Celia Hoyles BSc Hons, PGCE MEd, PhD **(http://www.ioe.ac.uk/people/CeliaHoyles)**

Summary of qualifications & employment: I studied honours mathematics at the University of Manchester where I was awarded the top first for my year and the Dalton Prize for Science(1967). I was a teacher in London schools, then a lecturer in the Polytechnic of North London, during which time I earned a masters in mathematics education (with distinction, 1973) and doctorate, 1980. I have been a Professor of Mathematics Education at the Institute of Education, University of London since 1984 (Dean of Research 2002-2004). I was a member of the International Study Group BACOMET 1985-94 and was director of the Group 1991-3.I co-presented a series of popular TV programmes (1987-90) aiming to raise the profile of mathematics (with more than 10 million viewers). Since then I have directed over a dozen research projects concerned with mathematics at all levels and in a variety of contexts. I have been an editor for the *International Journal of Computers for Mathematical Learning*, and book review editor for *Educational Studies in Mathematics.*
In Dec 2004 I took up the position of the UK Government's Chief Adviser for Mathematics, a post to which I am seconded for 75% of my time. I am co-Chair of a forthcoming ICMI Study on the use of digital technologies in Mathematics Education, with the Study Conference to be held in Vietnam in Dec 2006.

Major research interests: My early research involved the study of students' affective responses to learning mathematics. This was followed by research with Logo and other computer applications and analysis of group interactions with and around computers. My ongoing research concerns students' developing mathematical reasoning and conceptions of proof in secondary school mathematics, the mathematical skills used and needed in various sectors in the workplace and the use of computers in teaching and learning mathematics.

Keynote speeches*:* I have spoken at most of the major international conferences in the field (e.g. International Logo conference, MIT, 1985, PME in 1988, ICME subplenaries, 1992 & 2004, BCME (British Congress of Mathematics Education) 2005. I have presented at AERA, EARLI and given research seminars at many universities across the world (e.g. MIT Media Lab, Universities of Hong Kong, Auckland, Taiwan, Stanford and California at Berkeley and in different places in Brazil and Mexico). I presented my work on proof at the *International Congress of Mathematicians* in Beijing, Aug 2002. I delivered at the University of Oxford one of the six presentations in the series *The Herbert Spencer Lectures*, 2002 on the future of education.

Research Committees & policy work: I have served on the UK ESRC *Research Grants Board,1994-1999,* (the major funding agency for research in Education, in U.K.) and advised the *National Science Foundation* in US on research proposals in mathematics and science, 2000. I was elected *Chair of the Joint Mathematical Council of the U.K.* and served 1999-2003 and was a founding member of the *Advisory Committee on Mathematics Education* that speaks for the whole of the mathematics community (including mathematicians, teachers and mathematics educators) to Government on policy matters. In 2002, I played a major role in ACME's first report to Government on the *Continuing Professional Development of Teachers of Mathematics*. ACME's proposals were accepted for funding by the Secretary of State for Education, Charles Clarke in March 2003 and a national programme will be put in place from April 2006.

Honours: In May 2003, I was elected as a Fellow of the Institute of Mathematics and its Applications. In January 2004, I was awarded an OBE (Officer of the British Empire) in the New Year's Honours list for Great Britain and the Commonwealth Britain for services to mathematics education. Also in 2004, I was chosen by ICMI as the first recipient of a new International medal, the Hans Freudenthal medal, as recognition of a cumulative programme of research. In 2006 I will be awarded an honorary doctorate by the Open University

Selected Books

Co-author: (1) *Windows on Mathematical Meanings: Learning Cultures and Computers*, Kluwer, (1996); (2) *A Comparative Study of Geometry Curricula.* QCA (2002).

Co-editor: (1) *Computers and Exploratory Learrning*, Springer-Verlag (1995); (2) *Rethinking the Mathematics Curriculum.* London: Falmer Press. (1998); (3) *Mathematical Skills in the Workplace* University of London/Science, Technology and Mathematics Council (2002)
(4) *Meaning in Mathematics Education,* Springer USA (2005),

Selected Research articles

Healy L & Hoyles, C. (2000), 'A Study of Proof conceptions in Algebra'. *Journal for Research in Mathematics Education*, 31, 4, 396-428.

Hoyles, C. and Noss, R. (2003) 'What can digital technologies take from and bring to research in mathematics education?' In A.J. Bishop,et.al (eds), *Second International Handbook of Mathematics Education*. Dordrecht: Kluwer Academic Publishers.

Hoyles, C. (2001), 'From describing to designing mathematical activity: the next step in developing a social approach to research in mathematics education'. *Educational Studies in Mathematics*, 46, 1-3, 273-286.

Hoyles, C., Noss, R. and Pozzi, S. (2001), 'Proportional Reasoning in Nursing Practice'. *Journal for Research in Mathematics Education*, 32, 1, 4-27.

Hoyles, C., Newman, K. and Noss, R. (2001), 'Changing Patterns of Transition from School to University Mathematics'. *International Journal of Mathematical Education in Science and Technology*, 32, 6, 829-845.

Healy, L. & Hoyles, C., (2001), 'Software Tools for Geometrical Problem Solving: Potentials and Pitfalls'. *International Journal of Computers for Mathematical Learning*, 6, 3, 235-256.

Hoyles, C. (2001), 'Steering Between Skills and Creativity: A Role for the Computer?'. *For the Learning of Mathematics*, 21, 1, 33-39.

Hoyles, C., Noss, R. and Adamson, R. (2002) 'Rethinking the Microworld Idea. *Journal of Educational Computing Research*, 27, 1&2, 29-53.

Noss, R., Hoyles, C., and Pozzi, S. (2002) 'Abstraction in Expertise: A Study of Nurses' Conceptions of Concentration'. *Journal for Research in Mathematics Education*, 33, 3, 204-229.

Hoyles, C. and Küchemann, D. (2002) 'Students' understandings of logical implication'. *Educational Studies in Mathematics*, 51, 3, 193-223.

Hoyles, C., Noss, R. and Kent, P. (2004), 'On the Integration of Digital Technologies into Mathematics Classrooms'. *International Journal for Computers in Mathematical Learning.*, 9, 3, 309-326

Simpson, G., Hoyles, C. & Noss, R. (2005) Designing a programming-based approach for modelling scientific phenomena *Journal of Computer Assisted Learning*, 21, pp143-158

Hoyles, C., Küchemann, D., Healy, L. and Yang, M. (2005), 'Students' Developing Knowledge in a Subject Discipline: Insights from combining Quantitative and Qualitative Methods'. *International Journal of Social Research Methodology*, Vol. 8, No.3 July, pp225-238

Recent Research projects; ***Director or Co-Director:*** Justifying and Proving in School Mathematics (ESRC, 1995-98); Towards a Mathematical Orientation through Computational Modelling (ESRC, 1995-98); Mathematics for the New Millennium (Nuffield Foundation, 1995-96); Longitudinal Study of Mathematics Reasoning (ESRC, 1999-2003); Animated Playgrounds for Learning (ESPRIT, EU, 1998-2001); International Comparative Study of Geometry Curricula (Qualifications & Curricula Authority, UK, 2001-2003); Mathematics Skills in the Workplace (STM, 2001-02); WebLabs new representational infrastructures for e-learning (EU, IST, 2001-03); Techno-mathematical Literacies in the Workplace (ESRC, 2003-06); Developing Research-Informed Materials in Mathematical Reasoning for Teachers (QCA/DfES, 2004-06) Professional Development for Teachers of Mathematics: a Pilot London Mathematics Centre (The Gatsby Charitable Foundation, 2004-06).