

Effectiveness of Blended Learning in Secondary Education: A Comparative Study of Urban and Rural Schools**Poonam Chaubey****Research Scholar****C. C. S. University, Meerut****Abstract**

Blended learning, which integrates online and face-to-face instructional methods, holds the promise of enhanced engagement, personalized learning, and access to resources. However, its implementation and efficacy can be influenced by contextual factors such as school infrastructure, technological accessibility, and socioeconomic demographics, which often differ significantly between urban and rural areas. This study employed a quasi-experimental design to compare the academic performance, student engagement, and teacher perceptions of blended learning in matched groups of urban and rural secondary schools over an academic year. Pre- and post intervention assessments, along with qualitative data from student and teacher surveys, were utilized. Preliminary findings suggest that while blended learning can yield positive outcomes in both settings, its effectiveness is moderated by factors such as digital literacy, teacher training, and the availability of robust technological infrastructure. This study contributes to the understanding of how to optimize blended learning strategies for diverse educational contexts within secondary education.

Keywords: Blended Learning, Traditional Learning, Secondary Education, Urban Schools, Rural Schools, Quasi-Experimental, Academic Performance, Student Engagement.

Introduction

The landscape of secondary education is continuously evolving, driven by technological advancements and a growing understanding of diverse learning needs. Traditional classroom instruction, while foundational, often struggles to cater to the individual pace and learning styles of all students. In response, blended learning models have emerged as a promising alternative, seeking to harness the benefits of both face-to-face interaction and digital resources (Graham, 2006). Blended learning, defined as a pedagogical approach that combines instructor-led classroom activities with computer-mediated activities, offers students a degree of control over time, place, path, and pace of their learning (Horn & Staker, 2014).

The potential advantages of blended learning are numerous, including increased student autonomy, access to a wider range of educational materials, opportunities for differentiated instruction, and the development of crucial digital literacy skills (Means et al., 2013). However, the successful implementation and ultimate effectiveness of such models are not universally guaranteed. Critical factors such as technological infrastructure, teacher training and preparedness, student access to devices and reliable internet, and the socioeconomic context of the student population can significantly influence the outcomes (Cuban, 2001; Selwyn, 2016).

A significant divide often exists between urban and rural educational environments concerning these enabling factors. Urban schools may benefit from greater access to resources, advanced technology, and a larger pool of trained personnel. In contrast, rural schools often grapple with limited funding, geographical isolation, challenges in attracting and retaining qualified teachers, and disparities in technological access for their students. This disparity raises a crucial question: does the effectiveness of blended learning in secondary education differ between urban and rural school settings, and if so, what are the underlying reasons?

This study aims to address this gap by conducting a comparative analysis of the effectiveness of blended learning in secondary schools located in urban and rural areas. By employing a quasi experimental design, we seek to identify whether blended learning yields comparable or divergent results in terms of academic performance, student engagement, and teacher perceptions across these distinct geographical and socioeconomic contexts. Understanding these differences is vital for developing equitable and

effective educational policies and practices that leverage technology to benefit all students, regardless of their geographical location.

Literature Review

Tong, D. H., Uyen, B.P., Ngan, L.K. (2022) conducted a study on The effectiveness of blended learning on students' academic achievement, self-study skills and learning attitudes: A quasiexperiment study in teaching the conventions for coordinates in the plane. Aim of this study was to investigate the effectiveness of the flex model of blended learning in teaching the mathematics subtopic of coordinates in the plane through the improvement of students' academic achievement, self-study skills and learning attitudes. Results of the study revealed that blended learning positively impacts students' academic achievement in the experimental class compared with the control class.

Linguete, J. (2023) presented a paper on The Level of Effectiveness of Blended Learning Among Public Secondary Schools in the Division of Quezon. The findings of the study revealed that the effectiveness of blended learning among public secondary schools were considered effective.

Buao, A. B., Cabeje, G.S. Sabardan, G.S., Sarmiento, J. O, (2022) conducted a study on the Blended Learning Education: The Effectiveness of New Ways of Teaching and Learning in Enhancing Students' Academic Achievement. This study aimed to investigate and determine the effectiveness of blended learning in the context of new ways in teaching and learning to enhance students' academic achievement. This study concluded that Blended learning is one of the most innovative pedagogical strategies available in the context of remote learning, helping to handle problems like the knowledge explosion, the increase in educational demand, and the issue of crammed lectures.

