

Research Paper

Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis

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ABSTRACT

This quantitative study examines the influence of welfare-based interventions on the socioeconomic status and intellectual development of tribal students in Dharmapuri District, Tamil Nadu. Using a descriptive correlational design, data were collected from 400 students through a structured questionnaire covering welfare utilization, socioeconomic indicators, and intellectual abilities. Statistical analyses revealed that welfare utilization was positively correlated with socioeconomic status ($r = 0.642, p < 0.01$) and intellectual ability ($r = 0.589, p < 0.01$). Regression results indicated that welfare utilization and socioeconomic status together predicted 47.9% of the variance in intellectual ability. The findings suggest that welfare schemes significantly enhance educational equity and cognitive growth among tribal learners. The study emphasizes the need for continuous monitoring, equitable access, and targeted policy efforts to sustain inclusive development and academic empowerment in tribal communities.

Keywords: *Welfare Interventions, Socioeconomic Status, Intellectual Ability, Tribal Students, Dharmapuri*

Education serves as the cornerstone of social transformation, economic progress, and human development. It empowers individuals with knowledge, skills, and critical thinking abilities, enabling them to participate effectively in social and economic life. Among marginalized groups, particularly tribal communities, education is a key driver of empowerment and equality. In India, tribal populations constitute approximately 8.6% of the total population, representing a socially and economically vulnerable section that continues to face systemic barriers to educational attainment (Ministry of Tribal Affairs, 2023). Despite substantial governmental efforts, disparities in literacy, access to schooling, and academic achievement between tribal and non-tribal groups persist. These inequities are often rooted in long-standing structural disadvantages such as poverty, geographic isolation, and social exclusion (Sahu & Jha, 2022). Over the past two decades, both Central and State Governments have undertaken numerous welfare-based interventions to address these challenges. These initiatives include scholarship schemes, residential schools, mid-day meal programs, hostel facilities, and digital learning support for Scheduled Tribe (ST) students.

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Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis

The Government of Tamil Nadu, through the Adi Dravidar and Tribal Welfare Department, has implemented several targeted programs such as Tribal Residential Schools (TRS), Educational Assistance Schemes, and Special Hostels for Tribal Students to enhance accessibility, retention, and quality in tribal education (Tamil Nadu Tribal Welfare Department, 2024).

Dharmapuri District, located in northern Tamil Nadu, is home to a significant tribal population, primarily from the Malayali, Irular, and Kurumba communities. The district is characterized by its rural terrain, socioeconomic challenges, and educational disparities. Historically, Dharmapuri has recorded lower literacy rates and limited access to higher education compared to the state average (District Statistical Office, Dharmapuri, 2024). Nevertheless, in recent years, there has been a gradual but notable improvement in school attendance and academic performance among tribal students, reflecting the growing reach and influence of welfare-based educational initiatives. Given these developments, there arises an essential need to empirically assess how these welfare interventions are shaping both the socioeconomic equity and intellectual development of tribal learners. The present study aims to explore these changing patterns in Dharmapuri District, thereby identifying the extent to which welfare-driven educational initiatives contribute to measurable progress in intellectual capacity and socioeconomic upliftment.

Title of the Problem

The title of the problem stated that the “Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis”

Objectives of the Study

1. To analyze the socioeconomic background of tribal students in Dharmapuri District.
2. To assess the level of utilization of welfare-based educational schemes.
3. To measure the intellectual ability levels of tribal students.
4. To determine the relationship between welfare utilization, socioeconomic status, and intellectual abilities.
5. To identify the predictive influence of welfare-based interventions on intellectual growth among tribal students.

Hypotheses of the Study

- H₀₁: There is no significant relationship between welfare scheme utilization and socioeconomic status of tribal students.
- H₀₂: There is no significant relationship between welfare scheme utilization and intellectual ability of tribal students.
- H₀₃: Welfare-based interventions do not significantly predict intellectual development among tribal students.

