

A) General Information: -

1. Name of the Institute: DIET, Dilshad Garden, Delhi

2. Details of the Investigator(s):

Name	Designation	Place of posting at the time of project completion	Present place of posting	Contact No	E-mail
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3. Project/ Study Conducted Academic Session: 2015

4. Institute where Project/Study submitted: DIET, Dilshad Garden

5. Theme of the Project/Study: Teacher and Teaching

6. Level of the study: School

B) Summary of the Conducted Research work/Project/Study: -

1. Title: Exploring Pedagogical Content Knowledge of Mathematics

2. **Introduction:** Mathematics is a subject which we are all exposed to in our daily lives, yet it is feared by many. Mathematics is a language that helps us describe ideas and relationships drawn from our environment. All children can be friendly with mathematics, provided they have opportunities to explore mathematical ideas in ways that make personal sense to them, and opportunities to develop mathematical concepts and understanding.

Knowledge of mathematics and knowledge of mathematics representation are related to content knowledge, while knowledge of students and knowledge of teaching are related to pedagogical content knowledge. Further Pedagogical Content Knowledge is the knowledge which allows a teacher convert his own content knowledge to a form that student can understand. This study aimed to discuss Pedagogical content Knowledge from the primary mathematics teachers 'of Delhi. It was also purposed to investigate the interrelationship between mathematical knowledge and Pedagogical content Knowledge.

3. **Research Objectives:** The main objectives of the study were i) to study the teachers' pedagogical content knowledge of Mathematics on different dimensions, ii) to study the students' content knowledge of Mathematics (class-V students), iii) to study the relationship between the teachers' pedagogical content knowledge and students' content knowledge.

4. **Research Design:**

- **Research method(s):** Survey method under descriptive research was used in this study.
- **Tools and techniques used:** Self developed questionnaire for assessing students' and teachers' conceptual understanding were used for data collection. 30 and 25 test items were retained finally in both the tests for students and teachers respectively.
- **Statistical techniques:** Percentage was used for analyzing data.

5. **Research findings:** The study revealed that pedagogical content knowledge varies by teachers, student groups, and topics. The two teachers' pedagogical content knowledge did not look the same; further, the components comprising the pedagogical content

knowledge were manifested in different ways. Teacher's beliefs shaped their instructional decisions on planning, organization, and actions in instruction. Further it was also found that there is a relationship between content knowledge of students and pedagogical content knowledge of teachers. Overall percentage of correct responses by teachers and students is the same. Result shows if teacher has low pedagogical content knowledge, the conceptual understanding of students is low.

6. Educational implications: The present research tells teachers what areas they should focus on while teaching and what areas they should expand their content knowledge. Math content areas should be presented in an appropriate order. Workshops and discussion provide teachers with some insights into how to organize Math activities. To improve achievement level of students content knowledge teachers must improve their pedagogical content knowledge. From the analysis of responses from the students and teachers to the questionnaire, it is perceived that mathematics teacher's pedagogical content knowledge has significant effect on their learning outcomes/achievements in Mathematics. Some suggestive strategies to improve the pedagogical content knowledge of teachers are i) Encourage students to think logically while solve problems. ii) Use different ways/ methods to develop students understanding of mathematics. iii) Understand difficult areas/concepts for students in learning mathematics. iv) Provide hands-on activities. v) Explain concept of mathematics clearly. vi) Raise students' high level thinking skills in mathematics.

7. Scope of the study: Future research should have more representative numbers of participants. In addition, developing a richer understanding of what makes good math education for young children remains a work in progress. Similar study can be taken up in other subject and districts also.