THE FIRST ACADEMIC YEAR – STEPS ON THE WAY TO MATHEMATICS

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To enable students who are becoming math teachers to provide a process related image of their subject in the future, they need to be made familiar with the subject's methods and – probably even more vital – they need a positive attitude towards mathematics. To this end, a program for the first academic year consisting of several measures, each of them complementary to the others, has been designed at the University of Hildesheim. Studies have been and will be conducted to evaluate the accomplishment of our goal. In this poster the program is presented and discussed.

STARTING SITUATION

Over the past decades there has been growing complaint about increasing problems of first year math students, including larger gaps between school and university with regard to subject-specific skills. Consequently, questions of supporting academic starters have become topic of research within the last few years (proceedings of conference about courses for mathematic newcomers are to be released soon, [3]). For beginners studying mathematics to become school teachers, additional aspects occur, there is on the one hand lack of motivation to do university math whilst on the other there are specific needs for this group of students. German curricula include the teaching of process related competencies such as problem solving, presenting and mathematical communication (as laid down in [4] and [5]), thus students aiming for being a teacher e.g. need to acquire the ability to communicate mathematics on very different levels. Further information on subject-specific requirements for math teachers can be found in [1] and [2].

INTRODUCTION OF THE PROGRAM

Within the frame of the new approach to the first academic year for those studying mathematics to become a teacher for primary or secondary school at the University of Hildesheim, modules were developed in order to help the students in being more successful and gaining a clearer view of their subject during their first two semesters. These should support math students taking their first steps at university towards subject-specific methods.

A preliminary two-week course focussed on repeating fundamental basics of school mathematics and a scholastic assessment test before the beginning of academic studies are the first two steps on the way, being in evaluation phase. The third module is a weekly "tutorial-market" during the first semester, which gives students the

opportunity for self-reliant group work on mathematical tasks and problems with assistance from lecturers and tutors if necessary. Within this arrangement students will be given the opportunity to communicate about mathematical contents and methods of problem solving. The fourth step, which is one having already been evaluated ([6]), is a joint three-day study trip ("Mathe-Hütte") in the second semester where students work independently and literature-based in small groups on a mathematical subject. On the third day they present their findings to the other participants in the course of a poster session, thus getting an opportunity to communicate and present mathematical contents to others – skills particularly crucial for a school teacher. In order to support students assessing their own proficiency and approach towards mathematics after the first stage of their studies, there is a fifth and final step: a mathematical talk in which lecturers and students meet to discuss the students' abilities and attitudes. This talk completes the first academic year.

PERSPECTIVE

Besides study [6], which was already completed, further research has been initiated to evaluate the program with respect to the goal formulated in the introduction. Particular questions are whether the program helps to bridge the gap between school and university math and if it increases the teacher-specific skills in mathematics.

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