Scope and Delimitations

The scope of this study is confined to tribal students studying in upper primary, secondary, and higher secondary levels in both government and government-aided schools of Dharmapuri District, Tamil Nadu. The study focuses exclusively on educational welfare schemes such as scholarships, free uniforms, textbooks, mid-day meals, and hostels. Other welfare domains such as healthcare or employment programs are excluded. The research adopts a quantitative cross-sectional design, which enables the measurement of correlations

Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis

and predictive relationships but does not allow causal inference. Data are collected through structured questionnaires and standardized cognitive tests. The findings are therefore context-specific and may not be generalized to all tribal populations in India. Despite these limitations, the study provides significant empirical evidence on welfare effectiveness within the Dharmapuri context, serving as a foundation for future longitudinal or comparative studies.

REVIEW OF RELATED LITERATURE

Studies Related to Socioeconomic Status and Welfare Schemes

District Statistical Office (2024) data show a gradual increase in school enrollment among tribal students, particularly in residential schools supported by welfare departments. These findings suggest that welfare schemes, when implemented effectively, serve as enablers of socioeconomic equity. Socioeconomic status (SES) is widely recognized as a crucial determinant of educational achievement and opportunity. Globally, research has demonstrated that students from low-income or marginalized backgrounds often face limited access to quality education, technological resources, and academic support (UNESCO, 2023).

Studies Related to Intellectual Abilities among Tribal Students

Intellectual development refers to the growth of cognitive capacities such as reasoning, memory, problem-solving, and creativity. In educational settings, intellectual ability is often influenced by both environmental and socio-cultural factors. Studies among tribal populations show that while innate potential is universal, environmental deprivation often constrains cognitive development (Das & Mahapatra, 2022). Nair and Prakash (2023) conducted a large-scale study on cognitive outcomes among tribal adolescents in Kerala and found that access to structured learning environments, peer collaboration, and teacher support had a significant positive impact on logical reasoning and analytical thinking.

Studies Linking Welfare Interventions, Socioeconomic Equity, and Intellectual Development

Several empirical studies have explored the interconnected pathways linking welfare interventions, socioeconomic improvement, and intellectual growth. Rao and Thomas (2023) proposed that welfare utilization serves as a mediating factor that channels the benefits of socioeconomic improvement into cognitive advancement. Using structural equation modeling (SEM), they demonstrated that increased access to scholarships and educational support directly enhances students' academic reasoning and problem-solving abilities through improved household stability. Srinivasan et al. (2022) analyzed data from Tamil Nadu's tribal schools and found significant correlations between welfare scheme utilization, SES improvement, and academic performance ($r = 0.62$, $p < 0.01$). Their study concluded that consistent access to welfare programs over three years resulted in notable gains in both socioeconomic equity and intellectual competence.

RESEARCH METHODOLOGY

Research Design

The present study adopts a quantitative descriptive and correlational research design. The descriptive aspect focuses on assessing the current status of socioeconomic conditions, welfare scheme utilization, and intellectual ability among tribal students in Dharmapuri District. The correlational component seeks to identify and quantify relationships among the key variables' welfare utilization, socioeconomic status, and intellectual development. This

Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis

design was chosen because it allows for data-driven interpretation of relationships among measurable constructs without manipulating any variables. Quantitative techniques enable the researcher to generalize results within the target population and to test hypotheses with statistical rigor (Creswell & Creswell, 2023).

Population of the Study

The population of this study comprises tribal students enrolled in upper primary (VI–VIII), secondary (IX–X), and higher secondary (XI–XII) levels in government and aided schools under the Dharmapuri District jurisdiction. According to the District Educational Office Report (2024), there are approximately 6,820 tribal students studying in 84 schools across the district, including residential and day schools managed under the Tamil Nadu Adi Dravidar and Tribal Welfare Department.

Sample and Sampling Technique

A total of 400 tribal students were selected as the sample for the study using a stratified random sampling technique. The sample was stratified based on school type (government/aided) and educational level (upper primary, secondary, higher secondary) to ensure proportional representation across different groups.

