12th International Congress on Mathematical Education
Posters 7
8 July – 15 July, 2012, COEX, Seoul, Korea

PROFILES OF STUDENTS' ARITHMETICAL KNOWLEDGE ACQUIRED IN AND OUTSIDE SCHOOL

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A growing body of research highlights that children's everyday mathematical knowledge is often situation-driven and produced in the doer's life-world (e.g. Lave, 1988). Past research (Khan, 2004) suggests that children from low-income families often experience difficulties in mathematics, are at the risk of failure but possess functional skills and competently perform the calculations needed in their workplace activities. In this report from an ongoing research study, we present profiles of such knowledge prevalent among middle graders living in a large urban slum in Mumbai that has a vibrant economy in the form of house-hold based workshops, small scale factory and manufacturing units, etc. Many children from the locality from an early age participate in the house-hold based income-generating practices or get exposed to them. These works include embroidery and zari work (sequin-stitching), garment stitching, leather work, bag-wallet-purse making, food delivery, etc. One of the objectives of the study is to explore the nature of everyday mathematical knowledge that these children have, the opportunities available to them to gather such knowledge and find the possible connections with school mathematics.

The sample of 12-13 year olds is drawn from two municipal corporation-run schools located in the slum. Data collection using ethnographic methodology and few rounds of students' interviews led to the profiles of their knowledge of numbers, enumeration ability of number-sequence, currency knowledge, knowledge of arithmetical operations, approximation-estimation skills, use of different informal units of measurements based on convenience. Some of these units are old British units no longer taught in schools. Competence in currency and mental computations in context were prominently visible but there were difficulties in reading and writing numbers bigger than 3 digits although dealing with those numbers as amounts of money was correct. Children also showed knowledge of reality perspective, optimality, decision making, etc. With school education becoming increasingly valued as a gateway to future welfare, many students opt for after-school extra coaching classes even at the cost of hard-earned money and precious work-time, which in turn plays a role in building arithmetical knowledge among the children.

References

Khan, F. A. (2004). Living, Learning and Doing Mathematics: A Study of Working Class Children in Delhi. Contemporary Education Dialogue, 2, 199-227.

Lave, J. (1988). Cognition in Practice. Cambridge, UK: Cambridge University Press.