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**Title** - *"A Study of Effect of Constructivist Learning Environment on Understanding of Mathematics and its Nature in Relation to Creativity and Socio-cultural Background of Secondary School Students"*

**Abstract :-** In the present study the investigator developed learning environment in critical constructivist perspective to develop mathematical understanding in relation to creativity and socio-cultural background of the secondary students. For that, the change in the role of teacher, students, teacher preparation, expectation, teaching strategies was developed to promote a genuine change in mathematics learning environment to develop mathematical understanding. The interactive effects of the two learning environment (constructive learning environment and traditional learning environment) were analysed for developing mathematical understanding with the creative abilities and socio-cultural background of the 200 secondary school students (class IX) of two government schools of Delhi. The study was based on the experimental design and investigated the following research questions:-

i) As compared to the traditional learning environment do constructivist learning environment for teaching mathematics enhance the mathematical understanding and understanding of the nature of mathematics. ii) How does the creative ability of the students interact with the mathematical understanding and understanding of the nature of mathematics of the students, when the students are exposed to constructivist learning environment? iii) How does the socio-cultural background of the students interact with the mathematical understanding and understanding of the nature of mathematics of the students when the students are exposed to constructivist learning environment? The statistical techniques used for the analyses of the data included descriptive, graphical and inferential.

### **Major Findings :**

1. The students subjected to constructivist learning environment had better understanding of mathematics (both aspects, instrumental and relational) and nature of mathematics than the students subjected to traditional learning environment of the total sample.
2. The students subjected to constructivist learning environment had better understanding of mathematics (both aspects, instrumental and relational) and nature of mathematics than the students subjected to traditional learning environment of the first school.
3. The students subjected to constructivist learning environment had better understanding of mathematics (both aspects, instrumental and relational) and nature of mathematics than the students subjected to traditional learning environment of the second school.

4. Teacher, socio cultural background and verbal creativity do not interact together with both understanding of mathematics (both aspects, instrumental and relational) and nature of mathematics of the students in the total sample.
5. Teacher, socio cultural background and non verbal creativity do not interact together with both understanding of mathematics (both aspects, instrumental and relational) of the students in the total sample.
6. Non verbal creativity, teacher and socio cultural background interact with the understanding of nature of mathematics of the students in the total sample.
7. In the controlled group, teacher, verbal creativity and socio cultural background do not interact with instrumental mathematical understanding but interact effectively with relational mathematical understanding.
8. In the experimental group, teacher, verbal creativity and socio cultural background do not interact with both understanding of mathematics (both aspects, instrumental and relational) and nature of mathematics of the students.
9. In the controlled group, teacher, non verbal creativity and socio cultural background do not interact with both understanding of mathematics (both aspects, instrumental and relational) and nature of mathematics of the students.
10. In the experimental group, teacher, non verbal creativity and socio cultural background do not interact with both understanding of mathematics (both aspects, instrumental and relational) and nature of mathematics of the students.
11. In the total sample, the following pair of variables interacted significantly with relational mathematical understanding of the students.a)Teacher and socio cultural background,b)Teacher and non verbal creativity,c)Non verbal creativity and socio cultural background.
12. In the controlled group, the following pair of variables interacted significantly .a)Teacher and socio cultural background on instrumental mathematical understanding,b)Teacher and non verbal creativity on relational mathematical understanding.
13. In the experimental group teacher and non verbal creativity interacted significantly on nature of mathematical understanding.
14. In the total sample, the following variables main effects were significant:a)Teacher on instrumental mathematical understanding,b)Non verbal creativity on instrumental mathematical understanding,c)Verbal creativity on nature of mathematical understanding,d)Teacher on nature of mathematical understanding.
15. In the experimental group main effect of a) creativity on instrumental mathematical understanding,b)teacher on nature and both aspects of mathematical understandings were significant:
16. In the total sample, the students taught by teacher  $T_2$  performed better in all the four sub groups in comparison with the students taught by teacher  $T_1$  on relational mathematical understanding.
17. The socio cultural background does not make any effect on both, the understanding of mathematics (both aspects, instrumental and relational) and nature of mathematics of the students.
18. The students with high non verbal creativity tend to perform better than the students with low non verbal creativity.