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Posing mathematical problems: an exploratory study.

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Es wird über eine Untersuchung mit Lehrern und Lehramtskandidaten berichtet, bei der die Mathematikaufgaben formulieren sollten. Dabei wurde in einer Problemlöseumgebung gearbeitet, in der von den Probanden selbst ein entsprechendes Problem vorher, nachher oder zeitgleich zum eigenen Stellen von Aufgaben bearbeitet wurde. Ein Ziel war es, Unterschiede in der Formulierung der Aufgaben zu entdecken, je nachdem ob diese vor oder während bzw. nach der Lösung einer Problemaufgabe durch die Lehrer geleistet wurde. Es zeigte sich unter anderem, daß ein großer Anteil der Aufgaben in Cluster verwandter Probleme eingeordnet werden konnte. Dadurch wurde deutlich, daß Aufgaben häufig systematisch generiert wurden.

In this study, 53 middle school teachers and 28 prospective secondary school teachers worked either individually or in pairs to pose mathematical problems associated with a reasonably complex task setting, before and during or after attempting to solve a problem within that task setting. Written responses were examined to determine the kinds of problems posed in the task setting, to make inferences about cognitive processes used to generate the problems, and to examine differences between problems posed prior to solving the problem and those posed during or after solving. Although some responses were ill-posed or poorly stated problems, subjects generated a large number of reasonable problems during both problem-posing phases, thereby suggesting that these teachers and prospective teachers had some personal capacity for mathematical problem posing. Subjects posed problems using both affirming and negating processes; that is, not only by generating goal statements while keeping problem constraints fixed but also by manipulating the task's implicit assumption and initial conditions. A sizable portion of the posed problems were produced in clusters of related problems, thereby suggesting systematic problem generation. Subjects posed more problems before problem solving than during or after problem solving, and they tended to shift the focus of their posing between posing phases based at least in part on the intervening problem-solving experience. Moreover, the posed problems were not always ones that subjects could solve, nor were they always problems with "nice" mathematical solutions. (orig.)

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