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An Analysis Of Student Interest In Core Subjects And Their Academic Performance In Tirupati Rural Government Schools

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Abstract

This study examines the relationship between students' interest in core subjects and their academic performance among rural government school students in Ramachandrapuram Mandal, Tirupati District, Andhra Pradesh. Despite ongoing policy interventions to enhance educational access, disparities in learning outcomes persist, highlighting the need to understand the role of student-level factors such as interest and motivation. Using a quantitative research design, data were collected from 60 students selected through simple random sampling. A structured questionnaire was administered, and the data were analysed using percentage analysis and the Chi-square (χ^2) test. The results indicate a statistically significant positive association ($p < 0.05$) between students' interest in Mathematics and Science and their academic performance. The findings further reveal the influence of teacher support, parental involvement, study habits, and access to learning resources on student outcomes. The study underscores the importance of learner-centred pedagogies and supportive educational environments in improving academic achievement and reducing rural educational disparities.

Keywords: Student Interest; Academic Performance; Rural Education; Core Subjects; Government Schools

Introduction

Education is a vital driver of individual and societal development, promoting human capital formation, social mobility, and economic growth. In India, despite policy efforts to expand access and ensure equity, disparities in learning outcomes between urban and rural areas persist due to socio-economic and institutional challenges. Rural government schools, which serve disadvantaged communities, often face limitations such as inadequate infrastructure, scarce learning resources, and high student–teacher ratios. Family factors, including parental education and income, further influence students’ academic experiences.

Student interest plays a crucial role in academic achievement, particularly in core subjects such as Mathematics and Science. However, these subjects are often perceived as difficult in rural settings, leading to reduced motivation and lower performance.

This study examines the relationship between students’ interest in core subjects and their academic performance in Ramachandrapuram Mandal, Tirupati District, while considering the influence of socio-economic and school-related factors.

Review of Literature

The World Bank (2024) highlights that disparities between rural and urban schools continue to significantly affect learning outcomes across developing countries. The report underscores the importance of enhancing student engagement, improving access to educational resources, and strengthening teacher support systems to address these inequalities.

Similarly, UNESCO (2023) emphasizes that student motivation and active participation are critical determinants of academic success. It notes that rural students often face multiple barriers, including limited access to quality resources, shortages of trained teachers, and socio-economic constraints, which collectively hinder their academic interest and performance. These findings align with broader concerns about structural inequalities in rural education systems.

Pandita (2022) observed that a well-maintained, disciplined, and supportive school environment significantly enhances students’ motivation and participation in academic activities.

Pandey and Mehta (2022) found that digital learning tools and technology-based teaching methods significantly improve students’ interest and academic performance, particularly in subjects like Mathematics and Science. However, the accessibility of such resources remains uneven in rural areas.

Kumar and Sreeramulu (2021) specifically focused on government schools in Andhra Pradesh and reported that students tend to lose interest when the curriculum is not linked to their local context and everyday experiences, highlighting the need for contextualized teaching approaches.

Objectives of the Study

- 1 To examine students' interest in core subjects, particularly Mathematics and Science, and analyse their academic performance in rural government schools.
- 2 To assess the influence of socio-economic and family background on students' academic interest and achievement.
- 3 To identify the psychological, health, and environmental factors affecting students' study habits and learning outcomes.
- 4 To evaluate the role of school-related factors, including infrastructure, teacher support, and peer interaction, in shaping academic performance.
- 5 To explore students' career aspirations and suggest strategies to enhance interest and performance in core subjects among rural students.

Methodology

A descriptive and analytical design was adopted. Ramachandrapuram Mandal, Tirupati District, was selected due to its accessibility and representation of rural socio-economic conditions. A stratified random sample of 60 students from selected government schools was studied. Data were collected using a structured questionnaire and analysed using appropriate statistical methods.

Research Design: Descriptive and analytical research design was adopted to examine the relationship between students' interest in core subjects and their academic performance.

Study Area: Ramachandrapuram Mandal, Tirupati District, Andhra Pradesh (covering the villages of Kammakandriga, Kammapalli, Sorakayalapalam, Parakalava, Rayalacheruvu, Anupalli, Suravaripalli, Kammapalli (Pulikonada), Nethakuppam and Nethakuppam).

Sample Design: Stratified random sampling technique was used to select respondents from rural government schools.

Sample Size: 60 students studying in government schools across selected villages of Ramachandrapuram Mandal.

Tools of Data Collection: Structured questionnaire, interview schedule, rating scale, observation method, and informal interviews.

Data Analysis: Percentage analysis and Chi-square (χ^2) test were used to examine the association between students' interest in core subjects and their academic performance.

