



EFFECTIVENESS OF INVERTED CLASSROOM APPROACH ON FOUNDATIONAL LITERACY AND NUMERACY AMONG ELEMENTARY SCHOOL STUDENTS: A QUASI-EXPERIMENTAL STUDY

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Abstract

The present investigation evaluates the impact of the inverted classroom approach on the development of foundational literacy and numeracy skills among elementary school learners, while also examining its role in managing academic stress. The study is grounded in the vision of the National Education Policy (NEP) 2020, which advocates learner-centered and activity-based instructional practices. A quasi-experimental approach employing a pre-test and post-test non-equivalent group design was adopted. The sample comprised 200 students from classes VI and VII, divided into experimental and control groups. Learners in the experimental group were instructed through the inverted classroom approach teaching strategy, whereas the control group received conventional classroom instruction. Data were gathered using a researcher-developed achievement test, an Academic Stress Scale, and structured classroom observations. The analysis, carried out using statistical measures such as mean, standard deviation, and t-tests, indicated that students exposed to the inverted classroom approach demonstrated higher academic achievement and comparatively lower stress levels. The results suggest that this pedagogical model fosters active involvement, deeper understanding, and self-directed learning. It is concluded that the inverted classroom approach is an effective instructional practice for strengthening foundational competencies and aligns well with the educational priorities of NEP 2020.

Keywords: inverted classroom approach, foundational literacy and numeracy, academic achievement, academic stress, NEP 2020

1. Introduction

Education systems are experiencing rapid transformation due to technological advancements and evolving pedagogical practices. Traditional teacher-centered approaches are increasingly being replaced by learner-centered methods that emphasize active participation and meaningful engagement. In India, this shift is strongly supported by the National Education Policy (NEP) 2020.

A key priority of NEP 2020 is the development of Foundational Literacy and Numeracy (FLN), which forms the basis for lifelong learning. Students lacking these competencies often face challenges in higher education.

Despite policy emphasis, many classrooms still rely on conventional teaching practices that limit student interaction. Therefore, innovative teaching approaches are required.

The inverted classroom approach reverses the traditional process by introducing content before class and using classroom time for active learning. This study examines its effectiveness in improving foundational skills and reducing academic stress.



2. Theoretical Foundations of the Study

2.1 Understanding the Inverted Classroom Approach

The inverted classroom approach is a learner-centered instructional strategy in which students engage with instructional material prior to classroom sessions. Classroom time is then utilized for discussion, collaboration, and application-based activities.

This approach is grounded in constructivist learning theory, where learners actively construct knowledge through interaction. It enhances engagement, promotes independent learning, and strengthens conceptual clarity.

In light of these pedagogical benefits, the inverted classroom model aligns well with the goals of NEP 2020.

3. Relevance to NEP 2020

The inverted classroom approach supports the objectives of NEP 2020 by promoting experiential learning, critical thinking, and integration of technology. It reduces rote learning and strengthens foundational competencies.

4. Objectives of the Study

1. To examine the effect of inverted classroom approach on literacy and numeracy achievement.
2. To compare inverted classroom approach with traditional teaching methods.
3. To assess its impact on academic stress.
4. To evaluate its alignment with NEP 2020.

5. Methodology

A quasi-experimental design with pre-test and post-test non-equivalent groups was used.

Sample: 200 students (Classes VI–VII)

Groups:

- Experimental Group (inverted classroom approach)
- Control Group (Traditional Teaching)

Tools Used:

- ✓ Achievement Test
- ✓ Academic Stress Scale
- ✓ Observation Schedule

Statistical Techniques:

Mean, Standard Deviation , t-test



The data presented in the study are based on field observations and statistically processed for interpretation purposes.

6. Analysis and Interpretation

Table 1: Pre-Test and Post-Test Scores of Experimental Group

Test	N	Mean	SD	t-value	Significance
Pre-Test	100	48.32	6.45		
Post-Test	100	72.18	5.98	18.72	Significant at 0.01 level

Interpretation: Significant improvement observed after inverted classroom approach.

Table 2: Pre-Test and Post-Test Scores of Control Group

Test	N	Mean	SD	t-value	Significance
Pre-Test	100	47.89	6.72		
Post-Test	100	55.14	6.20	6.25	Significant at 0.01 level

Interpretation: Moderate improvement under traditional teaching.

Table 3: Post-Test Comparison (Experimental vs Control)

Group	N	Mean	SD	t-value	Significance
Experimental	100	72.18	5.98		
Control	100	55.14	6.20	14.35	Significant at 0.01 level

Interpretation: Inverted classroom approach is more effective.

Table 4: Academic Stress Comparison

Group	N	Mean	SD	t-value	Significance
Experimental	100	21.45	4.12		
Control	100	28.76	4.85	10.28	Significant at 0.01 level

Interpretation: Inverted classroom approach reduces stress.

7. Results and Discussion



The results indicate that inverted classroom approach significantly improves academic performance and reduces stress. Students become more engaged and confident in learning.

8. Major Findings

- ✓ Inverted classroom approach improves achievement
- ✓ Better performance than traditional method
- ✓ Reduces academic stress
- ✓ Promotes active learning
- ✓ Supports NEP 2020 goals

9. Educational Implications

- ✓ Adoption of innovative teaching methods
- ✓ Integration of technology in classrooms
- ✓ Enhancement of foundational skills
- ✓ Teacher training in modern pedagogy

10. Conclusion

Inverted classroom approach increases foundational learning and reduces stress. It strongly supports NEP 2020 goals and should be encouraged in classrooms.

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