

# Certificates: A True Short-term Pathway to Success?

A Collaborative Analysis  
by:



**COLORADO**  
Department of  
Labor and Employment

**TEXAS**  
Workforce Commission





# Team Six



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# Goals & Purposes

- The Texas Workforce Commission is actively engaged in fulfilling its stated strategic objective to “**increase short-term credentials in high-demand occupations**” by 2031. Given this and similar initiatives in other states, our goal is to understand the realities of certificate attainment primarily with respect to income.
- Our research has revealed that certificates provide a **valuable means to quality employment**. Given our findings, a key purpose of our analysis is to inform future policy & funding decisions to encourage certificate attainment as an expeditious, comparably remunerative pathway to success.
- Credential attainment may also reduce barriers to advancement often experienced by youth and adults who are reskilling and/or upskilling. Implementing policies that promote certificate attainment could provide a significantly **more affordable and equitable** option.
- Based on our literature review, we find evidence of a shift in hiring practices toward skills and competencies as the deciding factor, over degrees held– a ripe opportunity to promote increased certificate attainment.

# Certificates offer:

Affordability 

Efficiency 

Equity 

## But what about income? Do Certificates Deliver?

### Our Major Findings:

- Certificate Holders' mean wage meets our definition for quality employment at Y5.
- Certificate attainment increases reported earnings over time and is comparable to income growth of Traditional-Degree Holders between Y5 and Y8, with 52% mean income growth.
- Certificates have value as a stand-alone credential and add value when combined with a traditional degree (Based on mean wages of Y9)

# Design & Methodology:

We analyzed “Syntucky” reported income data for **3 primary groups of completers** within the **Business and Computer Science** disciplines

- Certificate Only
- Traditional (Associate and/or Bachelor) Degree Only
- Certificate with Associate/Bachelor Degree

We then considered age at time of first credential completion

# Definitions

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**Degree Holder:** Excludes *Doctoral* and *Master* Degrees but includes *Associate* and *Bachelor* Degrees as First or High\_Completion\_Label. **(Comparison Group)**

**Certificate Holder:** Includes individuals whose First\_Completion\_Label is (high school) *Diploma* or *Certificate* AND High\_Completion\_Label is *Certificate* BUT excludes any individual whose High\_Completion is *Associates* or *Bachelors*.

**Certificate & Degree Holder:** Includes ONLY individuals whose First\_Completion\_Label is *Certificate* AND whose High\_Completion\_Label is *Associates* or *Bachelors*.

**Living Wages:** As determined by the MIT Living Wage calculator, Living Wages for 1 adult 0 children equates to \$31,136/yr. This is determined by taking the \$15.45/hr and multiplying by the 2080 hours that compose a full-time schedule.

