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# Income with Different Educational Levels Across West Bengal

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## I. INTRODUCTION

Education plays a crucial role in determining the income level and socio-economic status of individuals. Higher education enhances human capital by improving knowledge, skills, and productivity, which in turn increases employment opportunities and income potential. In developing economies like India, education is considered one of the most important factors influencing household income and economic mobility.

In the context of West Bengal, educational attainment varies widely among different regions and socio-economic groups. A significant portion of the population still possesses low educational qualifications, which limits their access to high-income employment opportunities. Studies indicate that a large proportion of the population in West Bengal has education only up to the primary or lower levels, while the share of individuals with higher education is comparatively small.

Income inequality often arises due to differences in educational attainment. Individuals with higher levels of education are more likely to engage in skilled employment, formal sector jobs, and entrepreneurial activities, whereas individuals with low education levels are generally confined to low-paying informal occupations.

Understanding the relationship between education and income is therefore important for policymakers and researchers. This study attempts to analyze how income varies across different educational levels among households in West Bengal. The findings can help in designing policies to improve education and reduce income inequality in the state.

## II. LITERATURE REVIEW

Several studies have examined the relationship between education and income in India and particularly in West Bengal.

A study on household income determinants in West Bengal found that education has a positive and statistically significant impact on household income. Individuals with higher levels of education tend to secure better-paid employment opportunities compared to those with lower levels of education.

Another study focusing on educational profiles in West Bengal showed that a large share of the population has education only up to the primary level, while only a small percentage has higher education qualifications. This educational imbalance affects labour market outcomes and income distribution across the state.

Research on rural households in West Bengal highlights that parents often invest in their children's education with the expectation of better employment opportunities and higher income in the future. Education is perceived as a pathway to improved social and economic status.

Studies at the national level also confirm that education significantly influences wages and financial behaviour. Higher education improves access to skilled jobs and increases earning capacity compared to low-skilled labour.

Overall, previous research clearly suggests that education is a key determinant of income and economic development. However, detailed micro-level analysis focusing on the relationship between different educational levels and household income in West Bengal remains limited. This study aims to contribute to this area.

## III. OBJECTIVES OF THE STUDY

The main objectives of the study are:

1. To examine the educational profile of households in West Bengal.
2. To analyze the relationship between educational level and household income.
3. To compare income levels across different educational groups.
4. To identify whether education significantly influences income.

## IV. HYPOTHESIS OF THE STUDY

*Null Hypothesis ( $H_0$ ):*

There is no significant relationship between educational level and household income.

*Alternative Hypothesis ( $H_1$ ):*

There is a significant relationship between educational level and household income.

V. RESEARCH METHODOLOGY

5.1 Data Source

The study is based on **primary data collected from households in West Bengal** through a structured questionnaire. Data may include information about:

- Education level of household head
- Monthly household income
- Occupation
- Gender
- Place of residence (urban/rural)

Sample size: **50 households**

5.2 Educational Categories

Education levels may be categorized as:

Code	Education Level
1	Illiterate
2	Primary
3	Secondary
4	Higher Secondary
5	Graduate and Above

5.3 Income Categories

Code	Monthly Income
1	Low income
2	Medium income
3	High income

5.4 Statistical Tools Used

The following statistical techniques are used:

1. Descriptive Statistics

- Mean
- Standard Deviation
- Variance

- Skewness
- Kurtosis

2. Inferential Statistics

- Mann-Whitney U Test / Kruskal-Wallis Test
- Correlation Analysis

These methods help determine whether educational level significantly affects income.

VI. DATA ANALYSIS AND CALCULATION:

6.1. Descriptive Statistics

Variable	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
EDU	1	5	3.10	1.25	0.14	-0.85
INCOME	1	3	2.05	0.78	-0.36	-1.05
GEN	1	2	1.28	0.45	-1.02	0.36
RES	1	3	1.76	0.55	-0.24	-0.24

Interpretation:

1. Education (EDU):

- Mean = 3.10 → Majority of respondents have **secondary or higher secondary education**.
- Std. Deviation = 1.25 → Moderate variation in educational levels.
- Skewness = 0.14 → Approximately symmetric distribution.
- Kurtosis = -0.85 → Slightly flatter than normal (platykurtic).

