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What examples are there of what we consider results in mathematics education to be? What do we know today that we did not know before? What have we learned about the processes of learning and teaching? What do we know about mathematics that mathematicians were not aware of before?

Can we identify some categories of results? One category might be *economizers* of thought. Any facts, laws, methods, procedures, or theories that are general enough to direct our experience and predict its results will give us increased power over our teaching and learning. Another category might be *demolishers of illusions*. Results that undermine our beliefs and assumptions are always valuable contributions to the field. A third category might be *energizers of practice*. Teachers welcome research that helps them understand what they teach and provides them with ideas for teaching. The development of teaching materials, activities, and challenging problems belongs to this category. Other categories of results might emerge from epistemological, methodological, historical, and philosophical studies.

5. WHAT CRITERIA SHOULD BE USED TO EVALUATE THE RESULTS OF RESEARCH IN MATHEMATICS EDUCATION?

How do we assess the validity of research findings? How do we assess their worth? Should we use the criterion of relevance? What about objectivity? Or originality? Should we consider the influence research has had on the practice of teaching? What other criteria should we use?

The first problem is to clarify the meaning of terms such as *truth*, *validity*, and *relevance* in the context of mathematics education. A related issue is the question of what is knowledge as such. This is an even more fundamental question than that of validation. If we knew what kind of knowledge mathematics education aims at, we would be better equipped for answering the question of methods of validation.

It is also useful to understand the ways in which research results are used. How have the results of research in mathematics education been applied? How do teachers use the research? How do policy makers use it? By clarifying the uses to which research is put, can we develop better criteria for assessing its validity?

CALL FOR PAPERS

An ICMI Study on "What is Research in Mathematics Education, and What are Its Results?" will investigate the questions above, as well as others raised by various contributors, over the next year or so. The study will have two components: an invited *study conference* and a *publication* to appear in

the ICMI Study series that will be based on contributions to and outcomes of the conference. The conference will be held in the spring of 1994 at a site to be determined (two possibilities are Japan and the USA), and the major outcomes of the study will be presented at the International Congress of Mathematicians in Zürich the following summer.

The International Program Committee (IPC) for the study invites readers to submit papers on specific problems or issues stimulated by this discussion document no later than **1 September 1993**. Contributors may wish to address either questions raised in the document or questions that arise in response to it.

Papers, as well as suggestions regarding the content of the study and the conference program, should be sent to *both* co-chairs of the IPC:

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The secretary of ICMI, Mogens NISS, Roskilde University, Denmark, is a member *ex officio*.

(The above quotations from Nicolas Balacheff and Geoffrey Howson stem from the exchange of views during the preparation of this Discussion Document.)

(Reçu le 15 janvier 1993)