**Quality Employment:** This is based on reported earnings exceeding the Living Wages of Kentucky.

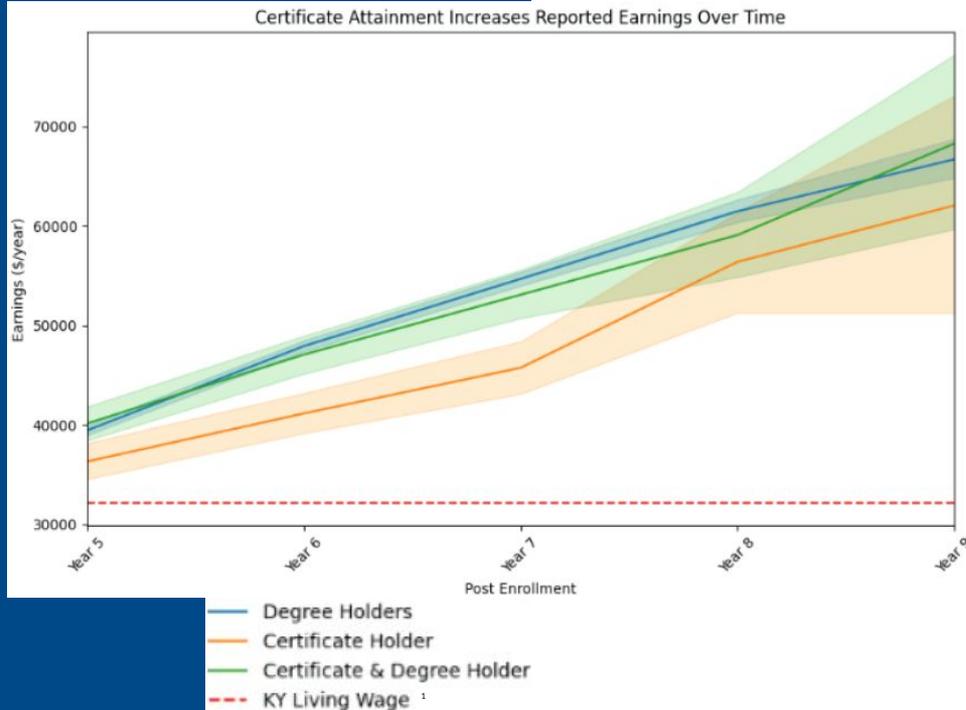
# Missingness

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- Y1 - Y4 Wage Data are not present in the Synthetic Data.
- Employment outcomes data for some Certificate Completers were not available as individuals may not be employed within Kentucky.
- When considering “value”, we did not consider the contrafactual case, and do not have data to compare completers whose highest credential attained is a certificate against those with no credential.
- We did not consider completers by gender or URM vs. non-URM classifications.

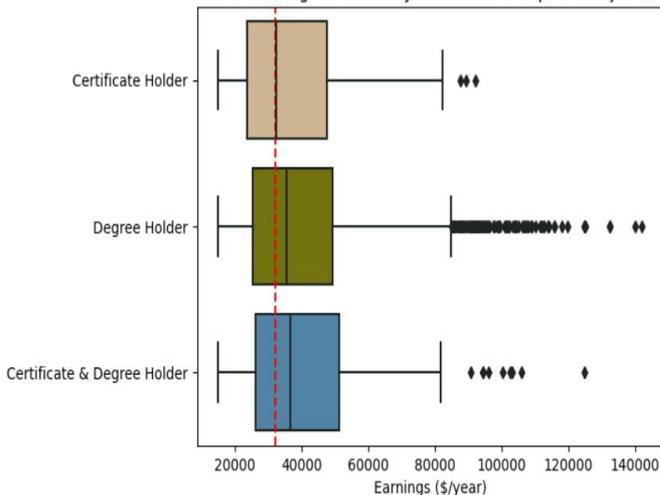
# Certificate Attainment Increases Reported Earnings Over Time

Shaded Regions include 95% of occurrences of data points from the group of matching color

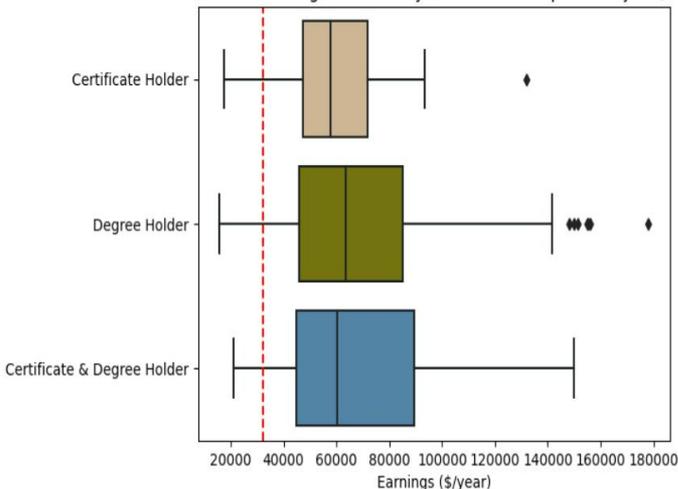


- Certificate attainment has a broader range of earnings and correlates to higher reported income.
- Each group exceeds the living wage threshold by at least year 5, post enrollment.
- Certificate attainment reflects higher income when compared to attainment of a traditional degree and no certificate.

