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Positions, awards and honors.

Full Professor of Didactics of Mathematics at the Faculty of Education of the Università di Modena e Reggio Emilia. Vice-dean of the Faculty. Director of the University Course for Primary School since 1998. Director of the University Science Museum from 2000 to 2003. Director of the Laboratory of Mathematical Machines (at the Department of Mathematics) since 2003. Curator of many public exhibitions (see <http://www.mmlab.unimore.it>) for the popularization of mathematics.

Member of the international group PME since 1991, vicepresident from 1993 to 1995. Member since 1992 of the international group BaCoMET).

Member of the editorial board of *Recherches en Didactique des Mathématiques*, *Educational Studies in Mathematics*, *Journal of Mathematics Teacher Education*, *European Mathematical Society Newsletter*.

Member of the IPC of ICME10 and of the ICMI Study n. 16 (Challenging Mathematics in and beyond the Classroom).

Plenary speaker (PME 1991; PME 1995; Portugal, 1997; The Netherlands, 1998, Norway, 1999; Canada, CMSG, Montreal 2000); invited speaker (ICME8, Sevilla; ICM98 Berlin). Teacher at the 1st ERME summer School (Klagenfurt, 2002). Teacher at the national Swedish doctoral school (Lulea, 2003). Invited participant at the ICMI Studies on Mathematics Education as a Research Domain: a Search for Identity; Perspectives on the Teaching of Geometry for the 21st Century; History in Mathematics Education.

Associate editor of the volumes : *Language and Communication in the Mathematics Classroom*; *Handbook of International Research in Mathematics Education* (the second edition of this Handbook is forthcoming).

Principal contractor of the project Maths Alive RPTN-1999-00025, funded by the European Commission (1999/2003).

Director of the project "Hands on Maths", shortlisted as one of the 6 finalists (the only one for mathematics) at the Altran award for innovation (2004): <http://www.fondation-altran.org>.¹

Director of the project "Perspectiva Artificialis", shortlisted at the 8th PIRELLIINTERNETional award (2004): <http://www.pirelliaward.com/>.

Director of the national research projects PRIN COFIN 2003 "Problems of teaching and learning in mathematics: meanings, models, theories" (2004-2005) and PRIN COFIN 2005 "Meanings, conjectures, proofs: from basic research in mathematics education to curricular implications" (2006-2007).

Current Research and Interests

I have actively worked for the constitution and the international acknowledgement of the paradigm of 'research for innovation', typical of many studies of the Italian research community; I have published studies on semiotic mediation, drawing on the seminal work of Vygotskij and relating this construct to cases of innovation with strong components of social interaction and the presence of artefacts. The elaboration of the theoretical construct of semiotic mediation is based on experiments, carried out together with teachers-researchers (all school grades), according to the paradigm of research for innovation. One of the most original features is the important role given to the teacher, as orchestrator of discussions. In the same time, research studies on special artefacts (of the ancient 'technologies') have been carried out. The focus has been mainly on geometrical instruments (e. g. curve drawing devices and perspectographs). They are now known as 'mathematical machines'. First they have been studied in secondary school and later in primary school too. The analysis of the teacher's role has been intertwined with the analysis of the artefacts and with the analysis of pupils' processes (study of embodiment, analysis of gestures and other semiotic means). The environment where the research studies are carried out now is the new Laboratory of Mathematical Machines, a big room in the Department of Mathematics where the rich collection of more than 200 copies of ancient instruments is stored. The activity of the Lab is known internationally with established long-standing cooperation with many groups in Europe and overseas (e.g. Hoyos in Mexico; Bellemain in Recife; Vincent in Australia; Sangaré in Mali, Isoda in Japan, Radford in Canada). The Lab has hosted the first IPC meeting of the Icmi Study n. 16 (Challenging Mathematics in and beyond the classroom), in November 2003.

Main References in the international literature follow (for a complete list see:
http://www.formazione.unimore.it/images/stories/cv/bartolinimaria_251005.pdf).

¹ The ICMI has supported this participation and judged this project "of particular interest to ICMI as it directly connects to initiatives of the Commission towards the needs of non-affluent countries in mathematics education".

BARTOLINI BUSSI M. G. & MASCHIETTO M. (in press), The Laboratory of mathematical machines of Modena, ICMI Bulletin.

BARTOLINI BUSSI M. G. (2005), Pruebas geométricas y máquinas matemáticas: Un estudio exploratorio in M. Falconi and V. Hoyos (eds.), INSTRUMENTOS Y MATEMÁTICAS: HISTORIA, FUNDAMENTOS Y PERSPECTIVAS EDUCATIVAS. España-México: Reverté-Fac. de Ciencias, UNAM. 2005.

BARTOLINI BUSSI M.G. (2005). When classroom situation is the unit of analysis: The potential impact on research in mathematics education. A Commentary Paper. EDUCATIONAL STUDIES IN MATHEMATICS. ISSN: 0013-1954 Volume 59 (1-3) pp. 299 – 311.

BARTOLINI BUSSI M.G. (2005). The Meaning of Conics: historical and didactical dimension. In HOYLES C.; KILPATRICK J.; SKOVSMOSE O. Meaning in Mathematics Education. Springer.

BARTOLINI BUSSI M.G., MARIOTTI M. A., FERRI F. (2005). SEMIOTIC MEDIATION IN THE PRIMARY SCHOOL: DÜRER'S GLASS. In HOFFMANN H.; LENHARD J.; SEEGER F. Activity and Sign - Grounding Mathematics Education (Festschrift for Michael Otte), New York: Springer

BARTOLINI BUSSI M.G. (2005). Del ábaco al ordenador: formación y práctica profesional del docente,. UNO. vol. 39 ISSN: 1133-9853 in press.