Objectives of the Study

- i. To study the academic achievement of the students of Urban Schools.
- ii. To study the academic achievement of the students of Rural Schools.
- iii. To study the Effectiveness of Blended Learning on academic achievement of the students of Urban Schools.
- iv. To study the Effectiveness of Blended Learning on academic achievement of the students of Rural Schools.

Hypothesis of the Study

- i. There is no significant difference between pretest scores of academic achievement of students of Urban Schools.
- ii. There is no significant difference between pretest scores of academic achievement of students of Rural Schools.
- iii. There is no significant difference between posttest scores of academic achievement students of Urban Schools.
- iv. There is no significant difference between posttest scores of academic achievement students of Rural Schools.
- v. There is no significant relationship between academic achievement and Blended Learning.

Delimitations of the study:

1. The study was confined to 10 schools of Meerut district.
2. Only the students of class 8th were selected as the sample of the study.
3. Only 100 boys and 100 girls were identified for the present investigation.

Population and sample

Population of this study include all the students studying at the secondary school level in Meerut district. The sample extracted out of this population consists of a total no. of 200 students studying in class 8th From 10 secondary schools of Meerut district using incidental sampling technique. Out of 200 students 100 were boys 100 were girls.

Research Design

This study employed a quasi-experimental design using a pre-test and post-test approach. A quasi experimental design was chosen because random assignment of individual students or classrooms to blended or traditional learning conditions was not feasible within the existing school structures. Instead, intact groups of classes were assigned to either the blended learning intervention or a traditional learning control group. This design allows for the examination of the effect of an intervention by comparing outcomes between groups exposed to the intervention and those not exposed, while acknowledging the limitations of non-random assignment.

Participants and Setting

The study involved a sample of ten secondary schools: five urban schools and five rural schools of Meerut city. Total 200 students of 8th class were randomly selected as sample of this study. Within each school, students were divided into two groups i.e. control group and experimental group. In each school, these groups were assigned to the traditional learning group and blended learning group. The Investigator had applied pretest (Before Blended learning) and posttest (After Blended learning) for finding the effect of blended learning on academic achievement of The students of Urban and Rural schools of Meerut city.

Tools of Study

The investigator had used self made Achievement Test (English, Hindi, Mathematics, Science and Social Science) contains 25 questions. For every correct answer 2 marks were given. Reliability and validity of the Achievement Test was .89. after discussion with subject teachers, principal and test and retest method.

Statistical Techniques

Mean, Median, t-value and Pearson's Correlation.

Data Analysis

Objective-1: To study the academic achievement of the students of Urban Schools.

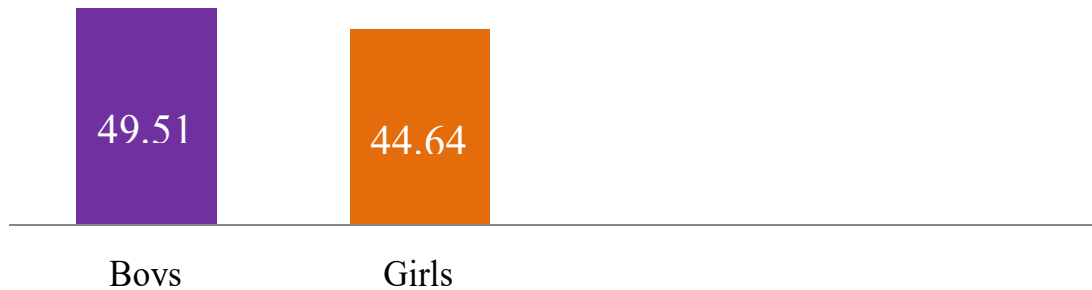
H₁: There is no significant difference between pretest scores of academic achievement of students of Urban Schools.

Table-1: pretest scores of academic achievement of the students of Urban Schools

S. No.	Group	N	Mean	S.D.	t-value
1.	Boys	50	49.51	5.20	2.35
2.	Girls	50	44.64	6.83	

Table no.1 shows that the pretest scores of academic achievement of Boys and Girls were 49.51 and 44.64. But on the basis of mean observation it would not be clear that whether these differences are really significant or not. Therefore, to solve this problem the data was further treated by inferential statistics i.e. t tests. Our computed t value is 2.35. The obtained result suggests that, our computed t-value is much greater than the critical values required to reach 0.01 and 0.05 levels of significance respectively. So, the null hypothesis that there is no significant difference between pretest scores of academic achievement of students of Urban Schools is rejected.