Distribution of Earnings in Year 5 by Education Group - All Majors (n=6,356)



Distribution of Earnings in Year 9 by Education Group - All Majors (n=846)



# Income Parity is Achieved by Year 5

- Wage distribution does not change significantly based on type of credential.
- Year 5 includes earners **below** the living wage threshold.
- Year 9 shows increased earnings for those having completed both a certificate and a degree.
- The number of outliers is significantly lower by Year 9.
- Year 9 Mean Earnings of the Certificate & Degree group exceed those of the Degree group despite Median earnings being lower.
- Year 9 Mean Earnings:
  - Certificate Holders: \$62,065 (n=20)
  - Degree Holders: \$66,703 (n=779)
  - Certificate & Degree Holders: \$68,290 (n=47)

# Certificates Produce Steady Income Growth

Group Designation	Year 5 % Above Living Wage	Year 8 % Above Living Wage	% Change in Mean Earnings Y5 → Y8
Certificate Holder (n=61)	+51%	+85%	+52%
Degree Holder (n=1974)	+58%	+88%	+52%
Certificate & Degree Holder (n=136)	+61%	+85%	+43%
Y5 Standard Deviation: Certificate Holder: \$14,725 Degree Holder: \$18,325 Certificate & Degree Holder: \$16,557		Y8 Standard Deviation: Certificate Holder: \$21,504 Degree Holder: \$25,680 Certificate & Degree Holder: \$26,967	

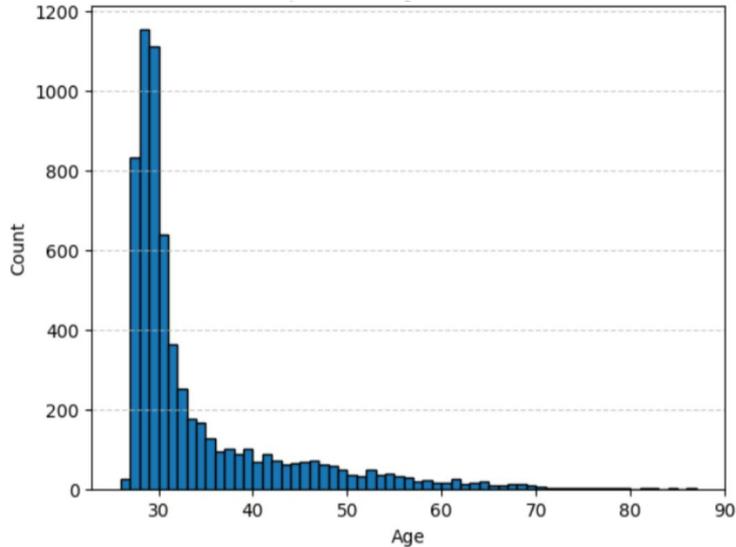
Certificate holders show comparable growth in their mean earnings as compared to Degree holders, implying steady growth of income over time which stands out as an indicator of job quality.

Mean Earnings for Certificate holders grow from \$37,154 in year 5 to \$56,392 in year 8.

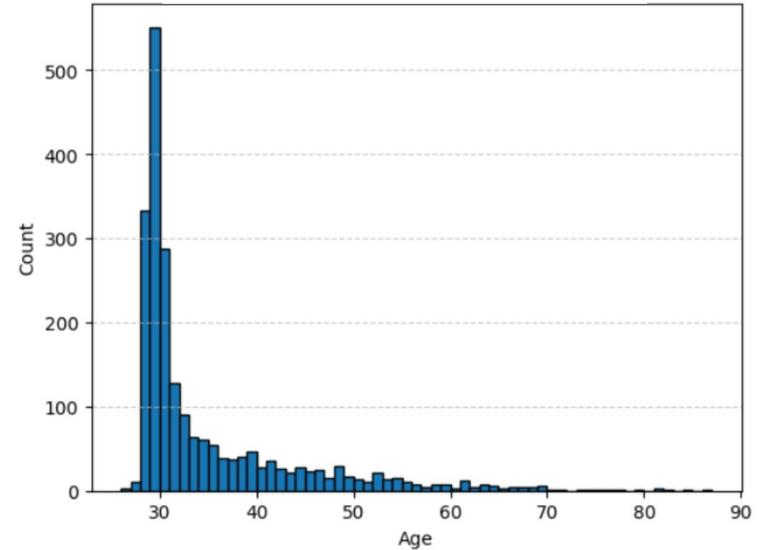
Mean Earnings for Degree holders grow from \$40,360 in year 5 to \$61,428 in year 8.

