





Komal Sammita



Raima Jamil



James Anglim

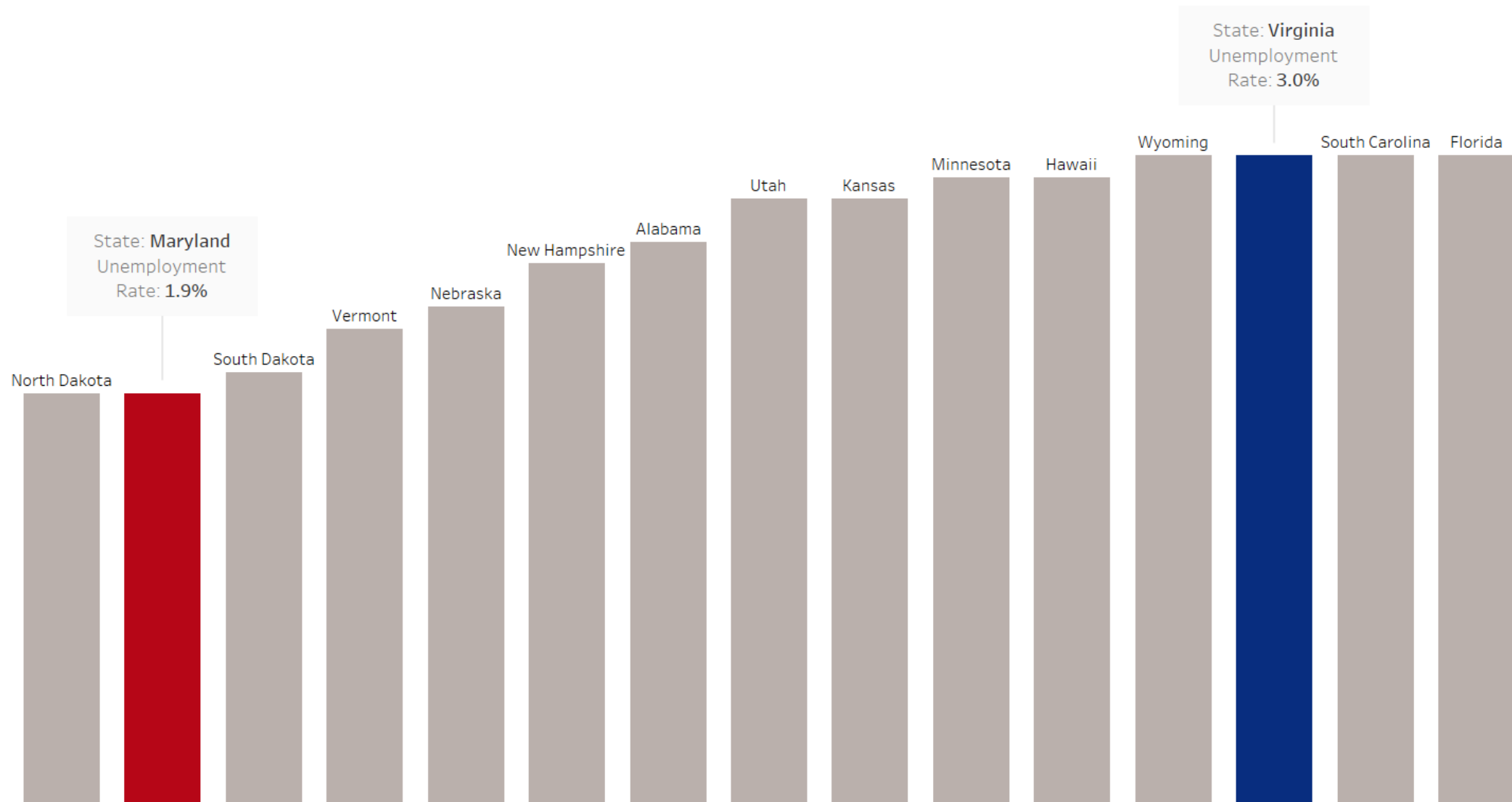


Yaw Obeng



Samariddin Zarifov

Top 10 States with the Lowest Unemployment Rate (Dec 2023)



Is Low Unemployment Good?