Pretest scores of academic achievement of the students of Urban Schools



Objective-2: To study the academic achievement of the students of Rural Schools.

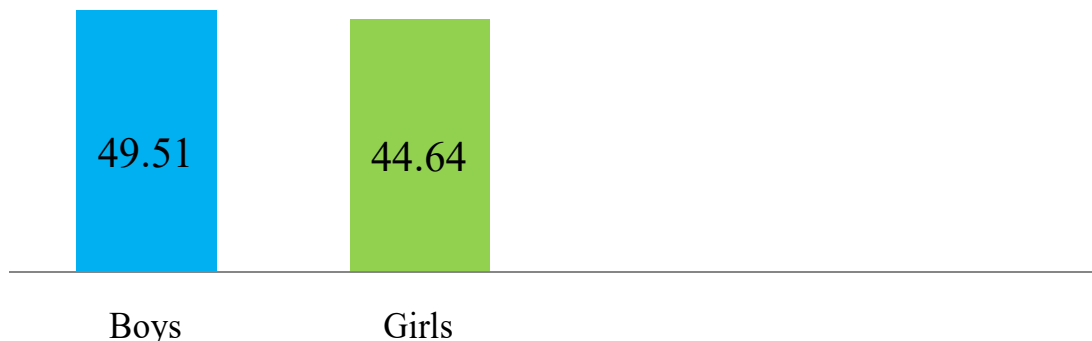
H₂: There is no significant difference between pretest scores of academic achievement of students of Rural Schools.

Table-2: Pretest scores of academic achievement of the students of Rural Schools

S. No.	Group	N	Mean	S.D.	t-value
1.	Boys	50	40.2	3.76	1.90
2.	Girls	50	38.94	4.27	

Table no.2 shows that the pretest scores of academic achievement of Boys and Girls were 40.2 and 38.94. But on the basis of mean observation it would not be clear that whether these differences are really significant or not. Therefore, to solve this problem the data was further treated by inferential statistics i.e. t tests. Our computed t value is 1.90. The obtained result suggests that, our computed t-value is much greater than the critical values required to reach 0.01 and 0.05 levels of significance respectively. So, the null hypothesis that there is no significant difference between pretest scores of academic achievement of students of Rural Schools is rejected.

Pretest scores of academic achievement of the students of Rural Schools



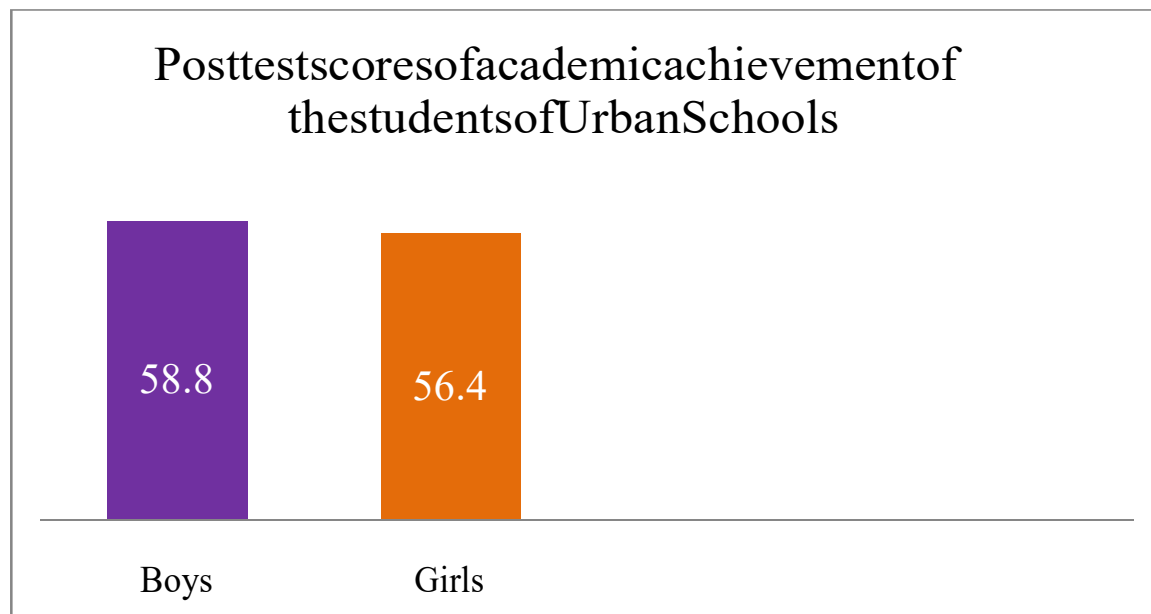
Objective-3: To study the Effectiveness of Blended Learning on academic achievement of the students of Urban Schools.

