidance frustration of the type “I do *not* know where I am going, and therefore I cannot get started”.
- F-P Emotions and perceptions – problem solving frustrations of the type “I know where I am going, but not how to get there”.
- M-L Metacogn. and control – Teacher init. attention.
- M-E Metacogn. and control – Student init. attention.
- H-L Heuristics – Teacher init. attention.
- H-E Heuristics – Student init. attention.