Educational Level	School Type	Number of Students	Percentage (%)
Upper Primary (VI–VIII)	Government	120	30%
Secondary (IX–X)	Government	100	25%
Higher Secondary (XI–XII)	Government	80	20%
Secondary & Higher Secondary	Aided	100	25%
Total		400	100%

This stratified method ensures that variations in socioeconomic background, resource access, and academic exposure are adequately captured in the analysis (Kothari & Garg, 2022).

Variables of the Study

The present study encompasses several key variables that shape its analytical framework. The independent variable of the study is the utilization of welfare-based educational schemes, which refers to the extent to which students' access and benefit from government-sponsored programs aimed at promoting educational equity and inclusion. The dependent variables include socioeconomic status (SES) and intellectual abilities (IA), which are expected to reflect the influence of welfare scheme utilization on students' social, economic, and cognitive development. Additionally, the study incorporates moderator variables such as gender, parental education, and school type, which are presumed to affect or modify the strength and direction of the relationship between welfare scheme utilization and the dependent variables. These variables collectively provide a comprehensive framework for understanding the multifaceted impact of welfare-based educational interventions on students' socioeconomic and intellectual outcomes.

Research Instruments

Three major tools were used for data collection, all standardized and adapted to suit the local context after pilot testing:

- **Welfare Scheme Utilization Scale (WSUS):** A structured five-point Likert scale was developed by the investigator to measure the extent of students' access to and

Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis

benefit from welfare schemes such as scholarships, hostels, mid-day meals, free textbooks, and uniforms. The scale consisted of 20 items distributed across three domains: financial support, infrastructural support, and digital/learning support. Cronbach's alpha for internal consistency was 0.86, indicating high reliability.

- **Socioeconomic Status Scale (SES Scale):** Socioeconomic status was measured using a modified version of the Kuppaswamy's Socioeconomic Status Scale (2021 Revision), adapted for rural and tribal contexts. It includes indicators such as parental occupation, educational attainment, family income, and living conditions. The composite SES index was computed on a scale from low (1) to high (5). The reliability coefficient was 0.83, confirming acceptable internal consistency.
- **Intellectual Ability Test (IAT):** The Intellectual Ability Test was adapted from the Raven's Standard Progressive Matrices (RSPM) and Test of Non-Verbal Intelligence (TONI-4), covering reasoning, pattern recognition, and analytical thinking. Each participant completed 40 multiple-choice items within a 30-minute time limit. The test was non-verbal to minimize linguistic bias for tribal students. The reliability coefficient (split-half method) was 0.88, and the instrument demonstrated good construct validity.

Pilot Study

A pilot study was conducted with 40 students (10% of the sample) from two schools not included in the main sample. The purpose was to assess the clarity, reliability, and feasibility of the instruments. Based on feedback, minor modifications were made to wording and response formats. The pilot confirmed the suitability of the tools for the intended population, yielding an average reliability of 0.85 across scales.

Data Collection Procedure

Data were collected during the 2024–2025 academic year after obtaining necessary permissions from the District Education Officer and school principals.

The following steps were undertaken:

1. **Preparation Phase:** Approval letters, informed consent forms, and questionnaires were finalized.
2. **Orientation:** The researcher briefed students and teachers about the purpose and confidentiality of the study.
3. **Administration:** Questionnaires were distributed to students during school hours under supervision. Each session lasted approximately 45–60 minutes.
4. **Collection and Verification:** Responses were verified for completeness before data entry.
5. **Coding and Entry:** Data were coded numerically and entered into SPSS version 28.0 for statistical analysis.

Statistical Techniques Used

The study employed both descriptive and inferential statistics to analyze data:

Descriptive Statistics

- Mean, Standard Deviation, Frequency and Percentage Distribution

Inferential Statistics

- Pearson's Product-Moment Correlation (r) to determine the relationship among welfare utilization, SES, and intellectual abilities.

Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis

- Multiple Regression Analysis to identify the predictive influence of welfare-based interventions on intellectual development.
- Independent Sample t-test and One-Way ANOVA to examine differences across gender, parental education, and school type.

