

# **Title: *The Interdependence of Income with Education Levels***

## **Introduction and Background ( $\leq 200$ words)**

Most criteria for economic and social development assessment stem from two main factors: individual income along with education level achievements. Research documents reveal that longer years of education produce greater financial success in the future. The analysis relies on dataset information from The World Bank and Kaggle spanning from 2016 to 2024 to study this connection. Through Python data analytics users obtain analytical tools which run statistical tests and produce visualizations to monitor education-related income statistics within various temporal intervals across specific regions. The research analyzes salary correlations with educational degrees to identify the stage where additional studies lose their financial benefits. Students collaborate with professionals and educators as well as policymakers to establish research-based data which determines educational funding allocation.

## **The Hypothesis ( $\leq 200$ words)**

The attainment of higher education directly leads to better possibilities for increased earnings. The attainment of advanced degrees by individuals lets them follow better career paths that leads to higher salary levels.

A statistical analysis demonstrates that income and education level do not show any connection to one another.

A higher education level of individuals leads to improved salary amounts according to the alternative hypothesis.

Specifically, the study examines whether there is a point where further education beyond postgraduate studies does not result in increased income. The research evaluates its research inquiries by combining worldwide income data and education level measurement databases alongside scatter plot and heatmap visualizations.

## The Analysis and the Implication ( $\leq 300$ words)

### Analysis:

We analyzed datasets from the World Bank and Kaggle, filtering for 2016–2024. Key steps included:

1. **Data Cleaning:** Removed incomplete entries to focus on education levels (Middle School to PhD) and regional income (in CAD).
2. **Visualization:**
  - a. **Line Graphs:** Showed income progression across education levels by region.
  - b. **Heatmaps:** Highlighted regional disparities (e.g., North America vs. Africa).
3. **Statistical Tests:** Pearson's correlation and ANOVA confirmed a significant relationship ( $p < 0.05$ ).

### Implication:

The data supports our hypothesis but reveals nuances:

- Income rises sharply from high school to bachelor's degrees but plateaus for PhDs in some regions.

- Regional differences are stark (e.g., PhD holders in North America earn ~90,000 CAD vs. 27,000 CAD in Africa).

These findings suggest:

- Policymakers should prioritize equitable access to education.
- Individuals should weigh the ROI of advanced degrees.

## Conclusion ( $\leq$ 200 words)

The research shows that education increases earnings however the financial rewards decrease at each successive higher educational level. The existing regional economic inequalities demand that educational investments be focused on specific geographic areas.

Future research could:

A research investigation needs to examine the income differences between students who study STEM subjects compared to those who focus on humanities.

Research teams should define distinct educational markers to identify when additional academic advancement stops producing income growth.

The project provides full visibility of its code repository alongside data sources and visualizations that reside on GitHub for additional research purposes.

## References

1. Kaggle Dataset: [Education Statistics](#)
2. World Bank: [Education Data](#)
3. GitHub Repository: [CS-2704 Project](#)

