

**Name of the Scholar :** Rajiv Lal  
**Name of Supervisor :** Dr. Roohi Fatima  
**Department :** Institute of Advance Studies in Education  
Faculty of Education, Jamia Millia Islamia  
New Delhi-110025

**Effectiveness of Classroom Instructional Design with Cybernetic Principles of Learning in Reducing Mathematics Anxiety of Secondary School Students'**

---

**ABSTRACT**

**Problem:** Mathematics anxiety is an intense emotional feeling of anxiety that students have about their ability to understand and do mathematics. Students who suffer from mathematics anxiety feel that they are incapable of doing activities and classes that involve mathematics. It is assumed that nature of behaving individual & evaluated environment is responsible for mathematics anxiety.

The present investigation is an attempt to examine effectiveness of classroom instructional design with Cybernetic Principles of Learning in reducing mathematics anxiety of secondary school students.

**Objectives:**

1. To study mathematics anxiety of secondary school students'.

**Sub objective:**

- 1.1. To study mathematics anxiety on the affective and cognitive dimensions in the secondary school students'.
2. To develop classroom instructional design with cybernetic principles of learning.
3. To develop classroom instructional design with non cybernetic approach.
4. To compare the effectiveness of classroom instructional design with cybernetic principles of learning and non-cybernetic approach in reducing secondary school students' mathematics anxiety.
5. To compare the effectiveness of classroom instructional design with cybernetic principles of learning and non cybernetic approach on affective and cognitive dimensions in reducing mathematics anxiety of secondary school students'.
6. To evaluate the effectiveness of these approaches on the performance of the secondary school students'.
7. To evaluate the effectiveness of these approaches on the learning strategy of the secondary school students'.

**Null hypothesis:**

1. There is no mathematics anxiety in secondary school students'.
2. There is no significant difference in reducing mathematics anxiety of secondary school students' teaching with classroom instructional design with cybernetic principles of learning and non-cybernetic approach.
3. There is no mathematics anxiety on affective and cognitive dimensions of secondary school students'.
4. There is no significant difference in reducing mathematics anxiety on affective and cognitive dimensions of the secondary school students' teaching with classroom instructional design with cybernetic principles of learning and non cybernetic approach.
5. There is no significant difference in the performance of secondary school students' teaching with these approaches.

6. There is no difference in learning strategies of the secondary school students' teaching with these approaches.

### **Methodology:**

An ex post facto, quasi experimental design was considered most feasible and hence adopted for the study. The pre-test, post-test experimental design was employed in this study. The sample used for the study was purposive sampling Non- Probability procedures. The sample was divided into two methods of teaching classroom instructional design. The syllabus from Madhyamic Shiksha Vibhag of Board of School Education Haryana was taught to sixteen sections of VIII, IX and X classes to whole of the year by investigator and seven other teachers from Govt. /Govt. Aided School to Control group and Experimental group.

There were 575 students study in total selected eight schools. But 522 students were present in the post test. The sample of students of two sections A and B of classes VIII, IX and X classes were exposed to two class-room instructional design; non- cybernetic and cybernetic approach. Eight Math teachers, one whom was the researcher, taught VIII, IX, and X classes. Six Math teachers from six different schools taught classes VIII and IX from both treatment groups , one whom was the researcher for the session 2008-09 and two Math teachers from two schools taught X class with both treatment groups (Section A & Section B) for the year 2009-10. Eight Mathematics teachers taught sixteen sections A and B forms the two group i.e. Experimental and control group. The section or group with Non cybernetic method is control group (Section B) and section or group with cybernetic teaching method is considered as experimental group (Section A). To collect the data the research tools, used were Mathematics Anxiety Rating Scale Short-Version (MARS-S) to measure math anxiety, Mathematics Anxiety questionnaire (MAQ) to measure math anxiety at cognitive and affective domain, Self Report Learning Strategy Questionnaire (SRLSQ) to measure learning strategies, unit-test and annual exam results to measure performance, analysis of responses from activities of feedback. The collected data were treated using the means, S.D, S.E, C R or t-test.

### **Major Findings:**

- (1) Result of the investigation shows that there exists mathematics anxiety in secondary school students, class 10<sup>th</sup> and 9<sup>th</sup> students' experiences high and of class 8<sup>th</sup> students' have very little or minimum amount of mathematics anxiety.
- (2) Finding revealed that classroom instruction design with cybernetic principles of learning is highly effective in reducing mathematics anxiety of secondary school students.
- (3) Similarly there exists mathematics anxiety at cognitive and affective domain also; maximum for 10<sup>th</sup> and 9<sup>th</sup> class students' and minimum for 8<sup>th</sup> class students and even 8<sup>th</sup> class students' do not show Mathematics anxiety at affective dimension.
- (4) Classroom instruction design with cybernetic principles of learning is very effective in reducing mathematics anxiety; reduce math anxiety at cognitive and affective domain also.
- (5) Finding shows that classroom instruction design is very effective on the performance of students.
- (6) Result shows that not much difference on the learning strategies of students from both the sections A & B when students learns in groups with their peers, talk with each others, with manipulated subject matter, prove assumption with activities, project work etc. But their exist difference in learning strategies in terms of their prior missing knowledge, directing attention to the task, monitoring etc