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**Cover:**

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## **SOME RESULTS FROM IEA'S STUDY 'COMPUTERS IN EDUCATION'**

***Tjeerd Plomp, Department of Education, University of Twente, Enschede, The Netherlands***

### **Introduction**

Many countries have adopted policies for the systematic introduction of computers in education. The major goal of the Computers in Education study (Comped) of the International Association for the Evaluation of Educational Achievement (IEA) is to collect longitudinal and cross-national comparative data in order to contribute to the evaluation of policies on (the introduction of) computers in the countries that are participating in the project and to building a knowledge base from which answers to questions about what and how to use computers in education can be sought.

This symposium will focus on who participated in this study and on the results in a few countries.

### **Goals and design of the study**

The major goals of the study are to describe and analyze crossnationally as well as longitudinally how computers are used in schools by teachers and students, and what cognition, skills and attitudes students have with respect to new information technologies.

The study consists of two stages. During stage 1 (1987-1990) data were collected in elementary, lower secondary and upper secondary schools at school and teacher level. In stage 2 (1991-1994) measures from stage 1 will be repeated and, in addition measures at student level will be taken.

The measures taken in stage 1 of the study were based on a conceptual framework characterizing the educational system in terms of levels of decision-making and identifying the factors contributing to effect changes. These factors were taken from literature on educational change (e.g.: Fullan, Miles, & Anderson, 1988) such as 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 innovation; and the existence of evaluation and feedback. The framework reflects the hierarchical structure of most educational systems, but acknowledges that decisions which promote or inhibit the implementation of computer-related curricula are made at all levels, which may cause discrepancies between decisions and expectations that

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 expenditure, 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**

***Willem J. Pelgrum and Tjeerd Plomp, University of Twente-  
OCTO, Enschede, The Netherlands***

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,