

Reading course on Introduction to mathematics education

(Credits: 2; Instructor: K. Subramaniam; Tutors: Rossi D'Souza, Shikha Takker, Shweta Naik)

The course aims to introduce the mathematics education as an area of research and inquiry through a set of readings. The readings given below are indicative and may change as the course evolves.

Unit 1: The nature and history of mathematics (KS)

Bunt, L.N.H., Jones, P.S., & Bedcent J.D. (1988). The historical roots of elementary mathematics. NY: Dover Publications. (1. Egyptian Mathematics, 2. Babylonian Mathematics 1.1). (17 pages)

Davis, P.J. and Hersh, R. (1999). The Mathematical Experience. (Chapters-Symbols, Abstraction, Generalization, Formalization, Mathematical objects, structures and existence, Proof 1.1) (16 pages)

Gowers, T. (2002) Mathematics – a very short introduction. OUP. Chapters 1, 2, (17 pages)

Ernest, P. (2000) 'Why teach mathematics?' In John White and Steve Bramall (eds.), Why learn Maths. London: London University Institute of Education

Unit 2: Fractions—Decimals and approaches to learning (ST)

Clements, D.H. & Sarama, J. (2009) Learning and Teaching Early Math: The Learning Trajectories Approach. Chapters 2 & 3. New York, Routledge.

Ernest, P. (1998) The nature of the mathematics classroom and the relations between personal and public knowledge: An epistemological perspective. In F. Seeger, J. Voigt and U. Waschescio (Eds.) The culture of mathematics classroom. UK: Cambridge University Press.

Nunes, T., Carraher, D.W. & Schliemann, A.D. (1985). Mathematics in the streets and in schools. British Journal of Developmental Psychology, 3, 21-29. In T.P. Carpenter, J.A. Dossey, & J. Kochler (eds.) Classics in mathematics education research, Reston, VA: NCTM.

Unit 3: Algebra and approaches to learning (SN)

Clements, D.H. & Sarama, J. (2009) Learning and Teaching Early Math: The Learning Trajectories Approach. Chapters 10. New York, Routledge.

Fuson, K.C. (2009) Avoiding misinterpretations of Piaget and Vygotsky: Mathematical teaching without learning, learning without teaching, or helpful learning-path teaching? Cognitive Development, Volume 24, Issue 4, 2009, Pages 343-361.

Resnick, L. B. and Ford, A. W. (1981) Psychology of mathematics for instruction. NJ: LEA: Chapter 2.

Unit 4: Critical and Equity perspectives (RD)

Fennema, E. (1996) Scholarship, gender and mathematics. In P. Murphy and C. Gipps (eds.) Equity in the classroom: towards effective pedagogy for girls and boys, London: Falmer Press (8 pages).

Skovsmose, O. (2007) Students' foregrounds and the politics of learning obstacles. In E. U. Gellert and E. Jablonka (Eds.) Mathematization and demathematization – social, philosophical and educational ramifications. (8 pages)

Valero, P. (2009). What has power got to do with mathematics education. Critical issues in mathematics education, 237-254. (13 pages)