Nuffield Seminar Series on Mathematical Knowledge in Teaching

Seminar 2, 18th April 2007, Manchester University, School of Education (Devas Street)

Mathematical knowledge in teaching about fractions

This seminar will discuss the following three studies of mathematical knowledge in teaching about fractions:

1.Chaper 3 [and the short methodological introduction] of Ma, L. (1999) *Knowing and teaching mathematics: teachers' understanding of fundamental mathematics in China and the United States*. Mahwah, NJ: Lawrence Erlbaum.

2. An, S., Kulm, G., & Wu, J. (2004). The Pedagogical Content Knowledge of Middle School Mathematics Teachers in China and the U.S. *Journal of Mathematics Teacher Education* 7(2), 145-172.

3. Borko, H., Eisenhart, M., Brown, C. A., Underhill R. G., Jones, D. & Agard P. C. (1992). Learning to teach hard mathematics: Do novice teachers and their instructors give up too easily? *Journal for Research in Mathematics Education* 23 (3) 194-222.

[A selection of additional, related papers is listed below]

The timetable will be as follows:

10.30-11.00 Arrivals and coffee [Room AG3]

11.00-11.15 Introduction to the seminar (Tim Rowland)

11.15-12.15 Plenary discussion of Paper 1: Ma. Introduced* by Dolores Corcoran and Johannes Siemons. [AG3]

12.15-13.15 Plenary discussion of Paper 2: An *et al.* Introduced* by Lara Alcock and Ray Huntley. [AG3]

13.15-14.00 Lunch

14.00-15.00 Plenary discussion of Paper 3: Borko *et al.* Introduced* by Peter Huckstep and Sandy Peperell. [AG3]

15.00-15.45 Group discussion relating all three papers to seminar series themes.

- Group 1: Theme – conceptualising and theorising mathematical knowledge for teaching. [AG3].
- Group 2: Theme - auditing and assessing such knowledge [AG9]
- Group 3: Theme - developing and deepening such knowledge [AG11]

15.45-16.30 Plenary discussion relating all three papers to seminar series themes, introduced* by brief remarks from the Groups 1, 2, 3.

16.30-16.45 Future plans

*Short written versions of these introductory remarks will be made available on the seminar website after the meeting.

Related Papers

Ball, D. L. (1990) Prospective Elementary and Secondary Teachers' Understanding of Division. *Journal for Research in Mathematics Education* 21 (2) 132-144.

Lehrer, R. and Franke, M. L. (1992). Applying Personal Construct Psychology to the Study of Teachers' Knowledge of Fractions. *Journal for Research in Mathematics*

Leinhardt, G. (1989) Math Lessons: A Contrast of Novice and Expert Competence *Journal for Research in Mathematics Education* 20 (1) 52-75.

Steinbring, H. (1998). Elements of Epistemological Knowledge for Mathematics Teachers. *Journal of Mathematics Teacher Education* 1(2): 157-189.

Tirosh, D. (2000). Enhancing Prospective Teachers' Knowledge of Children's Conceptions: the Case of Division of Fractions. *Journal for Research in Mathematics Education.* 31 (1) 5-25.