

STUDIES ON THE QUALITY OF SCHOOL: ACQUISITION OF CONTENT SPECIFIC AND  
CROSS-CURRICULAR COMPETENCIES IN MATHEMATICS AND SCIENCE DEPENDING ON IN-  
SCHOOL AND OUT-OF-SCHOOL CONTEXTS

Kristina Reiss\*, Manfred Prenzel, Susanne Koerber

Institute for Science Education (IPN) at the University of Kiel, Germany

\*University of Oldenburg, Germany

Research on teaching and learning as well as the results of TIMSS have revealed that content specific and cross curricular competencies students acquire in German mathematics and science instruction are rather insufficient. Among the most prevalent deficits are 1) a lack of flexible application of knowledge in new situations, 2) difficulties in solving complex problems, and 3) the decline of interest in mathematics and science during high school. It is obvious that these deficits not only concern subject specific achievement but also motivational variables and key qualifications relevant for the efficient acquisition of new knowledge in general (e.g. problem solving strategies, the competence for self-regulatory learning). As a response to these findings a priority program "*Studies on the Quality of School...*" was launched by the Deutsche Forschungsgemeinschaft (DFG) in 2000. The program aims at systematically identifying reasons for this unsatisfactory performance and at suggesting theoretically and empirically well grounded interventions to improve the quality of education in German schools with a particular focus on mathematics performance as well as on science, motivational variables and cross-curricular competencies.

One important but often neglected factor influencing the quality of instruction is the general pattern of the lessons, called scripts. It is eminent to find out, whether there exist consistent, presumably culture specific, patterns of instruction, which patterns dominate, and how they interact with and influence learning processes. Another focus concerns certain components of instruction, like the use of representations or instructional methods and media and their interplay. Apart from the actual learning context (the learning situation), also the wider context of learning has to be considered. Teaching and learning science and mathematics are embedded in a particular school context and are influenced by it. And finally, there is the broad context of the society schools are part of. Students' views of what mathematics and science learning is about and whether it is worth the effort rests also on the attitudes and beliefs of teachers, parents and the peers.

Currently, there are 23 projects working in this program. In most of them mathematics and science educators and psychologists co-operate closely. Co-operation between the individual projects is a further key feature of the program. The projects are problem oriented, i.e., educationally relevant basic research and applied research are combined. The poster presented will provide an overview of the philosophy of the program and the 23 projects funded during the first two year period.