

A) General Information: -

1. Name of the Institute: DIET, Dilshad Garden

2. Details of the Investigator(s):

Name	Designation	Place of posting the time of project completion	Present at place of posting	Contact No.	E-mail
1.Dr. Anil Kumar Teotia,	Principal	DIET, Dilshad Garden	DIET, Dilshad Garden	9891115415	anildietdilshad@gmail.com
2.Mr. Sunil Kumar	Sr. Lecturer	DIET, Dilshad Garden	DIET, Dilshad Garden	9540995251	sktet2010@gmail.com

3. Project/ Study Conducted Academic Session: 2016

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

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

6. Level of the study: Teacher education

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

- 1. Title:** Exploring Pedagogical Content Knowledge of D.El.Ed. trainees in Mathematics at Primary level
- 2. Introduction:** Mathematical knowledge is fundamental to the understanding and development of science and technology. For mathematics, there is no commonly accepted definition; it is usually described as a science that investigates abstract structures that it created itself for their properties and patterns. Mathematics introduces children to concepts, skills and thinking strategies that are essential in everyday life and support learning across the curriculum. Mathematics offers children a powerful way of communicating. They learn to explore and explain their ideas using symbols, diagrams. To develop the key processes involved in using and applying mathematics, opportunities should be given to children to use mathematics in a range of tasks.

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 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' and D.El.Ed. trainees 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 pedagogical content Knowledge of Teachers in Mathematics, ii) To study the Pedagogical Content Knowledge of D.El.Ed. Trainees in Mathematics, iii) to study the content Knowledge of students in Mathematics (class IV students), iv) to study the relationship between Pedagogical Content Knowledge of teachers and content knowledge of Students, v) To study the relationship between Pedagogical Content Knowledge of D.El.Ed. Trainees and

content knowledge of Students,vi) To compare the content knowledge of students,vii) To compare the Pedagogical Content Knowledge of teachers and D.El.Ed. Trainees.

4. Research Design:

- **Research method(s):** Survey method under descriptive research was used in this study.
- **Tools and techniques used:** Self developed questionnaire for students, D.El.Ed. trainees and teachers for assessing conceptual understanding were used for data collection purpose.
- **Statistical techniques:** Percentage was used for analyzing data.

5. Research findings: Further the study revealed that

- The percentage of correct responses of teacher trainee is higher than the teachers.
- The percentage of correct responses of group A (student taught) interacted by regular teacher is more than the teachers. Theme wise percentage is also more than teachers in all themes except fraction. It shows that teacher and students of group A have below average level of mathematical content knowledge as well as teacher show low performance than the students of their group.
- The percentage of correct responses of group B (taught by D.El.Ed. trainees is almost equal to the teacher trainees. Theme wise percentage is also equal to the teacher trainees. Theme wise percentage is also equal which shows that teacher trainee and students of group B have almost equal and below average level of mathematical content knowledge.
- Performance of both the group the group and their trainer is related in direct proportion. Most of teacher trainee and teacher show similar answer and similar mistake.
- Group A and B, teacher and teacher trainee responded correctly below 36% which is extremely low and below average.
- Mostly teachers and teacher trainees marked only one response for answers. It shows they are habitual for marking one correct response. They stop thinking after finding one correct response in the given options.
- There is a relationship between content knowledge of students and pedagogical content knowledge of teachers and teacher trainees. Overall percentage of correct responses by

teachers, teacher trainees and students is the same. Further result shows if teacher and teacher trainees have low pedagogical content knowledge, the content understanding of students is low.

6. Educational implications: : The present study 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 discussions provide teachers with some insights into how to organize math activities. Experts and teacher educators' ideas of emphasizing the connections between content areas can help teachers not to provide math activities fragmentally but to provide them coherently, while thinking about the conceptual knowledge. Inclusion of enriching open ended tasks, real life problems and methods based on constructivism in training and workshops/ seminars can change the attitude of D.El.Ed. trainees and teachers, towards mathematics. Therefore adequate effort should be made in teacher training centers to impact the skill of using concrete objects in teaching abstract concepts. These activities should include the improvisation of teaching learning materials in the teaching of mathematics especially as teachers had perceived themselves as being incompetent. These activities will eliminate the rote memorization of rules in D.El.Ed. trainees and primary school teachers which they pass on to students.

7. Scope of the study: Similar researches may have larger sample of students and teachers. More research is needed on teacher knowledge in different Mathematical areas/concepts concerning elementary education that would allow us to examine in what ways existed frameworks on teacher knowledge can be used or extended. Similar study can be conducted at upper primary and secondary level for students, teacher and would be teachers. Such studies can be taken up in other subjects, districts also.