

Comparative Study

Problem Solving Ability: A Comparative Study of Tribal and Non-Tribal High School Students in Ranchi Town

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ABSTRACT

This study investigates problem-solving abilities among high school students in Ranchi Town, exploring the influence of gender, ethnicity, and school type. It aims to examine the impact of these factors on problem-solving skills. A sample of 80 participants, evenly split between boys and girls, representing both tribal and non-tribal backgrounds, as well as government and private school students, was utilized. The Problem-Solving Ability Test by L.N. Dubey (2006) measured problem-solving abilities. The results indicate that while boy students showed a slightly higher mean score in problem-solving compared to girls, the difference was not statistically significant. Similarly, the study found no significant difference in problem-solving abilities between tribal and non-tribal students. However, a significant disparity emerged between government and private school students, with the latter outperforming the former. This suggests that school type and available resources play a substantial role in problem-solving skills. These findings emphasize the multifaceted nature of factors influencing problem-solving abilities among high school students and call for further exploration of the mechanisms underlying the impact of school type on these skills.

Keywords: *Problem Solving Ability, High School Students, Tribal, Non-Tribal, Gender Differences, Ranchi Town*

Problem-solving ability is a pivotal cognitive skill essential for addressing the challenges and complexities of modern life effectively. It empowers individuals to analyze situations, devise solutions, and make informed decisions, thereby impacting their personal, academic, and societal success. However, the development and expression of problem-solving abilities can vary significantly across diverse populations, influenced by an array of socio-cultural factors. In the context of Ranchi Town, situated in the culturally diverse Indian state of Jharkhand, this research embarks on a comparative investigation of problem-solving abilities among high school students. This study takes a closer look at how this critical skill differs between tribal and non-tribal students. Ranchi Town serves as an intriguing backdrop for this inquiry, given its unique demographic tapestry, where various tribal communities coexist alongside non-tribal populations.

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The motivation for this research stems from the recognition that understanding and addressing disparities in problem-solving abilities are vital for fostering educational equity and enabling all students to thrive. By focusing on tribal and non-tribal high school students in Ranchi Town, we aim to elucidate whether significant distinctions exist in their problem-solving capabilities. This study endeavors to contribute valuable insights to the fields of education, psychology, and socio-cultural studies. It seeks to unravel the intricate interplay between cultural backgrounds and cognitive development, shedding light on the factors that may shape problem-solving skills during adolescence. The findings of this research could have broader implications for educational policies and practices, with the potential to inform interventions aimed at fostering equitable educational opportunities for students from diverse backgrounds. Through a careful examination of problem-solving ability in this specific context, this research aims to enhance our understanding of how individuals from varying socio-cultural backgrounds navigate the challenges of the modern world, ultimately working towards the goal of providing a more inclusive and supportive educational environment for all high school students in Ranchi Town.

REVIEW OF LITERATURE

Lalduhawma et. al., (2023) conducted a study on Problem-solving Ability among Higher Secondary School Students in Aizawl City in Relation to Locale and Type of School Management. The study was conducted to study the problem-solving abilities among higher secondary school students in Aizawl city. The sample consists of 160 students from six different Higher Secondary Schools in Aizawl city in which three schools are Government schools and the other three are Private schools. Problem-solving ability test (PSAT) developed by L.N. Dubey was used as a tool for data collection. The findings of the study revealed that there was no significant difference between urban and rural higher secondary school students in their problem-solving abilities; and there was no significant difference between arts and commerce higher secondary school students.

Soebagyoy et al., (2022) conducted a study which aims to describe students' problem-solving abilities on social arithmetic material in terms of learning styles. The research was conducted through a descriptive qualitative research design. The population is all seventh-grade students of MTs Al-Khairiyah, South Jakarta. Sampling using a total sampling technique. Then three students were selected, namely students who scored the highest visual, auditory and kinesthetic learning styles. The instrument uses a learning style questionnaire and a test of problem-solving skills and semi-structured interviews—data analysis techniques with data reduction, exposure, and concluding to explain mathematical problem-solving abilities. The findings of this study are students with the highest scores of visual, auditory, and kinesthetic learning styles can solve social arithmetic problems based on Polya's steps without any significant differences, only from different styles when solving problems.

Ramanaiah et al., (2021) conducted a study on problem solving ability among adolescents of working and non-working mothers. The sample for the study consists of 300 tenth class students studying in rural and urban areas of Nallore district of Andhra Pradesh. Aim of the study was to assess the impact of gender, locality and work status on problem solving ability among adolescents. It was found that locality and work status have significant influence on problem solving ability. It was also found that, gender has no significant influence on problem solving ability.

