



Assessing the quality of research in mathematics education

(A text prepared by the ICMI Executive Committee)

Background

All over the world, there is an increasing tendency to rely on numbers, such as impact factors and citation indices, for assessing the quality of scientific research. In many instances, those responsible for the recruitment and promotion of researchers find such “measures” easy to use even if they are completely ignorant of the scientific field in question. Additionally these measures are frequently accorded as much or even more influence than the traditional evaluations of experts in the field.

Aware of the importance today for a scientific journal to be included in scientific indexes, the editorial board of Educational Studies in Mathematics (ESM) applied for inclusion in the SSCI (Social Sciences Citation Index) of ISI Thompson, the index most widely in use. Educational Studies in Mathematics is widely recognised by the international mathematics education community as one of the major international journals in the field, if not the premier journal. Its influence has been growing year by year. Nonetheless application was not successful largely because the citation level for ESM, as computed by ISI algorithms, was too low.

At the time of this first ESM application, the previous Executive Committee (EC) of the International Committee for Mathematics Instruction (ICMI) was approached by the chief editor of ESM for support, partly because of historical links between ESM and ICMI ; ESM was founded in 1968 by Hans Freudenthal, ICMI President from 1967 to 1970. The past ICMI EC looked into the situation and, while fully agreeing with the necessity of a scientific evaluation of research in mathematics education, considered that assessment of research through ISI Thompson is unsatisfactory. Moreover the EC considered that if the practice continued, there was likely to be damaging effects on future research and as a consequence, on mathematics education itself. As a consequence, after the ICMI EC meeting in November 2006, Hyman Bass and Michèle Artigue sent a letter to ISI Thompson expressing these concerns, but with no positive outcome.

We note that the ISI citation index includes many journals in the field of education, but only one in mathematics education: the Journal for Research in Mathematics Education (JRME), which was included in the index a long time ago. Even this journal has a rather low impact factor in ISI if compared to journals that do not focus on a specific discipline. This fact is easily understandable since the ISI computation of citation level considers the citations in journals of the SSCI itself. Thus the under-representation of mathematics education also affects JRME.

Faced with this situation, the editorial board of ESM decided to collect and analyse data, which in their view was a more accurate measure of the respective impact of the different journals in the field. It first compared the respective references to JRME and ESM, in the recent proceedings of the Conferences of the Affiliated Study Group of ICMI devoted to research in mathematics education, the International Group for the Psychology of Mathematics Education (PME). It then extended the study to the main journals in the field. The results are clear. JRME and ESM are, in terms of citations, by far the major journals in the field, and including one and not the other in an index does not make sense from a scientific point of view. One might even consider that ESM has a broader international coverage than JRME.

The present situation

The current ICMI EC is fully supportive of the position taken by the previous ICMI EC with respect to the position of ESM in the SSCI. The Committee feels that it is obliged to draw to the attention of those in charge of the evaluation of research in mathematics education, the scientific bias in the current situation. The EC of ICMI is in no doubt that the SSCI of ISI Thompson cannot be considered as an appropriate means for appreciating and assessing the quality of research in mathematics education.

Because of the potentially harmful effects on our field of the use of this metric, the ICMI EC is more than willing to collaborate with ISI or other agencies in their efforts to achieve an improved representation and evaluation of research in mathematics education. At the ICMI EC meeting in June 2007, it was decided to set up a subcommittee specifically for this purpose, to include as members, the past ICMI President, Hyman Bass, the current President Michèle Artigue, the vice-President Jill Adler and Celia Hoyles.

As a first step this subcommittee would like to point out that, even if it is the most used, the SSCI is not the only reference list in use today. The European Science Foundation, for instance, has recently created in the European Reference Index for the Humanities (ERIH), a list for journals on Pedagogical and Educational Research, which has the aim of helping to identify excellence in Humanities scholarship. Some 470 journals are included in this list, which is classified into three categories: A, B and C. A is for high-ranking international publications with very strong reputation among researchers of the field in different countries and regularly cited all over the world (currently 85 journals representing 18% of the whole list); B is for standard international publications with good reputation in different countries; and C is for good scientific journals whose influence is considered more local or regional in Europe, and, in contrast to the other categories, only includes European publications. We would like to draw to your attention that in ERIH, 9 journals include mathematics in their title, one, ESM is listed in category A, six in category B (including JRME), and two in category C. It is our judgement that the representation of research in mathematics education journals is better in ERIH than in SSCI, although it too might be improved.

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