Table -1

Distributions of the Respondents by Gender

S. No	Gender	No. of Respondents	Percentage (%)
1	Female	30	50%
2	Male	30	50%
Total		60	100%
X²-Value		0.0**	
**Not Significant (D f=1)			

Table–1 reveals that out of the total respondents, 50 percent were females and the remaining 50 percent were males. It is observed that the respondents are equally distributed by gender.

It is found from the results of the Chi-square (χ^2) test that there is no significant association between genders. The obtained χ^2 -value of 0.0 is not statistically significant at the 0.05% level (D f = 1).

Table -2 Distributions of the Respondents by Age

S. No	Age	No. of Respondents	Percentage (%)
1	13	20	33.33%
2	14	20	33.33%
3	15	20	33.33%
Total		60	100%
X²-Value		0.0**	
**Not Significant (D f=2)			

Table–2 Interpretation reveals the age-wise distribution of the respondents. It is observed that 33.33 percent of the respondents are in the 13-year age group, 33.33 percent are in the 14-year age group, and the remaining 33.33 percent are in the 15-year age group. It is concluded that the respondents are equally distributed across all age groups.

It is found from the results of the Chi-square (χ^2) test that there is no significant association between age groups. The obtained χ^2 -value of 0.0 is not statistically significant at the 0.05% level (Df = 2).

Table -3 Distribution of the Respondents by Class

S. No	Class	No. of Respondents	Percentage (%)
1	8th	20	33.33%
2	9th	20	33.33%
3	10th	20	33.33%
Total		60	100%
X²-Value		0.0**	
**Not Significant (D f=2)			

Interpretation:

Table-3 presents the class-wise distribution of the respondents. It is observed that 33.33 percent of the respondents are studying in the 8th class, 33.33 percent are in the 9th class, and 33.33 percent are in the 10th class. It is concluded that the respondents are equally distributed among all class levels.

The results obtained from the Chi-square (χ^2) test reveal that there is no significant association between class levels. The corresponding χ^2 -value of 0.0 is not statistically significant at the 0.05% level (D f = 2).

Table -4 Distribution of Respondents by Caste

S. No	Caste	No. of Respondents	Percentage (%)
1	SC	17	28.33%
2	ST	25	41.67%
3	BC	5	8.33%
4	OC	13	21.67%
Total		60	100%
X²-Value		13.88**	
**Significant at 0.05 (D f=3)			

Table-4 Interpretation:

There is a significant difference in the caste-wise distribution of respondents. The majority belong to the Scheduled Tribe (ST) category (41.67%), followed by Scheduled Caste (SC) (28.33%) and Other Castes (OC) (21.67%), while Backward Classes (BC) represent only 8.33%. This shows that most respondents come from marginalized communities in rural areas.

Table -5 Distributions of the Respondents by their Liking of Mathematics

S. No	Response	No. of Respondents	Percentage (%)
1	Yes	35	58.33%
2	Sometimes	8	13.33%
3	Only easy topics	7	11.67%
4	No	10	16.67%
Total		60	100%
X²-Value		35.88**	
**Significant at 0.05%, (Df=3)			

Table-5 expresses the distribution of the respondents by their liking of Mathematics. It is observed that 58.33 percent of the respondents like Mathematics very much, 13.33 percent like it sometimes, 11.67 percent like only easy topics, and 16.67 percent do not like Mathematics. results obtained from the χ^2 -Test reveal that there is a significant difference in the opinions respondents regarding their liking of Mathematics. The corresponding χ^2 -Value is 35.88, which is statistically significant at the 0.05% level (D f = 3).

Table -6 Distributions of the Respondents by their Confidence in Solving Mathematics Problems

S. No	Response	No. of Respondents	Percentage (%)
1	Very confident	42	70%
2	Confident	8	13.33%
3	Not confident and afraid	10	16.67%
Total		60	100%
X²-Value		38.40**	
**Significant at 0.05%, (D f=2)			

Interpretation:

The data indicate that 70% of respondents are very confident in solving Mathematics problems, 13.33% are confident, and 16.67% lack confidence and feel anxious. The Chi-square test ($\chi^2 = 38.40$, df = 2) shows a significant difference at the 0.05 level, confirming variation in students' confidence levels.

Table -7 Distribution of the Respondents by Their Interest in Science

S. No	Response Option	No. of Respondents	Percentage (%)
1	Yes	45	75.00%
2	Sometimes	0	0.00%
3	Depends on topic	10	16.67%
4	No	5	8.3%
Total		60	100%
X²-Value		83.33**	
**Significant at 0.05%, (Df=3)			

Table-7

Interpretation:

The data indicate that 75% of respondents show clear interest in Science, 16.7% report interest depending on the topic, and 8.3% have no interest, with none indicating occasional interest. The Chi-square test ($\chi^2 = 83.33$) shows a significant difference at the 0.05 level, confirming that students' interest in Science varies significantly, with a majority demonstrating strong interest.

