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exist at different system levels. An identification of these discrepancies may in itself be an important starting point for improvement measures in education.

Three populations were defined. Population I are the final grades of elementary education. Population II is lower secondary education and Population III is upper secondary education. Representative stratified random samples of schools and teachers in schools were drawn for each country. A distinction was made between schools using and not using computers.

In stage 1, altogether, by means of questionnaires data were collected from about 70.000 respondents (principals, computer coordinators and teachers) from schools sampled in 21 educational systems.

Countries participating in stage 1
The following countries (educational systems) are participating in the study: Austria, Belgium (Flemish),Belgium (French), China, Israel, Italy, Canada (British Columbia), Japan, Luxembourg, France, F.R. Germany, Greece, Hungary, India, Netherlands, New Zealand, Poland, Portugal, Spain, Switzerland, USA.

Instruments for stage 1
National policy data were collected with a questionnaire which addressed issues like national policies, for example with respect to hardware provision, courseware development, teacher training, budgets, innovation strategy, etc.

A Principal and a Computer Coordinator Questionnaire addressed issues like school policies in using computers, availability and acquisition of hard- and software, organization of computer use on school level, support, equity, attitudes and school characteristics.

Questionnaires for teachers of Computer Education, Mathematics, Science and Mother Tongue contained questions about computer education, types of computer use, frequency of use, time spenditure, curriculum content covered, attitudes, teacher knowledge and skills, and teacher training.

Instruments for stage 2
In stage 2, the same instruments will be used as in stage 1. In addition instruments have been developed to measure functional information technology abilities, attitudes and computer experiences of students. The pilot testing of these instruments took place in 1991 in 10 countries, whereas the main run data collection will take place in Spring 1992.

POLICY IMPLICATIONS FROM THE IEA SURVEY COMPUTERS IN EDUCATION
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In order to determine which information needed to be collected in this study, a framework was developed which identified the key factors at which the study was aimed. The framework consists of concepts derived from systems theory,

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curriculum theory and theories on educational change, as discussed in the previous section.

An educational system is a complex of subsystems at different levels: at the macro level the educational system of a country or state, at the meso level the school, and at the micro level the classroom and the student. On each level, educational decisions are influenced by different actors; for example, at the school level the school board, the principal, the subject matter department, and the teacher. External influences may be exerted by, for example, business and industry, or parents. The output of a subsystem at a certain level can be conceived as the input for the subsystem on the next level. For example, the output at the macro level may consist of policies, intentions and plans of governments, laid down in official documents, or existing as shared conceptions of what is expected from schools. Conceiving this as the input for schools, the output at this level consists of the activities and the practices in the classrooms, the time allocations and the instructional practices with computers of teachers. This is the input at the micro level, resulting in activities, cognitive skills and attitudes of students.

In curriculum theories, a distinction is made between the intended, implemented and attained curriculum. The intended curriculum refers to the curriculum plans (at the macro level), which may be laid down in official documents or which may exist as shared conceptions of what the important curriculum content is. The implemented curriculum (at the meso level) consists of the content, time allocations, instructional strategies, etc. which the teacher is actually realizing in his/her lessons. The attained curriculum (at the micro level) is defined as the cognitive skills and attitudes of students as a result of teaching and learning.

Taking these three curriculum levels as major input/output categories one may wonder how these levels influence each other and which factors may explain the occurrence of discrepancies. The literature on educational change may be used for tracing potential factors (e.g. Fullan, Miles, & Anderson, 1988). These factors include the quality, clarity and relevance of the objectives and the characteristics of the innovation (content, materials, instructional strategies); support and leadership; staff development; experiences with innovations; and the existence of evaluation and feedback.

This study incorporates the three different perspectives which are described above. The global conceptual framework for the study, in which the three perspectives are related to each other, will be presented in the article as an introduction to the other articles. Moreover, a description of results on the key factors will be provided. Furthermore the policy implications resulting from the results presented in the other articles in this symposium will be summarized.