# An Opportunity for Workforce Development

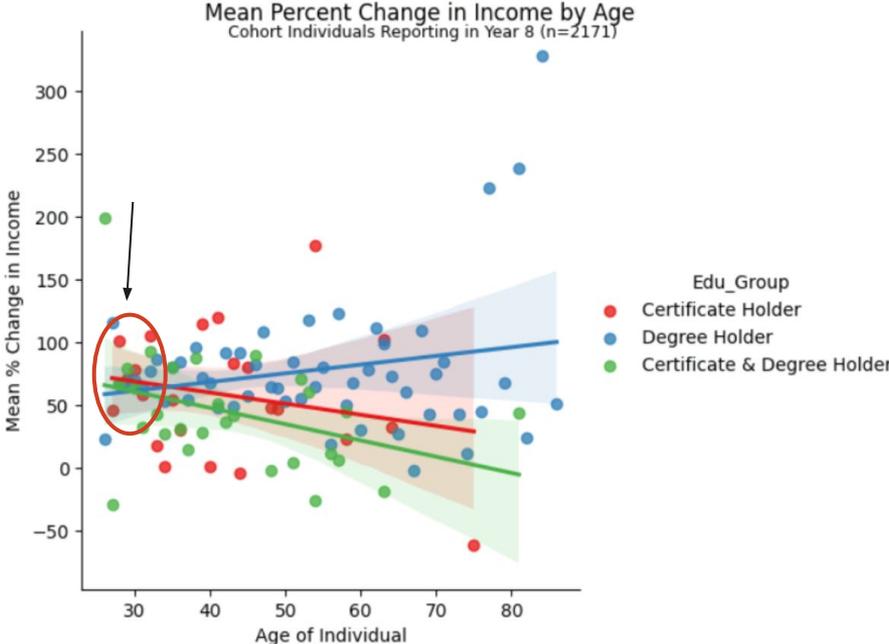
Age of Individuals in Cohort  
who reported earnings in Year 5 (n=6356)



Age of Individuals in Cohort  
who reported earnings in Year 8 (n=2171)



# Certificate Attainment by Age 35 Increases Income 50-100%



- Mean Income reflects 50-100% growth for Certificate Holders aged 30-35 from Y5-Y8.
- Lines reflect the mean trends by age.
- Dots are specific data points pertaining to reported income.

# Limitations

*“Errors using inadequate data are much less than those using no data at all”*

-Charles Babbage



Throughout our research, we have identified the following limitations:

- As mentioned in the beginning, the data do not offer sufficient information to calculate counts with degrees attained before certificates.
- Employment Data accounted for less than 50% of the Master Data Set, so there may be missing elements in this analysis.



# Literature Review

The State of Skills-Based Hiring, 2023.

<https://downloads.ctfassets.net/vztl6s0hp3ro/7aIXRKYMzBFjP9fiJqZv2V/28f098b593d05338231189c079998b07/The-State-of-Skills-Based-Hiring-2022-TestGorilla.pdf>. Authors make the claim that skills-based hiring is replacing traditional recruitment practices.

Navigating Public Job Training by David Deming et. al. Harvard Project on Workforce [Navigating Public Job Training \(harvard.edu\)](#). Authors analyze opportunities for job-seekers via Eligible Training Provider Lists maintained by states. They are critical of WIOA-funded programs that steer participants into low-paying, low-quality jobs over other short-term credential programs that offer higher pay and potential for advancement.

[University of Texas system bets big on microcredentials \(insidehighered.com\)](#) A study of the rationale and expectations of the partnership between UT System and Coursera to provide certificate and certification programs to students pursuing a degree at a UT-System campus.

[Career and technical programs being reimaged by urban school districts - The Washington Post](#) Authors consider the necessary adaptations and restructuring to CTE programs to offer certificate and certification programs leading to higher employability for high-school graduates following the decades-long predominance of college-preparatory programs.

# Conclusions and Policy Recommendations

- Certificate attainment generates positive quantitative measures in terms of income, income parity with degree holders, and income growth.
- Qualitative outcomes of certificate attainment include implied higher confidence levels among job seekers, increased employability, skill-building, and the means for acquiring and advancing in a career.
- Certificate attainment addresses upward-trending preferences for skills-based hiring.
- States need to adopt a focused approach that includes credential-inventory and value studies based on comparative outcomes data for specific certificate types.
- Policy decisions should include a reconsideration of funding options to promote enrollment in certificate programs.
- Initiatives that encourage Career and Technical Education programs in high school or middle school could educate advisors and students on the benefits of certificate attainment.