Table -8 Distributions of the Respondents On which Science Topic they like most

S. No	Response Option	No. of Respondents	Percentage (%)
1	Biology	35	58.33%
2	Physics	20	33.33%
3	Chemistry	0	0.00%
4	No	5	8.33%
	Total	60	100%
	X²-Value	50.0**	
	**Significant at 0.05%, (Df=3)		

Table8-**Interpretation**

The data show that 58.33% of respondents prefer Biology, 33.33% prefer Physics, and 8.33% show no interest, while none prefer Chemistry. The Chi-square test ($\chi^2 = 50.0$) indicates a significant difference at the 0.05 level, confirming that preferences for science topics vary significantly, with Biology being the most preferred.

Table -9 Distributions of the Respondents on Watching Science Programs and Videos at Home

S. No	Response Option	No. of Respondents	Percentage (%)
1	Often	20	33.33%
2	Sometimes	15	25.00%
3	Rarely	0	0.00%
4	No	25	41.67%
	Total	60	100%
	X²-Value	8.3**	
	**Not Significant at 0.05%, (D f=3)		

Table-9 Interpretation:

The data show that 41.67% of respondents never watch science programs at home, 33.33% watch them often, and 25% watch them sometimes, while none reported rarely. The Chi-square test ($\chi^2 = 8.33$) indicates no significant difference among respondents at the 0.05 level, suggesting that the frequency of watching science-related content does not vary significantly.

Table -10 Distribution of the Respondents by their Marks in the Last Exam

S. No	Marks Range	No. of Respondents	Percentage (%)
1	Above 80%	15	25.00%
2	79-60%	20	33.33%
3	60-45%	20	33.33%
4	Below 45%	5	8.3%
Total		60	100%
X²-Value		10.01**	
**Significant at 0.05%, (D f=3)			

Table-10 Interpretation:

The distribution shows that 33.3% of students scored 60–79%, another 33.3% scored 45–60%, and 25% scored above 80%, while only 8.3% scored below 45%. The Chi-square test ($\chi^2 = 10.01$) indicates a significant difference at the 0.05 level, confirming that academic performance varies across achievement levels.

Major Findings of the Study

The study, conducted among students from ten villages of Ramachandrapuram Mandal, ensured balanced rural representation with equal sample distribution. The respondents, primarily aged 13–15 years, reflect a focus on middle-school students. A majority of participants belonged to socially marginalized communities, with Scheduled Tribes (41.67%) and Scheduled Castes (28.33%) forming a significant proportion.

Parental education levels showed variation, though a considerable share had attained secondary education, indicating gradual educational progress. However, occupational patterns revealed limited diversity, with most fathers engaged in farming or labour work, and a large proportion of mothers involved in agricultural labour. The majority of families reported low income levels (below ₹50,000 per month), highlighting prevailing economic constraints.

In terms of academic aspects, overall performance was moderately satisfactory, with a notable proportion of high achievers. Science and Mathematics emerged as the most preferred and high-scoring subjects. However, examination-related stress was widely reported, and parental involvement remained moderate. Despite students demonstrating academic potential, limited recognition and encouragement were observed.

Suggestions and Recommendations

Based on the findings, several measures are proposed to enhance student interest and academic performance in rural government schools. Teachers should adopt learner-centred and activity-based methods, including visual aids and practical approaches, to improve understanding of core subjects. Strengthening school infrastructure and integrating digital learning resources are essential to bridge the rural–urban gap.

Parental involvement should be encouraged through regular interactions and awareness programmes to support learning at home, while maintaining the quality of mid-day meals to improve student health and attendance. Teacher training should be enhanced to promote effective pedagogy and address students' academic and psychological needs. Additionally, recognition systems and counselling support can help motivate students and reduce examination stress.

Policymakers should focus on equitable resource allocation and continuous monitoring to improve the overall quality of rural education.

Conclusion

The study establishes a significant relationship between students' interest in core subjects and their academic performance in rural government schools of Ramachandrapuram Mandal, Tirupati District. Higher interest in Mathematics and Science is associated with better academic outcomes, although performance is also influenced by socio-economic conditions, parental education, school infrastructure, and teaching practices.

The findings indicate that students from disadvantaged backgrounds face challenges such as limited resources, moderate parental support, and examination stress. However, the presence of motivated learners and satisfactory performance levels reflects the potential within rural education systems.

The study highlights the need for a comprehensive approach involving learner-centred teaching, improved infrastructure, teacher support, and community participation to enhance student interest, reduce disparities, and improve the overall quality of rural education.

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