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Ahdhianto et al (2020) studied to improve students' mathematical problem-solving and critical thinking skills using problem-based learning (PBL). A quasi-experimental design was used in this study which involved 78 (31 males and 47 females) fifth grade students as the sample. The students were categorized into two groups, namely the experimental group (n = 39) and the control group (n = 39). This study was conducted on an Indonesian elementary school in its first semester of the 2019/2020 school year. The Problem-Solving Skills Test (PSST) and Critical Thinking Skills Test (CTST) were employed to obtain the data. One-Way MANOVA and ANOVA tests were used to describe the data at a significance level of .05. The results revealed that students in the experimental group had higher post-test scores compared to the control group in terms of mathematical problem-solving and critical thinking skills. Thus, it is concluded that PBL effectively promoted fifth-grade students' problem-solving and critical thinking skills.

Objectives

The objectives of this research are twofold:

1. To examine the influence of gender on problem-solving ability among high school students.
2. To examine the influence of ethnicity on problem-solving ability among high school students.
3. To examine the influence of school type on problem-solving ability among high school students.

Hypotheses

To address these objectives, we formulated the following hypotheses:

1. There is no significant difference in problem-solving ability between boy and girl high school students in Ranchi Town.
2. There is no significant difference in problem-solving ability between tribal and non-tribal high school students in Ranchi Town.
3. There is no significant difference in problem-solving ability between government and private high school students in Ranchi Town.

METHODOLOGY

Participants:

The study included 80 high school students from Ranchi Town, comprising an equal number of boys and girls. The participants were selected from both tribal and non-tribal backgrounds and represented a mix of government and private schools.

Table 01 Sample Design

	Government		Private	
	Boy	Girl	Boy	Girl
Tribal	10	10	10	10
Non-tribal	10	10	10	10
Total	20	20	20	20
Total	40		40	

Instrument: To assess problem-solving ability, the Problem-Solving Ability Test developed by L.N. Dubey in 2006 was employed. This standardized test measures various aspects of problem-solving, including analytical thinking, creativity, and decision-making.

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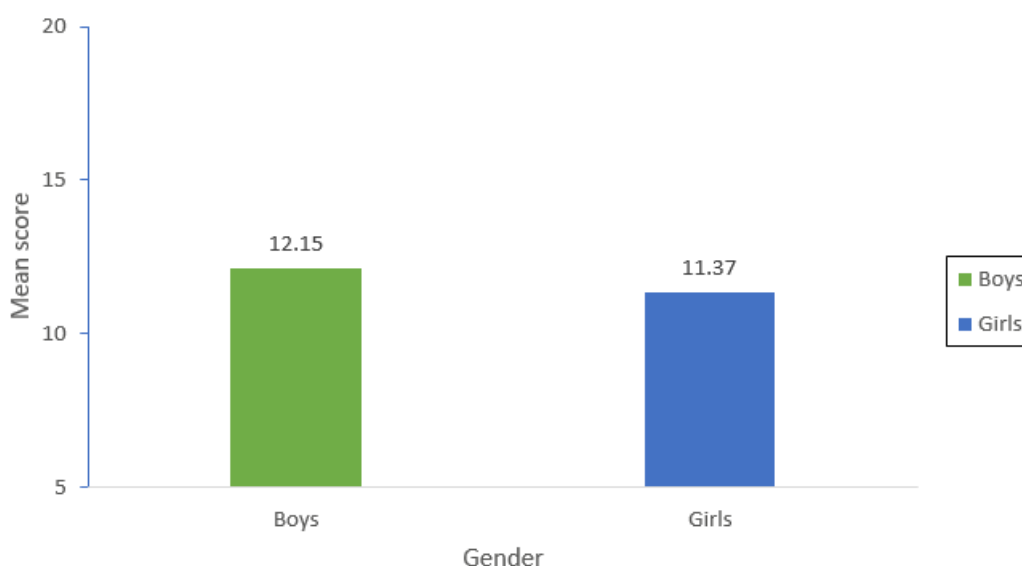
Results: The analysis revealed the following results:

Table 02 Influence of gender on problem-solving ability

Subgroups	Mean	SD	Mean difference	df	t
Boy	12.15	2.78	0.77	78	1.32 ^{NS}
Girl	11.37	2.43			

NS: Not Significant

Figure 01 Mean scores on problem solving ability among students in relation to gender



From above table and figure it is clear that, the mean scores among boy and girl students were found 12.15 and 11.37 respectively. The score of t-test was found 1.32 which is not significant. Hence the null hypothesis that, there is no significant difference in problem-solving ability between boy and girl high school students in Ranchi town, is accepted here.