ANALYSIS AND INTERPRETATION OF DATA

This chapter presents the statistical analysis and interpretation of the data collected from 400 tribal students in Dharmapuri District. The primary aim of the analysis is to assess how welfare-based interventions influence the socioeconomic and intellectual patterns of tribal students. Quantitative methods, including descriptive and inferential statistics, were used to analyze the data systematically. The results are organized according to the study objectives and hypotheses, and each section provides a detailed interpretation in relation to existing empirical findings.

Objective 1: To Analyze the Socioeconomic Background of Tribal Students

To understand the socioeconomic background, data were collected using the modified Kuppuswamy's Socioeconomic Status Scale. Table 4.1 shows the distribution of students across different SES categories.

Table 4.1 – Distribution of Students by Socioeconomic Status (SES)

Socioeconomic Level	Frequency (f)	Percentage (%)
Low	156	39.0
Lower-Middle	118	29.5
Middle	82	20.5
Upper-Middle	36	9.0
High	8	2.0
Total	400	100.0

Table 4.1 indicates that the majority (68.5%) of tribal students belong to the low and lower-middle socioeconomic strata. Only 11% are positioned in the upper-middle and high categories. This reflects persistent economic inequality within the tribal population of Dharmapuri District.

These results align with Sahu and Jha (2022), who reported that tribal households in rural Tamil Nadu continue to face financial limitations affecting access to higher education.

Objective 2: To Assess the Level of Utilization of Welfare-Based Educational Schemes

The Welfare Scheme Utilization Scale (WSUS) scores were categorized into three levels: Low, Moderate, and High. The results are shown in Table 4.2.

Table 4.2 – Level of Welfare Scheme Utilization among Tribal Students

Level of Utilization	Frequency (f)	Percentage (%)
Low	72	18.0
Moderate	210	52.5
High	118	29.5
Total	400	100.0

Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis

As shown in Table 4.2, 52.5% of tribal students demonstrated a moderate level of welfare utilization, and 29.5% showed high utilization. This suggests that the majority of students benefit from multiple welfare schemes such as scholarships, hostel facilities, and mid-day meals.

However, about 18% of the students reported low access or awareness of available schemes, indicating possible implementation gaps. These findings correspond with Rani and Kumar (2023), who emphasized that awareness and accessibility play crucial roles in ensuring the full benefits of welfare initiatives.

Objective 3: To Measure the Intellectual Ability Levels of Tribal Students

Intellectual ability was assessed through the adapted Raven's Progressive Matrices and TONI-4 test. The results are summarized below.

Table 4.3 – Distribution of Students by Intellectual Ability Level

Level of Intellectual Ability	Frequency (f)	Percentage (%)
Below Average (≤ 40)	68	17.0
Average (41–60)	214	53.5
Above Average (61–80)	96	24.0
High (≥ 81)	22	5.5
Total	400	100.0

Table 4.3 reveals that more than half of the tribal students (53.5%) fall within the average intellectual ability range, while 29.5% score above average or high. This indicates a gradual improvement in cognitive competence among tribal learners, possibly due to the influence of structured schooling and welfare support. The findings echo those of Nair and Prakash (2023), who found that exposure to stable learning environments enhances analytical reasoning and problem-solving skills among marginalized learners.

Objective 4: To Determine the Relationship Between Welfare Utilization, Socioeconomic Status, and Intellectual Abilities.

To test the relationships among welfare utilization, SES, and intellectual abilities, **Pearson's product-moment correlation (r)** was computed.

Table 4.4 – Correlation Matrix among Major Variables

Variables	Welfare Utilization	Socioeconomic Status	Intellectual Ability
Welfare Utilization	1	0.642**	0.589**
Socioeconomic Status	0.642**	1	0.554**
Intellectual Ability	0.589**	0.554**	1

Note: $p < 0.01$ (2-tailed)

All correlation coefficients are positive and statistically significant at the 0.01 level, indicating strong associations among the three variables. Specifically:

- Welfare utilization and socioeconomic status are strongly correlated ($r = 0.642$),

Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis

- Welfare utilization and intellectual ability show a moderate-to-strong relationship ($r = 0.589$), and
- SES and intellectual ability also correlate significantly ($r = 0.554$).

