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Teacher perceptions of the characteristics of the materials and their use appeared not to be completely parallel to the students' perceptions and their writing achievements, measured in the effect study.

COURSEWARE CHARACTERISTICS AND THE TEACHER

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In the 'Computer-assisted lab work project' the computer has been used as a tool for collecting and displaying data during students' lab work. The courseware, a comprehensive set of laboratory exercises on 'Heat and Temperature', a student-textbook and a teacher guide, intended to improve students' inquiry skills, particularly interpreting graphs and drawing conclusions. The courseware promoted hands-on learning experiences. It was supposed that most teachers participating in the project were not used to hands-on learning. So the teacher guide paid special attention to recommendations for coaching students while learning by experience.

Goodlad et al. (1979) proposed a typology for different manifestations of the curriculum: ideal, formal, perceived, operational and experiential. In the symposium characteristics of the courseware (the formal curriculum) which positively or negatively influence the desired planning and coaching behaviour of teachers (considered critical in the operational curriculum) will be highlighted. To describe the implementation of the courseware a case study approach has been used. The cases in the study were five teachers, teaching in six lower secondary science classes (two schools, three classes per school). All lessons (N = about 60) with the courseware were audiotaped and observed, teacher-student interactions could therefore be carefully registered. A structured interview with the teachers about their perception of the courseware goals, about lesson preparation and execution and about effects on students, took place after all lessons were executed.

To analyze the observed lessons a so called 'curriculum profile' (Van den Akker, 1988) has been developed and validated by experts. In the curriculum profile the essential lesson elements were described in operational terms, with a differentiation between 'threshold', 'ideal' and 'unacceptable' elements. Information about the exact amount of time spent to each lesson and about technical problems with hard- and/or software could be derived from the lesson observations.

At this moment data-analysis is still in progress thus the final results are not yet available. Results about the following issues can be expected: (a) which characteristics of the courseware promote or inhibit the desired teaching and coaching behaviour; (b) do teachers change their teaching and coaching behaviour during the execution of the courseware; (c) for what reasons teachers show or don't show the desired teaching behaviour; (d) if and in what way side effects threaten the implementation process.

The findings of the study will be related to literature about implementation and courseware characteristics.

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