# Thank You For Your Attention!



Brett Rogers



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Zen Van Loan



# Questions & Answers



# Next Steps



## Discuss & Review Timelines

Is there an opportunity to explore deeper to determine which credentials provide the quickest routes to quality employment?



## Evaluate if there are Additional Variables

We want to explore if there are additional outliers distorting our data through exploring age demographics.

Likewise, we will explore more granular credential data and disseminate key differences in reported earnings.



## Review Feedback to Revise Visuals and Data Intake

We're looking forward to your contributions to help us better sculpt our analysis into a meaningful contribution to society!

PLACEHOLDER FOR AGE VISUALIZATIONS TO HELP GUIDE STATE INITIATIVES TO INCREASE SHORT TERM CREDENTIALS IN THE WORKFORCE OF TOMORROW.

Added benefit for certificate attainment at a young age allows folks to grow even further in their career. Many 24 year olds in this space - help avoid the middle skills gap.

Certificate completers may also expect

DESCRIPTIVE COMMENTS:

At Y5 - X% of Cert Holders Earned Above Min Wage and Living Wage (Take aways)

At Y8 - X% of Cert Holders income growth from Y5 - Y8

At Y8 - Dual Wielders were X% above Comparison group.

Also for Dual Wielders.

PREDICTION COMMENTS:

On a path to higher earnings and a CAREER (Certificate pathway to a career)

Anticipate increased earnings to X% or something.

Good context for next slide to better explain the definitions and groups we've created.

Good opportunity to highlight the comparison group (bachelor)

When we look at only cert holds, is it a viable path towards a quality job. They don't cross right away, but they do cross (opportunities for early intervention (hs graduates)).

Alternative Path (this is section 1)

2nd question: Does it add value for those who had a bachelor's degree. (The combo group) is there value in having multiple vs just bachelors?

How do we optimize the value add feature of a certificate. (This is speaking to some closing slides about proposed policy etc)

Hard to find programs.

**ANSWER QUESTION: YES THEY ADD VALUE ACROSS BOARD.** Pity the state that don't pay attention.

Funding sources still favor traditional degrees

# PREDICTIONS

- In order to ascertain potential earnings for the three groups we are reviewing, we developed a model that reviews mean earnings and their growth between years 5 and years 8 to generate earnings predictions for year 9.
  - Results were compared back to the original results to determine accuracy.
  - *There is a discrepancy in the actual vs predicted earnings within all groups due to a small sample size within the year 9 earnings for testing.*
- Figure 1 reflects continued growth in earnings that continues to maintain parity with Degree holders.
- Figure 2 depicts how little variability exists in our predictive model reflecting a linear relationship between actual and predicted earnings.

Figure 1:

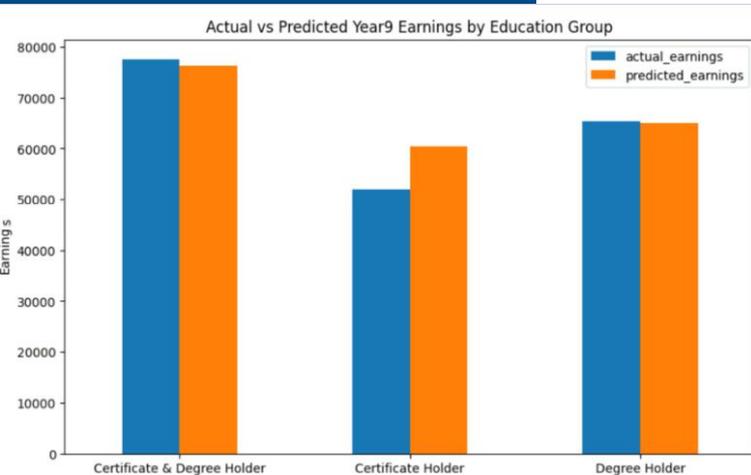
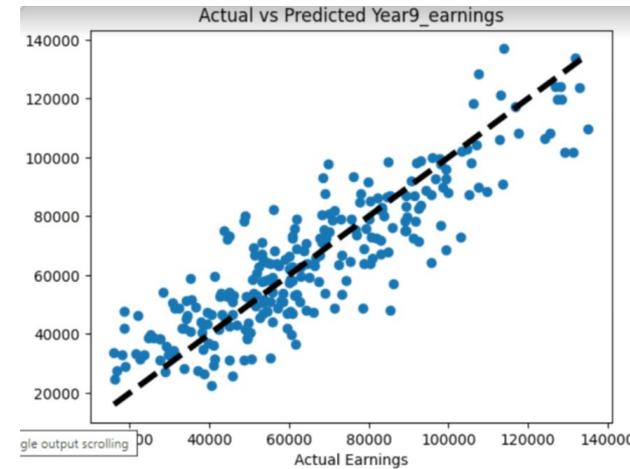


