INTERACTION BETWEEN BELIEF AND PEDAGOGICAL CONTENT KNOWLEDGE OF TEACHERS WHILE DISCUSSING USE OF ALGORITHMS

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Elementary education in India has long held teaching of algorithms as the prime focus of teaching mathematics at this level. Likewise there is co-occurence of widespread belief among teachers that there is just *one best algorithm* for each operation that should be focused while teaching in the classroom. This has been challenged in the new curriculum framework (NCERT, 2006, p.19) by providing space for alternative methods that students come up and engaging students in understanding why algorithms work.

In this poster we will graphically display the results of thematic analysis of a session conducted in a workshop as part of a 2 year long professional development program involving 4 primary and 8 middle school mathematics teachers from a public school system. The session involved discussion about subtraction algorithm followed by multiplication where in teachers engagement with belief about teaching algorithm was witnessed. For some teachers the engagement was in form of resistance to engage with alternative methods and questions about how they work, as they perceived it to cause confusion among students since they would not be able to understand the concepts. Resistance was also on account of the rules related to algorithm which teachers felt cannot be broken like "borrowing from left from the same number". Teachers also engaged by sharing the explanation of algorithms which ranged from procedures involving numbers to use of concepts like place value and distributivity for understanding the algorithm. Teachers voiced their challenges to these explanations using students' thinking and understanding as proxy. In comparison to subtraction, discussion of multiplication involved sharing of alternative methods, but teachers stressed the importance of students getting correct answers and speed or ease of calculation rather than conceptual clarity. These forms of engagement resulted in interaction between beliefs held by participating teachers and the pedagogical content knowledge related to algorithm leading towards engagement of teachers in understanding how algorithms work by teacher educators and why different algorithms give correct answers. These engagements might be the first steps towards teachers engaging with alternative ways to find solutions and evaluating generality of the alternative methods.

References

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