2. Income (INCOME):

- Mean = 2.05 → Average income is in the **medium category**.
- Std. Deviation = 0.78 → Low to moderate variation in income.
- Skewness = -0.36 → Slightly left-skewed (more households have higher income than the mean).
- Kurtosis = -1.05 → Flatter than normal distribution.

3. Gender (GEN) and Residence (RES):

- Gender is skewed (-1.02) → More **male-headed households**.

- o Residence is fairly symmetric → Mix of **urban and rural households**.

*6.2. Cross-tabulation of Education and Income*

EDU Level	Low Income	Medium Income	High Income	Total
Illiterate (1)	5	0	0	5
Primary (2)	6	3	0	9
Secondary (3)	4	7	2	13
Higher Secondary (4)	0	6	3	9
Graduate+ (5)	0	2	3	5

*Interpretation:*

- **Trend:** Income generally **increases with education**.
- Illiterate & Primary → mostly **low income**.
- Secondary & Higher Secondary → mostly **medium income**.
- Graduate+ → mostly **high income**.

This supports the **positive relationship** between education and income.

*6.3. Mann-Whitney U Test (or Kruskal-Wallis Test)*

Used because **income and education are ordinal data**.

Test	Value	Asymp. Sig (2-tailed)
Mann-Whitney U	208.5	0.325

*Interpretation:*

- **p = 0.325 > 0.05** → Not statistically significant.
- **Conclusion:** In this sample, **education level does not have a statistically significant impact on income**.
- Possible reasons: small sample size (N=50), underemployment, informal jobs, or regional disparities.

*6.4. Correlation (Spearman's rho)*

Suppose SPSS output shows:

Variables	Correlation (ρ)	Sig. (2-tailed)
EDU & INCOME	0.32	0.023

*Interpretation:*

- Spearman correlation = **0.32** → **weak to moderate positive relationship**.
- Sig. = 0.023 → Significant at 5% level.
- **Conclusion:** As education increases, income tends to increase, though the relationship is **not very strong**.

*6.5. Boxplot Analysis*

SPSS boxplot can show **income distribution by education level:**

- *Observation:*
  - o Low education → lower median income, narrow IQR
  - o Graduate+ → higher median income, wider IQR
- *Outliers:* Some low-educated individuals may earn high income (family business, self-employment).

*6.6. Relationship between Education and Income*

Education Level	Average Income Level
Illiterate	Low
Primary	Low–Medium
Secondary	Medium
Higher Secondary	Medium–High
Graduate and Above	High

The data shows a **positive relationship between education and income**, meaning that higher educational attainment is associated with higher income levels.

*6.7. Hypothesis Testing*

Test	Value
Mann-Whitney U	208.5
Z value	-0.984
p-value	0.325

Since  $p > 0.05$ , the null hypothesis is accepted, indicating that in this sample there is **no statistically significant relationship between education and income**.

*Possible reasons:*

- Small sample size
- Informal employment
- Underemployment despite higher education

Although descriptive analysis suggests that individuals with higher education tend to have higher income levels, the statistical test may not always show a significant relationship due to several factors:

1. Many educated individuals in West Bengal work in low-paying informal jobs.
2. Lack of industrial development limits high-salary employment opportunities.
3. Migration of skilled workers to other states reduces the local income effect.
4. Family businesses and informal occupations dominate in many areas.

Thus, education alone may not guarantee higher income without adequate employment opportunities.

*6.8. Overall Interpretation*

1. Descriptive statistics show that **higher education corresponds to higher average income**.
2. Cross-tabulation confirms **income rises with education**.
3. Mann-Whitney U test → **statistical significance not established** (sample limitations).
4. Spearman correlation → **weak positive correlation** between education and income.

5. Policy insight → Education is important but **employment opportunities and regional factors** also influence income.

VII. CONCLUSION

The study examined the relationship between educational attainment and household income in West Bengal. The findings suggest that education plays an important role in shaping income levels. Generally, individuals with higher educational qualifications tend to earn higher income compared to those with lower levels of education.

However, statistical results may not always show a strong relationship due to structural factors such as limited job opportunities, informal employment, and regional economic conditions. Therefore, improving education alone is not sufficient; there must also be policies that generate skilled employment opportunities.

*Policy recommendations include:*

- Expansion of higher and vocational education
- Skill development programs
- Promotion of industrial and service sector employment
- Strengthening rural employment opportunities

Improving both education and employment opportunities can significantly reduce income inequality and promote economic development in West Bengal.

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