Figure 2:



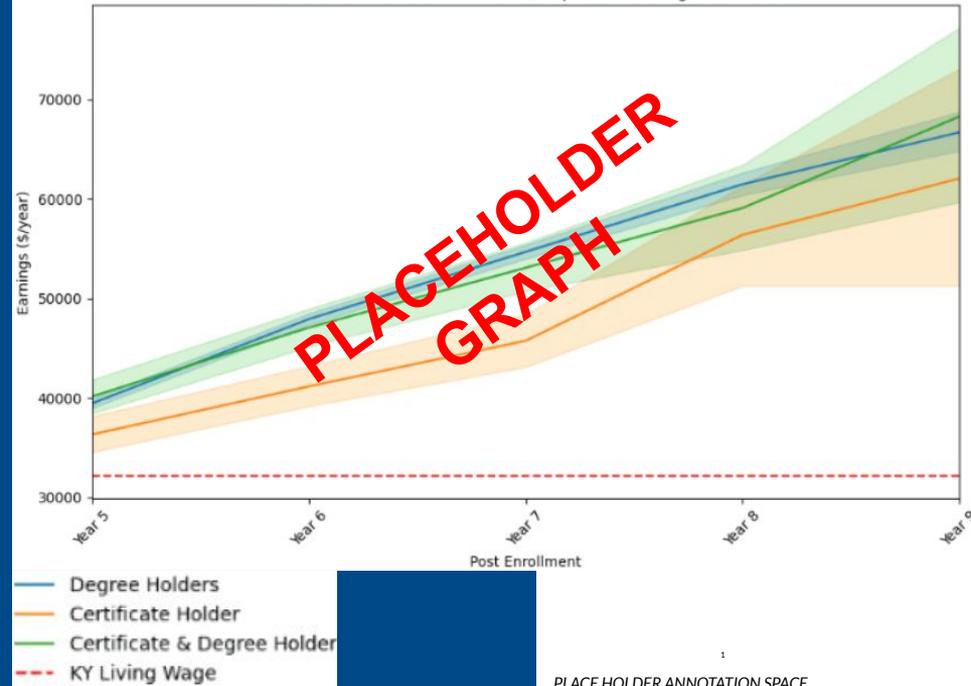
# PLACEHOLDER TITLE

PLACEHOLDER FOR INFO

PLACE HOLDER FOR ENGAGEMENT

PLACE HOLDER FOR OUR CONCLUSIONS

Certificate Attainment Increases Reported Earnings Over Time

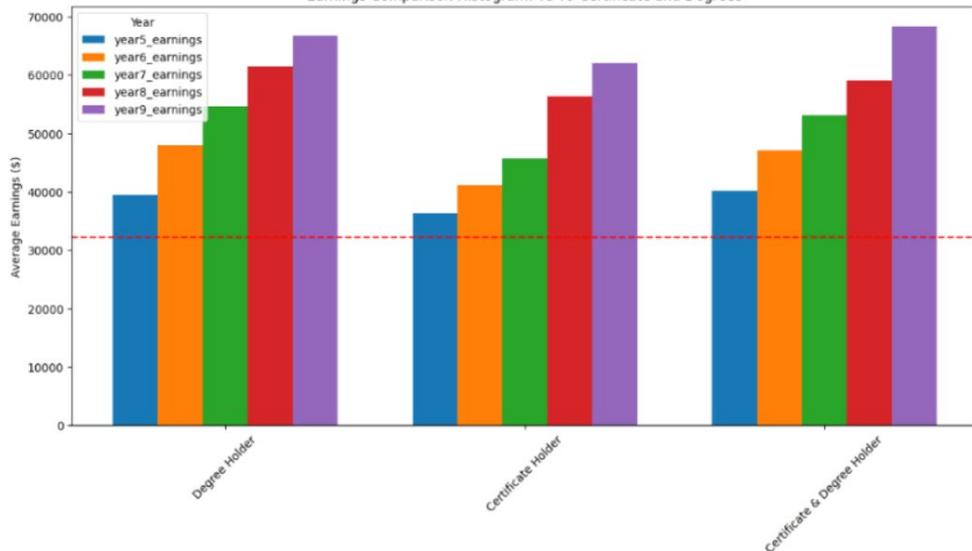


PLACE HOLDER ANNOTATION SPACE

<sup>1</sup> KY Living Wage is determined by MIT Living Wage Calculator: <https://livingwage.mit.edu/states/21>  
Living Wage in KY for 1 Adult 0 Children: \$32,136.  
(\$15.45 x 2080 hours)

# Average Earnings Comparison: Alternate Visualization

Earnings Comparison Histogram: Y5-Y9 Certificate and Degrees

