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Some major problems in the mathematics curriculum for secondary education. (Knelpunten en toekomstmogelijkheden voor de wiskunde in het VO.)

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In this article some major problems in the mathematics curriculum for secondary education are identified, specially in the traditional fields of algebra and geometry. One problem concerns the average level of algebraic competence in upper secondary school that is too low for the demands of subjects like calculus; this is a.o. a consequence of recent changes in the curriculum in junior highschool. Mere adding of more exercises in junior highschool is not seen as a solution, but a change of focus from too much attention on 'realistic graphs' to the study of interesting number relations and their visualisation could be worth to explore. It is a natural way to strengthen the basic concept of variables and the more formal handling of expressions at the same time. In this way exercises become connected with problem situations and are less prone to deterioration into meaningless dull manipulation. Other problems concern the geometry curriculum. The geometry curriculum in the Netherlands takes the exploration of natural space as a starting point. It is generally felt that this part of the curriculum works well for the average and below-average students, but also that the approach is not provoking enough for the more able ones. Only at the end of secondary education is there room for the study of formal proof, and currently only for a small minority of students. The latter is recently explored. This is a recent curriculum change and as could be expected, opinions about it differ. Students concerned like to explore the beauty of traditional Euclidian geometry in the combination with modern applications like Voronoi-diagrams, but currently there is due to the (now completely defunct) wave to the New Math a lack of didactical tradition in this field and some teachers find things quite hard. In this article the authors argue for the use of more demanding realistic and formal geometric problems for the more able students in junior highschool, for the further strengthening of the use of computerprograms like Cabri in both junior and senior highschool and for the use of modern advanced applications of geometry in senior high school. Also a better connection between the geometric and algebraic part of the curriculum could be an improvement for both, based on their point of departure that mathematics is a continuing process of reflection which is to be learned by the students in a situation where arguing and listening are important activities, the authors conclude with a warning against the current trend to diminish the available time for teacher-student interaction and the shift to the so called 'studiehuis' where students are forced to work too much on their own.

Classification: D34

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