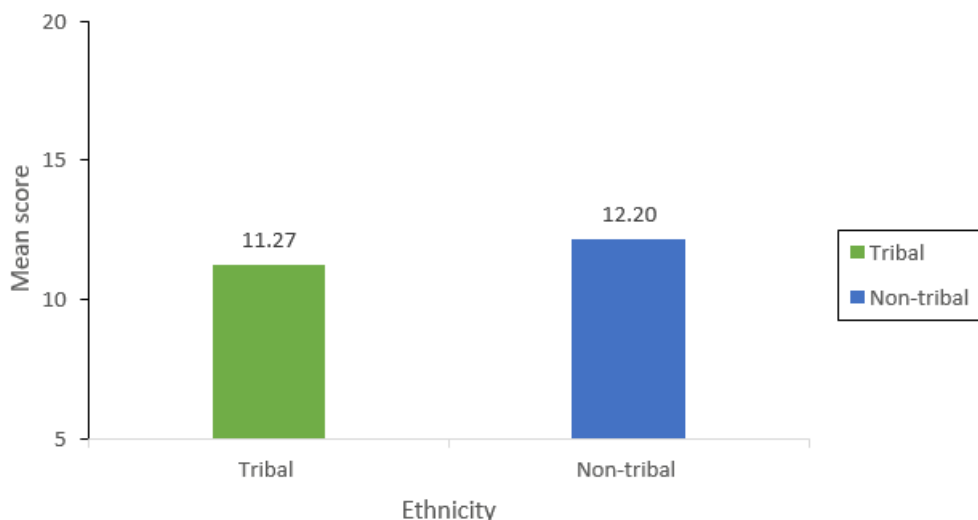
Table 03 Influence of ethnicity on problem-solving ability

Subgroups	Mean	SD	Mean difference	df	t
Tribal	11.27	2.65	0.93	78	1.58 ^{NS}
Non-tribal	12.20	2.56			

NS: Not Significant

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Figure 02 Mean scores on problem solving ability among students in relation to ethnicity



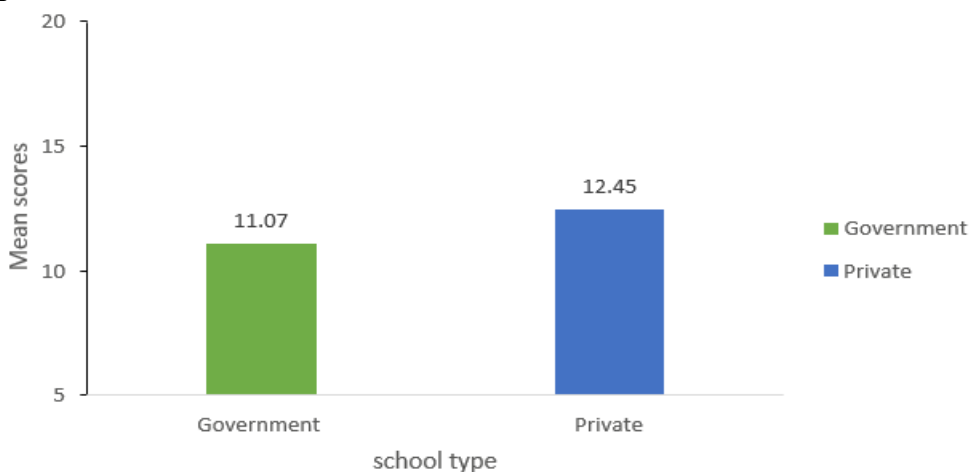
From above table and figure it is clear that, the mean scores among tribal and non-tribal students were found 11.27 and 12.20 respectively. The score of t-test was found 1.58 which is not significant. Hence the null hypothesis that, there is no significant difference in problem- solving ability between tribal and non-tribal high school students in Ranchi town, is accepted here.

