

IMAGERY AND VISUALIZATION WITHIN PRE-SCHOOL AND ELEMENTARY NUMBER: A 2-YEAR CASE STUDY OF 11 SCHOOLS

Adrian J Pinel

University College Chichester

Jenifer M Pinel

Freelance Researcher

For two school years from Autumn 1998, 11 schools teaching 4-9 year old students adopted and pursued a number curriculum with a strong emphasis on progressively building imagery and visualization. Both authors studied this by visiting the schools, discussing developments with teachers, and observing lessons.

Research questions identified were:

- will the initial commitment of teachers to the more visual curriculum be sustained? (1. we assert that there is not a culture of persistence in English elementary education; 2. the 2-year period included, from Autumn 1999, the introduction of the English *National Numeracy Strategy*);
- will the students show themselves as in a different relationship to numbers – e.g. as having a greater ‘at-homeness’ with numbers – after 1 year, after 2 years of the visual curriculum;
- will the students’ achievements with numbers be enhanced: *specifically* their number location, ordering, counting, complement-finding, calculating and calculation-adjustment abilities.

The oral presentation will:

- identify key features of the responses of teachers and their students, including gains in ‘at-homeness’ with numbers;
- illustrate these with respect to *one* of the teachers and her class;
- present evidence of increased abilities to use imagery and to visualize when dealing with number problems;
- present evidence of increased achievement levels within the aspects specified above;
- outline how these schools reacted to the English *National Numeracy Strategy*;
- relate this study to the ideas of Freudenthal, Gattegno, Wittmann and others.

Klein A S (1998) *Flexibilization of Mental Arithmetic Strategies on a Different Knowledge Base*. Freudenthal Institute

Selter C (1997) Instructional Design for Teacher Education. In M Beishuizen, K Gravemeijer, E van Lieshout (eds.) *The Role of Contexts & Models in the Development of Mathematical Strategies & Procedures*. Freudenthal Institute, 55-77

Treffers A (1991) Didactical Background of a Mathematics Program for Primary Education. In *Realistic Mathematics Education in Primary School*, L Streefland (ed.) Freudenthal Institute

Wittmann E Ch (1998) Standard Number Representations in the Teaching of Arithmetic, Journal fuer Mathematik-Didaktik **19** (2/3) 149-178