H₃: There is no significant difference between posttest scores of academic achievement of students of Urban Schools.

Table-3: Posttest scores of academic achievement of the students of Urban Schools

S. No.	Group	N	Mean	S.D.	t-value
1.	Boys	50	58.8	5.34	1.58
2.	Girls	50	56.4	5.47	

Table no.3 shows that the posttest scores of academic achievement of Boys and Girls were 58.8 and 56.4. But on the basis of mean observation it would not be clear that whether these differences are really significant or not. Therefore, to solve this problem the data was further treated by inferential statistics i.e. t tests. Our computed t value is 1.58. The obtained result suggests that, our computed t-value is much greater than the critical values required to reach 0.01 and 0.05 levels of significance respectively. So, the null hypothesis that there is no significant difference between posttest scores of academic achievement of students of Urban Schools is rejected.



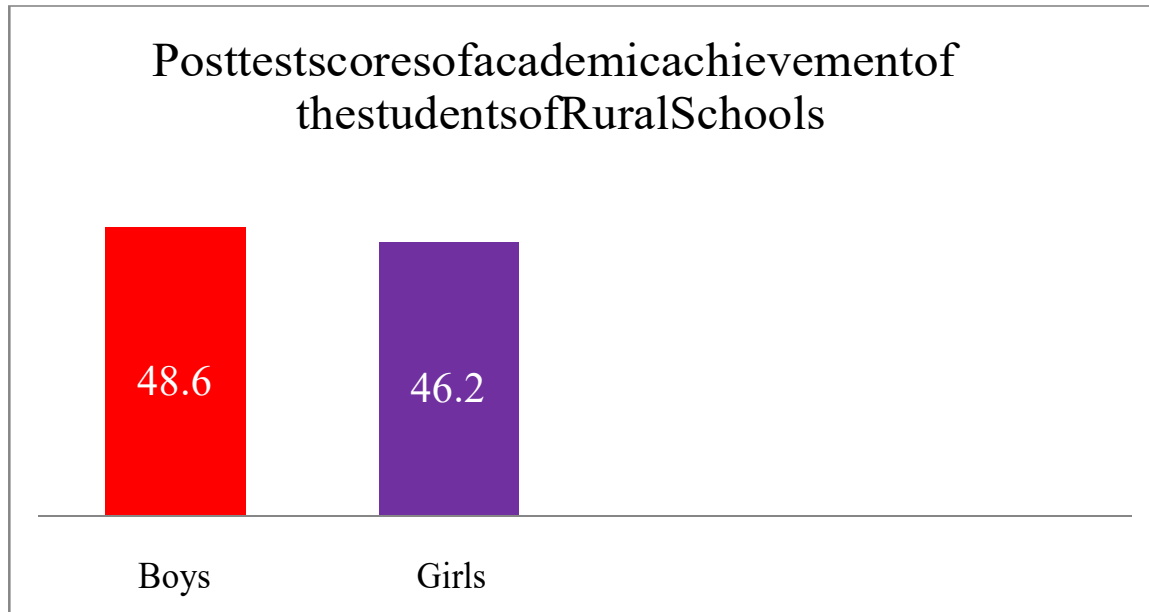
Objective-4: To study the Effectiveness of Blended Learning on academic achievement of the students of Urban Schools.

H₄: There is no significant difference between posttest scores of academic achievement of students of Rural Schools.