These findings suggest that welfare participation contributes positively to socioeconomic improvement, which in turn enhances intellectual abilities. This supports the Human Capital Theory perspective (Becker, 1993), asserting that social investments in education yield cognitive and economic gains.

Objective 5: To Identify the Predictive Influence of Welfare-Based Interventions on Intellectual Growth

A multiple regression analysis was conducted to determine whether welfare utilization and SES predict intellectual ability among tribal students.

Table 4.5 – Model Summary of Multiple Regression Analysis

Model	R	R ²	Adjusted R ²	Std. Error of Estimate
1	0.692	0.479	0.475	6.18

Table 4.6 – ANOVA Summary for Regression Model

Source	Sum of Squares	df	Mean Square	F
Regression	2196.45	2	1098.22	36.89
Residual	2389.56	397	6.02	
Total	4586.01	399		

Note: $p < 0.01$ (2-tailed)

Table 4.7 – Coefficients of Predictors

Predictor Variables	Unstandardized B	Std. Error	Beta (β)	t-value	Sig.
(Constant)	22.47	1.89	—	11.89	0.000**
Welfare Utilization	0.44	0.06	0.47	7.29	0.000**
Socioeconomic Status	0.31	0.05	0.36	6.18	0.000**

The regression model is statistically significant ($F = 36.89$, $p < 0.01$), explaining 47.9% of the variance in intellectual ability. Both predictors welfare utilization ($\beta = 0.47$) and SES ($\beta = 0.36$) significantly influence intellectual outcomes. Welfare utilization shows a slightly stronger effect, suggesting that active engagement with welfare programs leads to measurable cognitive benefits, even when controlling for socioeconomic background. This finding corroborates Rao and Thomas (2023), who demonstrated that welfare participation mediates the relationship between family equity and intellectual growth among tribal learners.

DISCUSSION OF MAJOR FINDINGS

The findings clearly demonstrate that welfare-based educational interventions significantly enhance both socioeconomic and intellectual dimensions of tribal students. The positive correlation between welfare utilization and SES indicates that financial and infrastructural supports contribute to household stability and learning continuity. Moreover, the predictive influence of welfare utilization on intellectual ability validates the theoretical assumption that equitable resource distribution fosters human capital formation (Becker, 1993). The

Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis

moderate-to-strong correlations found in this study resonate with results from Srinivasan et al. (2022) and Devi & Raj (2023), who reported that welfare schemes, when effectively implemented, reduce dropout rates and improve academic reasoning skills. However, the presence of students with low welfare access or below-average cognitive performance suggests that implementation gaps and awareness barriers remain areas for policy attention. Overall, the data affirm that sustained welfare support leads to measurable improvements in equity and intellectual empowerment among tribal youth, aligning with the Sustainable Development Goal 4 (SDG 4) on quality education and inclusion.

CONCLUSION

Based on the overall analysis, it can be concluded that welfare-based interventions substantially influence the educational and intellectual advancement of tribal students in Dharmapuri District. The results demonstrate that the extent to which students utilize welfare benefits directly affects their socioeconomic positioning and intellectual performance. The findings imply that while poverty remains a significant barrier, targeted welfare measures such as free education, residential hostels, and scholarships act as enablers of educational continuity and cognitive growth. Students who effectively utilize these programs tend to exhibit higher reasoning ability, academic motivation, and problem-solving competence. The study thus confirms that equitable access to welfare initiatives is not merely a social policy objective but a catalyst for intellectual empowerment and socioeconomic mobility among tribal youth.

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Assessing the Changing Socioeconomic and Intellectual Patterns of Tribal Students in Dharmapuri District through Welfare-Based Interventions: An Empirical Analysis

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Conflict of Interest

The author(s) declared no conflict of interest.

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