The short answer: usually, yes

3-5% is healthy

Below 3% can be indicative of
economic problems

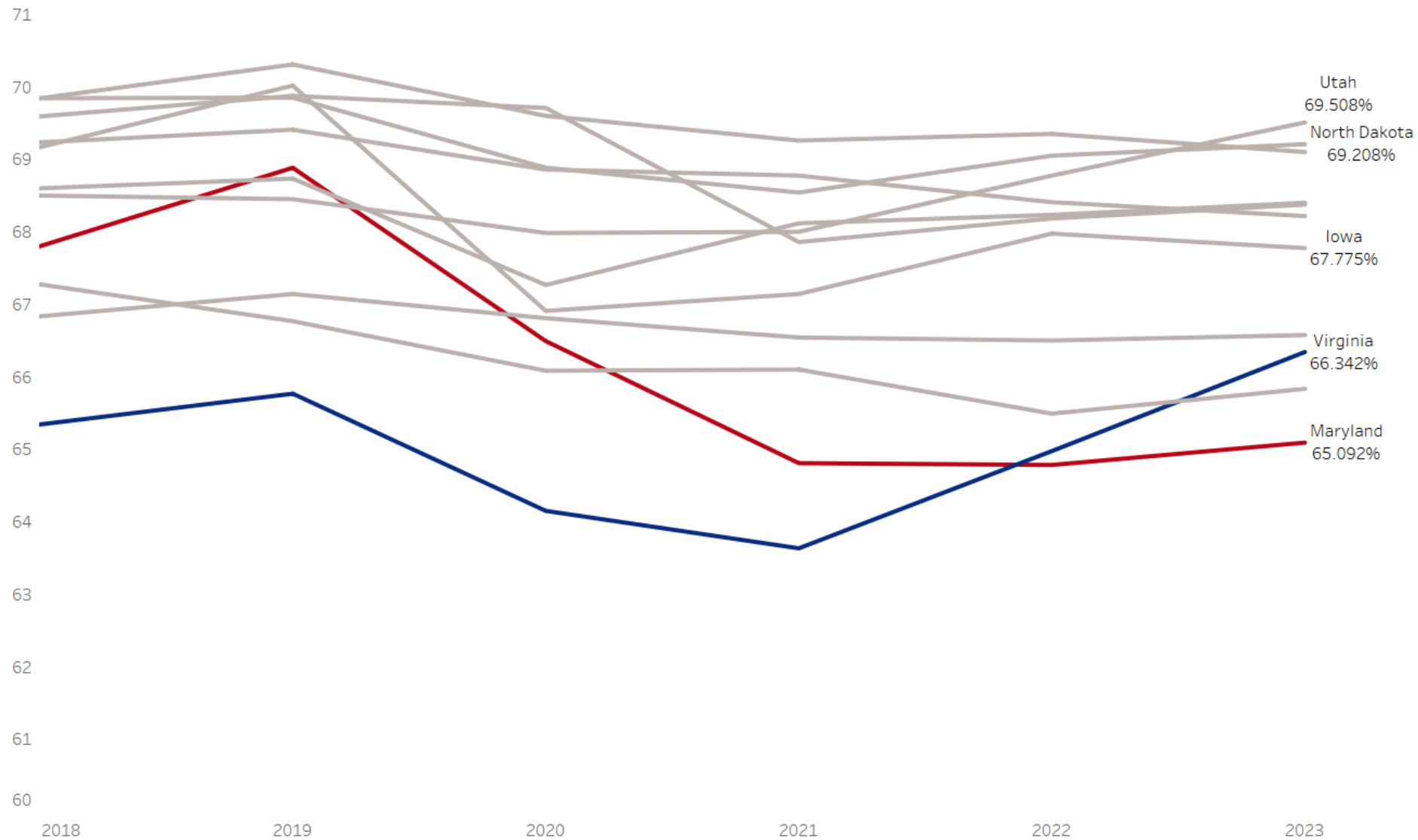


Inflation

Reduced
productivity

$$\text{Labor Force Participation Rate} = \frac{\text{Employed} + \text{Unemployed people}}{\text{Working Age Population}}$$

States with the Highest Labor Force Participation Rate (2023)



On a county-wide level, what factors significantly affect labor force participation, and how can they be used to boost the workforce?

