Karsten Schmidt and Ulrik Engelund Pedersen, DTU Compute

Title:
Möbius Assessment for both simple and more advanced purposes

Abstract:
We present our experiences from six years of intense use of Möbius Assessment (MA, earlier known as Maple T.A.) at DTU's Mathematics 1, a large 20 ECTS-point course with a yearly intake of around 1500 students. The course has a wide range of teaching elements that together try to represent all eight mathematical competencies in "the mathematics competence circle" [1] and accordingly a wide range of assessment types. From the first version of the course in 2001 the CAS system Maple has been an important and effective tool in all elements of the teaching, learning and exam. On the other hand, the use of CAS tools has been widely criticized to disrupt the construction of elementary mathematical skills [2]. Our first use of MA had as one of its main goals to counter this criticism by putting each week's canonical skills on the agenda. Since then, we have expanded the use of MA to more complex and open assignment types (homework assignments), in the evaluation of project-based work (theme exercises) and in online home-exams (during covid-19). Unlike other experiments with the use of digital assessment on introductory mathematics teaching [3], the students' work with MA is part of the scheduled teaching, and we claim that we have thereby been able to reduce the problems that have been reported from other experiments with the program (superficial learning and cheating) [4]. Linked to this, the MA at Mathematics 1 is part of the higher course goals such as strengthening physical attendance at classes without TAs and facilitating group work and learning by pears. Our presentation includes a presentation of the overall course design, a detailed review of the assignment types used in the various course elements and conclusions from a current survey on the students' use and evaluation of MA.

[1] M. Niss et al: The Kom report, 2002
[2] https://www.uvm.dk/aktuelt/nyheder/uvm/2022/sep/220921-ekspertgruppe-er-klar-med-anbefalinger-til-at-styrke-matematikfaget
[3] F. Feudal and A. Unger: Students' Strategic Usage of Formative Quizzes in an Undergraduate Course in Abstract Algebra, 2022
[4] F. Rønning: Influence of computer-aided assessment on ways of working with mathematics, 2017