Table 04 Influence of school type on problem-solving ability

Subgroups	Mean	SD	Mean difference	df	t
Government	11.07	2.68	1.37	78	2.40*
Private	12.45	2.41			

* Significant at 0.01 level

Figure 03 Mean scores on problem solving ability among students in relation to school type



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From above table and figure it is clear that, the mean scores among government and private students were found 11.07 and 12.45 respectively. The score of t-test was found 2.40 which is significant at 0.01 level. Hence the null hypothesis that, there is no significant difference in problem-solving ability between government and private high school students in Ranchi town, is rejected here.

DISCUSSION

The discussion of the results begins with an examination of the comparison between boy and girl students. The mean scores for boy and girl students, 12.15 and 11.37 respectively, suggest a slight advantage for boy students in terms of problem-solving ability. However, the t-test

score of 1.32 is not statistically significant, leading to the acceptance of the null hypothesis. This finding aligns with some previous research, which has failed to establish significant gender differences in problem-solving abilities among adolescents (Eccles, 2007). It highlights the notion that problem-solving skills may not be inherently gender-dependent but instead influenced by a complex interplay of other factors such as educational experiences and cultural context.

Similarly, when comparing tribal and non-tribal students, the mean scores of 11.27 and 12.20 respectively might suggest an advantage for non-tribal students in problem-solving. However, the t-test score of 1.58 is not statistically significant, leading to the acceptance of the null hypothesis. This result is consistent with some previous research that has found no significant differences in problem-solving abilities among students from different cultural backgrounds (Hofstede, 2011). It highlights the idea that problem-solving ability may be influenced more by individual experiences and educational factors than by cultural identity alone.

In contrast, the comparison between government and private school students reveals a significant difference in mean scores, with government school students scoring lower (11.07) than their private school counterparts (12.45). The t-test score of 2.40 is statistically significant at the 0.01 level, leading to the rejection of the null hypothesis. This finding is in line with numerous studies indicating that students in private schools tend to outperform their peers in government schools in various academic domains, including problem-solving (Chudgar & Quin, 2012). The result underscores the potential impact of school type and resources on the development of problem-solving skills among high school students.

Overall, these findings emphasize the complexity of factors that contribute to problem-solving ability among high school students. While gender and cultural background may not be significant determinants, the type of school students attend appears to have a more substantial influence. Future research could delve deeper into the specific mechanisms through which school type impacts problem-solving skills and explore potential interventions to narrow the gap between government and private school students in Ranchi Town.

Limitations

This study, while offering valuable insights into problem-solving abilities among high school students in Ranchi Town, is subject to certain limitations that affect the scope and interpretation of the findings. Firstly, the sample size of 80 participants, though

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representative of the target population, remains relatively small, potentially limiting the generalizability of the results. A larger sample size would have enhanced statistical power and result reliability. Additionally, the study focused exclusively on private and government schools in Ranchi Town, potentially excluding students from alternative educational institutions or specialized programs, which may have different problem-solving patterns. The omission of other school types is a limitation that narrows the scope of the study's conclusions. Furthermore, while the study considered tribal and non-tribal backgrounds, it did not delve into specific cultural nuances within these groups. Culture is a complex and multifaceted factor, and a more in-depth exploration could have provided a more nuanced understanding. Lastly, the study employed the Problem-Solving Ability Test as an assessment tool. While widely used, this test may have limitations in capturing the full spectrum of problem-solving skills. The use of alternative measures or a combination of assessment tools could have offered a more comprehensive evaluation.

CONCLUSION

In summary, this research has provided valuable insights into problem-solving abilities among high school students in Ranchi Town, with a particular focus on the influence of gender, ethnicity (tribal and non-tribal), and school type (government and private). The findings reveal several important patterns. Firstly, there was no significant difference in problem-solving ability between boy and girl students, challenging conventional gender stereotypes associated with cognitive skills. Similarly, the study found no significant differences in problem-solving ability between tribal and non-tribal students, indicating that cultural backgrounds alone may not dictate problem-solving skills. However, a notable disparity emerged between government and private school students, with private school students outperforming their government school counterparts. This emphasizes the critical role of educational resources and environments in nurturing problem-solving skills. In conclusion, this study underscores the complexity of factors influencing problem-solving abilities among high school students and highlights the importance of equitable access to quality education and resources. While these findings provide valuable insights, future research with larger and more diverse samples, employing a longitudinal approach, could offer deeper insights into the development and influences on problem-solving skills among adolescents. Addressing these disparities is crucial for fostering inclusive and equitable educational opportunities for all students in Ranchi Town and beyond.

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Conflict of Interest

The author(s) declared no conflict of interest.

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