The Data

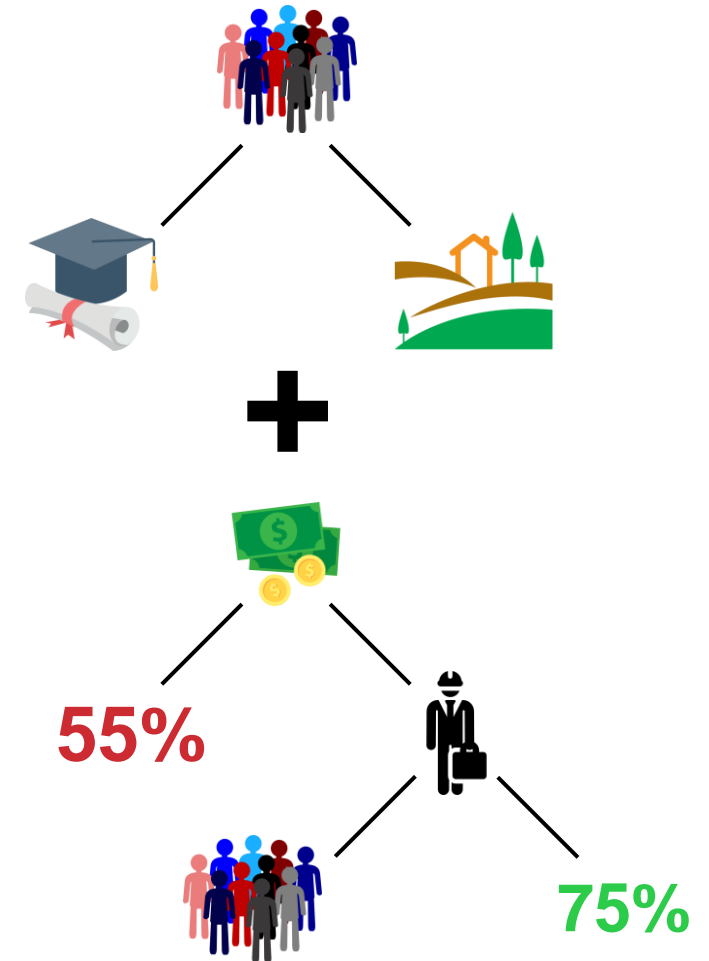
- Examined 8 datasets
 - Filtered data to Virginia counties in 2023
- Extracted the following predictors:
 - Age buckets (ranging from 15 yrs. to 79 yrs.)
 - Ethnic populations
 - Degrees/Professional Certifications
 - Rurality/Urbanity
 - Wages
- Missing data was simulated via projection/imputation



The Model

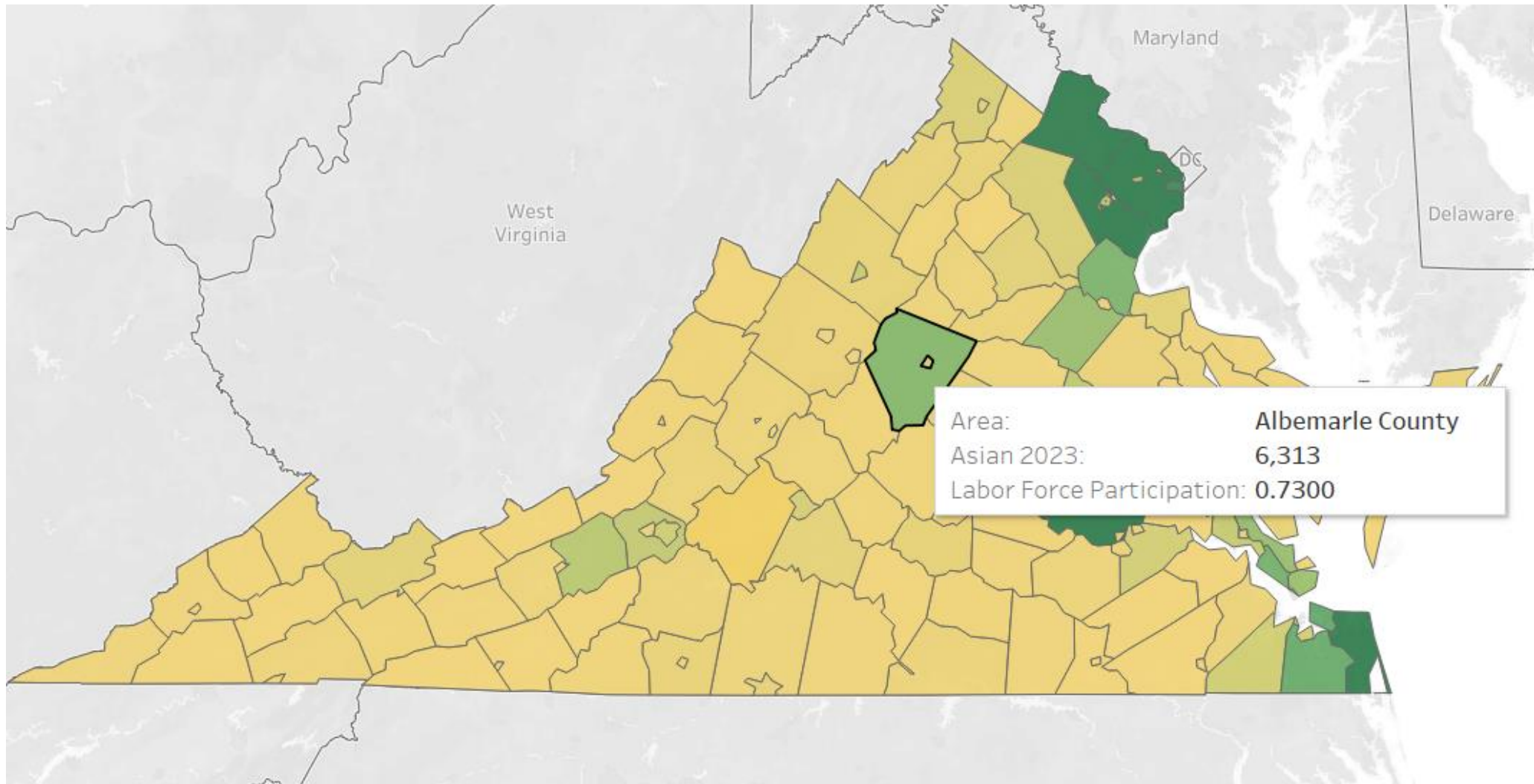
A gradient boosting machine (GBM) was used to predict labor force participation rate and help extract useful predictors