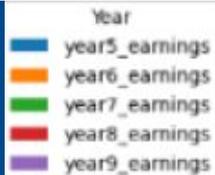


Looking at the visualization to the left, do you see anything different in comparison to the prior line graph?

- What do you immediately notice?
- What do you think is missing?

Our findings included:

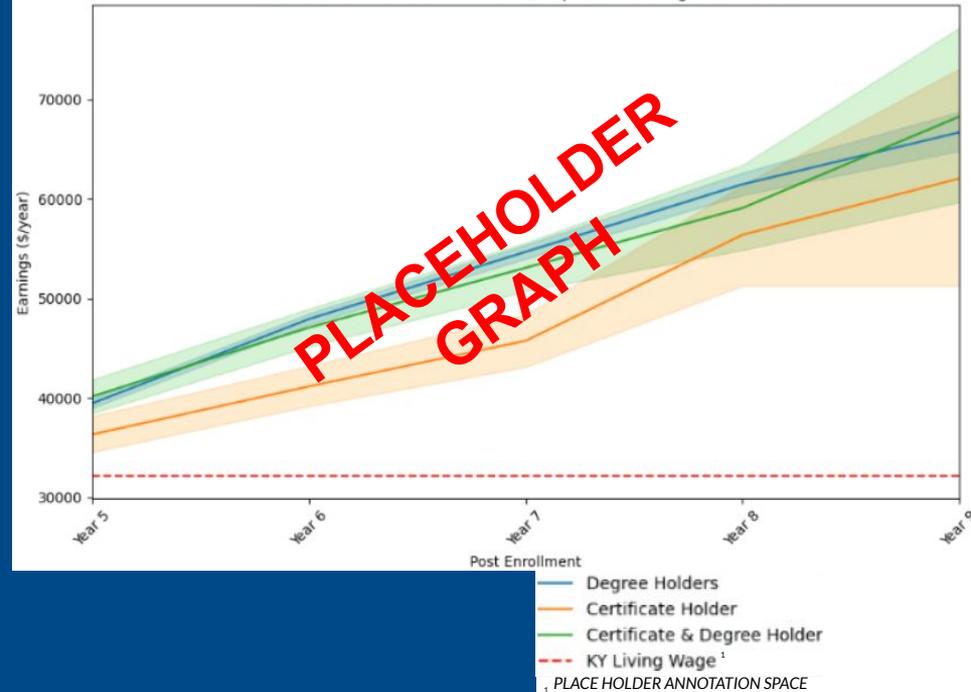
- Year 8 reflects a consistently larger growth of income within the Certificate holder's group.
- Year 8 demonstrates parity between all groups.
- All data groups show earnings above the living wage reflect by Year 5.