Table-4: Posttest scores of academic achievement of the students of Rural Schools

S. No.	Group	N	Mean	S.D.	t-value
1.	Boys	50	48.6	2.94	1.43
2.	Girls	50	46.2	3.65	

Table no.4 shows that the posttest scores of academic achievement of Boys and Girls were 48.6 and 46.2 but on the basis of mean observation it would not be clear that whether these differences are really significant or not. Therefore, to solve this problem the data was further treated by inferential statistics i.e. t tests. Our computed t value is 1.43. The obtained result suggests that, our computed t-value is much greater than the critical values required to reach 0.01 and 0.05 levels of significance respectively. So, the null hypothesis that there is no significant difference between posttest scores of academic achievement of students of Rural Schools is rejected.



Objective-5: To study the relationship between academic achievement and Blended Learning.

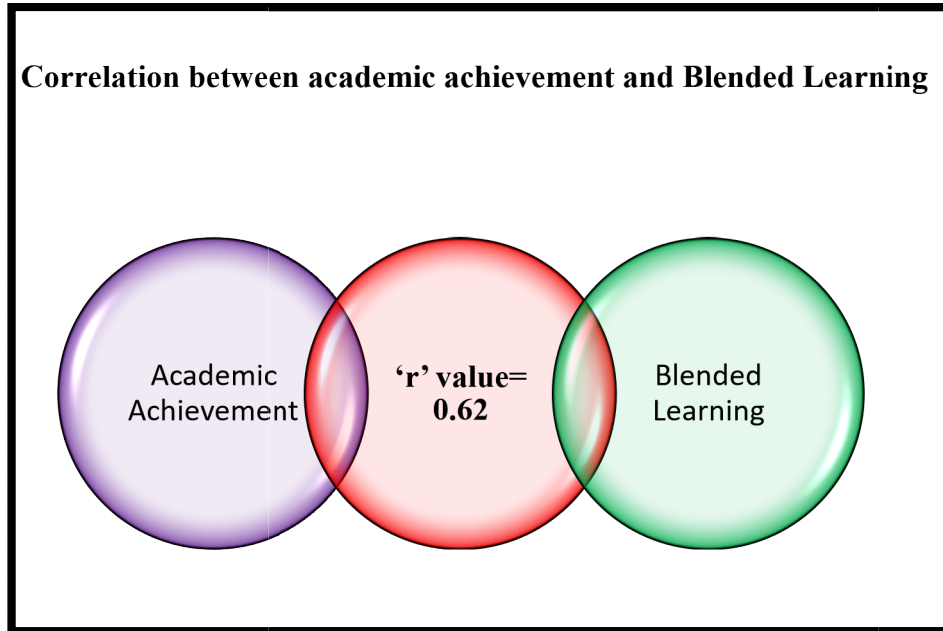
H₅: There is no significant relationship between academic achievement and Blended Learning.

Table-5: Correlation between academic achievement and Blended Learning

Variables	N	Coefficient of Correlation “r”	Significant level
Emotional Intelligence	200	0.62	0.05
Social Adjustment			

The result in Table no.5 shows that the coefficient of correlation between Academic Achievement and Blended Learning of students was 0.62 which revealed a significant relationship between Achievement and Blended Learning. It reports that the Students who have been taught with blended learning approach have higher academic achievement and Students who have been

taught with traditional learning approach have lower academic achievement. Thus, the hypothesis that there is no significant relationship between Academic Achievement and Blended Learning is rejected.



Conclusion

This comparative study demonstrates that the effectiveness of blended learning in secondary education is not a monolithic phenomenon but is significantly moderated by the urban and rural context. While blended learning shows promise in enhancing academic outcomes and student engagement in urban schools with more developed technological infrastructures, its implementation in rural schools faces substantial challenges related to digital equity, connectivity, and resource availability, which can negate its potential benefits.

References

- Tong, D. H., Uyen, B.P., Ngan, L.K. (2022), The effectiveness of blended learning on students' academic achievement, self-study skills and learning attitudes: A quasi-experiment study in teaching the conventions for coordinates in the plane, Heliyon, Volume 8, Issue 12, e12657, ISSN 2405-8440, Pp.1-14.
- Linguete, J. (2023). The Level of Effectiveness of Blended Learning Among Public Secondary Schools in the Division of Quezon. Psychology and Education: A Multidisciplinary Journal, 13(1), 1-19.
- Buao, A. B., Cabeje, G.S. Sabardan, G.S., Sarmiento, J. O, (2022), Blended Learning Education: The Effectiveness of New Ways of Teaching and Learning in Enhancing Students' Academic Achievement. Volume 5. 348-355.