BARTOLINI BUSSI M.G., BAZZINI L. (2003). Research, practice and theory in didactics of mathematics: Towards dialogue between different fields. EDUCATIONAL STUDIES IN MATHEMATICS. vol. 54 (2-3) pp. 203-223 ISSN: 0013-1954

BARTOLINI BUSSI M.G., BONI M. (2003). Instruments for semiotic mediation in primary school classrooms. FOR THE LEARNING OF MATHEMATICS. vol. 23 (2) pp. 12-19 ISSN: 0228-0671

ARZARELLO F., BARTOLINI BUSSI M.G., ROBUTTI O. (2002). Time(s) in the Didactics of Mathematics: A Methodological Challenge. In ENGLISH L. D et al. see below.

ENGLISH L., JONES G., LESH R., TIROSH D., BARTOLINI BUSSI M.G. (2002). Future Issues and Directions in International Mathematics Education Research. In ENGLISH L. D et al. see below.

ENGLISH L. D., BARTOLINI BUSSI M.G., JONES G. A., LESH R. A., TIROSH D. (2002). Handbook of International Research in Mathematics Education. ISBN: 0-8058-3371-4 MAHAWAH, NEW JERSEY: Lawrence Erlbaum Associates, Publishers (UNITED STATES).

BARTOLINI BUSSI M.G. (2001). The Geometry of Drawing Instruments: Arguments for a didactical Use of Real and Virtual Copies,. CUBO. vol. 3 (2), pp. 27-54 ISSN: 0716-7776

BARTOLINI BUSSI M.G. (2000). Ancient Instruments in the Mathematics Classroom. In FAUVEL J.; VAN MAANEN J. History in Mathematics Education: The ICMI Study, (pp. 343-351). DORDRECHT: Kluwer Academic Publishers (NETHERLANDS).

BARTOLINI BUSSI M.G., SIERPINSKA A. (2000). The relevance of the Historical Studies in Designing and Analysing Classroom Activities. In FAUVEL J.; VAN MAANEN J. History in Mathematics Education: The ICMI Study (pp. 154-162). DORDRECHT: Kluwer Academic Publishers (NETHERLANDS).

BARTOLINI BUSSI M.G., BONI M., FERRI F., GARUTI R.. (1999). Early Approach to Theoretical Thinking: Gears in Primary School. EDUCATIONAL STUDIES IN MATHEMATICS. vol. 39 pp. 67-87 ISSN: 0013-1954

BARTOLINI BUSSI M.G., MARIOTTI M. A. (1999). Semiotic Mediation: from History to Mathematics Classroom. FOR THE LEARNING OF MATHEMATICS. vol. 19 (2) pp. 27-35 ISSN: 0228-0671

ARZARELLO F., BARTOLINI BUSSI M.G. (1998). Italian Trends in Research in Mathematics Education: A National Case Study in the International Perspective,. In KILPATRICK J.; SIERPINSKA A. Mathematics Education as a Research Domain : A Search for Identity (vol. 2 pp. 243-262). DORDRECHT: Kluwer Academic Publishers. (NETHERLANDS).

BARTOLINI BUSSI M.G. (1998). Drawing Instruments: Theories and Practices from History to Didactics. DOCUMENTA MATHEMATICA. vol. Extra Volume ICM98 pp. (3) 735-746 ISSN: 1431-0635

BARTOLINI BUSSI M.G. (1998). Joint Activity in the Mathematics Classroom: a Vygotskian Analysis. In SEEGER F.; VOIGT J. WASCHESHO U. The Culture of the Mathematics Classroom. Analyses and Changes (pp. 13-49). ISBN: 0-521-57107 CAMBRIDGE: Cambridge University Press (UNITED KINGDOM).

BARTOLINI BUSSI M.G. (1998). Verbal Interaction in Mathematics Classroom: a Vygotskian Analysis. In STEINBRING H.; BARTOLINI BUSSI M. G.; SIERPINSKA A. Language and Communication in the Mathematics Classroom (pp. 65-84). ISBN: 0-87353-441-7 RESTON, VA: NCTM (UNITED STATES).

BARTOLINI BUSSI M.G., BOERO P. (1998). Teaching Learning Geometry in Contexts. In MAMMANA C.; VILLANI V. Perspectives on the Teaching of Geometry for the XXI Century (pp. 52-61). DORDRECHT: Kluwer Academic Publishers (NETHERLANDS).

BARTOLINI BUSSI M.G., STEINBRING H., SIERPINSKA A. (1998). Language and Communication in the Mathematics Classroom. (pp. 351). ISBN: 0-87353-441-7 RESTON: NCTM (UNITED STATES).

BARTOLINI BUSSI M.G. (1996). Mathematical Discussion and Perspective Drawing in Primary School. EDUCATIONAL STUDIES IN MATHEMATICS. vol. 31 pp. 11-41 ISSN: 0013-1954

BARTOLINI BUSSI M.G., PERGOLA M. (1996). History in the Mathematics Classroom: Linkages and Kinematic Geometry. In JAHNKE H. N.; KNOCHE N.; OTTE M. Geschichte der Mathematik in der Lehre (pp. 36-67). ISBN: 3-525-40318-6 GOETTINGHEN: Vandenhoeck & Ruprecht (GERMANY).

BARTOLINI BUSSI M.G. (1994). Theoretical and Empirical Approaches To Classroom Interaction. In BIEHLER; SCHOLZ; STRASSER WINCKELMANN Didactics of Mathematics as a Scientific Discipline (pp. 121-132). DORDRECHT: Kluwer Academic Publishers (NETHERLANDS).