GBMs are powerful in accounting for non-linear patterns and offer higher predictive accuracy than rival machine learning algorithms





Virginia Counties and their Asian Populations (2023)



Underrepresented Population – The Solution

1. Encourage areas to become “Certified Welcoming” cities like Roanoke (Dillon, 2024)
2. Remove immigration-related barriers to obtaining professional licenses (Figueroa & Hinh, 2022)
3. Investment in training for in-demand sectors and apprenticeship opportunities

Goal: Promote inclusivity for immigrant and underrepresented communities in Virginia



An increase in Associate's Degrees results in a decrease in labor force participation

Why?

Associate's Degrees

- Most employers require a bachelor's degree as the minimum level of education
 - “Paper ceiling” effect
- People with an associate's degree could be discouraged at having no job prospects and leave the work force
- Virginia recently removed degree requirements for certain government positions, but this is not the case for the private sector (Debroy & Corcoran de Castillo, 2023)

Associate's Degree – The Solution

1. Incentivize companies to hire those with associate's degrees through tax breaks and subsidies
2. Offer upskilling programs, especially in fields such as health and legal services
3. Offer stackable credentials at state institutions, allowing students to apply credits from an associate's degree to a bachelor's degree (Salisbury, 2021)

Goal: Boost labor force participation by removing barriers to entry and help workers gain additional skills

References

- Debroy, P., & Corcoran de Castillo, B. (2024, January 17). States are leading the way in tearing the “paper ceiling” and making good jobs available to workers without degrees. Brookings. <https://www.brookings.edu/articles/states-are-leading-the-way-in-tearing-the-paper-ceiling-and-making-good-jobs-available-to-workers-without-degrees/>
- Dillon, K. (2024, February 20). Roanoke becomes first “certified welcoming” city in Virginia for immigrant inclusion policies. <https://www.wdbj7.com>. <https://www.wdbj7.com/2024/02/20/roanoke-becomes-first-certified-welcoming-city-virginia-immigrant-inclusion-policies/>
- Figueroa, E., & Hinh, I. (2022, April 12). More states adopting inclusive policies for immigrants. Center on Budget and Policy Priorities. <https://www.cbpp.org/blog/more-states-adopting-inclusive-policies-for-immigrants>
- Salisbury, A. D. (2021, March 1). Building equitable upskilling programs: It’s not degree vs. short credentials - it’s both. Forbes. <https://www.forbes.com/sites/allisondulinsalisbury/2021/03/01/building-equitable-upskilling-programs-its-not-degree-vs-short-credentials---its-both/?sh=796b13896079>

Datasets

DOE Total Passed 2021-2022:

<https://data.virginia.gov/dataset/doe-credential-totalpassed-students-2021-2022>

DOE Total Attempted 2021-2022:

<https://data.virginia.gov/dataset/doe-credential-attempted-students-2021-2022>

County Employment & Wages in Virginia:

<https://data.virginia.gov/dataset/county-employment-and-wages-in-virginia-across-all-counties-in-virginia>

Virginia Labor Force Participation Rates 2019-2021:

<https://data.virginia.gov/dataset/virginia-labor-force-participation-rates-2019-2021>

Population Projections 2010,2020,2030 by Race and Ethnicity:

<https://data.virginia.gov/dataset/population-projections-2010-2020-2030-by-race-and-ethnicity-virginia>

Population Projections 2010,2020,2030 by Gender:

<https://data.virginia.gov/dataset/population-projections-2010-2020-2030-by-gender-virginia>

Population Projections 2010,2020,2030 by Age group:

<https://data.virginia.gov/dataset/population-projections-2010-2020-2030-by-age-group-virginia>

SOC List Export High Demand:

<https://data.virginia.gov/dataset/virginia-2024-high-demand-occupations/resource/f27dc857-af9c-451b-ad01-bc9b54a26934>