# PLACEHOLDER TITLE

PLACEHOLDER FOR INFO

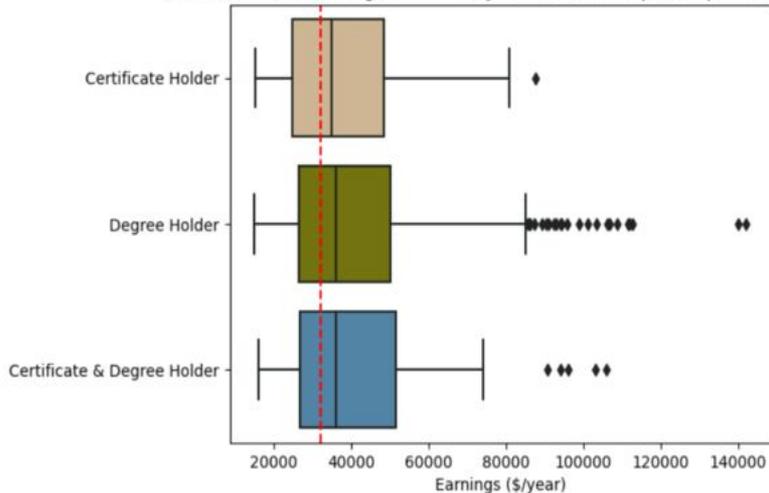
Certificate Attainment Increases Reported Earnings Over Time



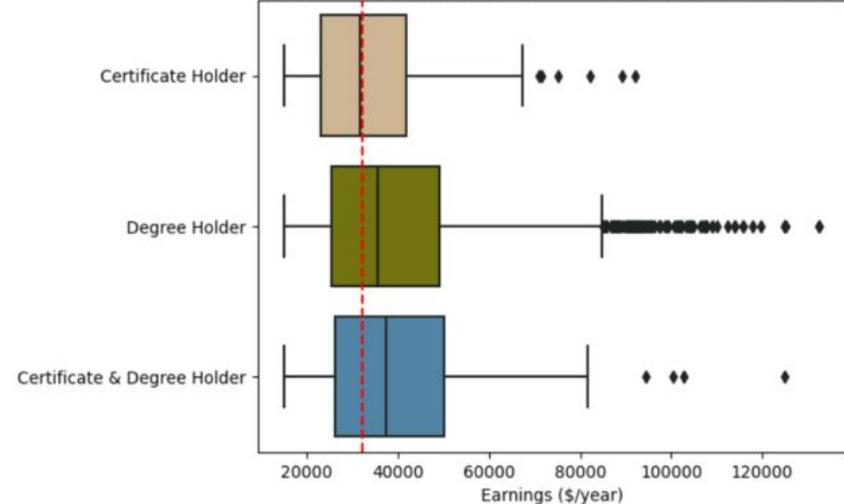
PLACE HOLDER FOR ENGAGEMENT

PLACE HOLDER FOR OUR CONCLUSIONS

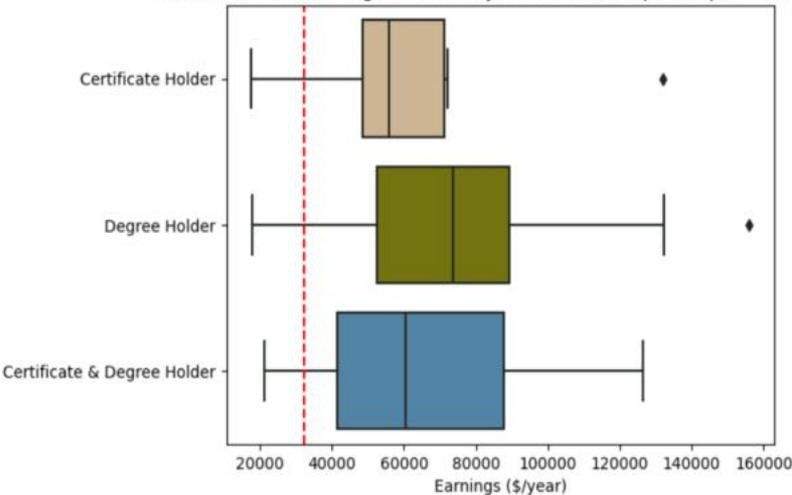
Dirtribution of Earnings in Year 5 by Education Group (Computer Science)



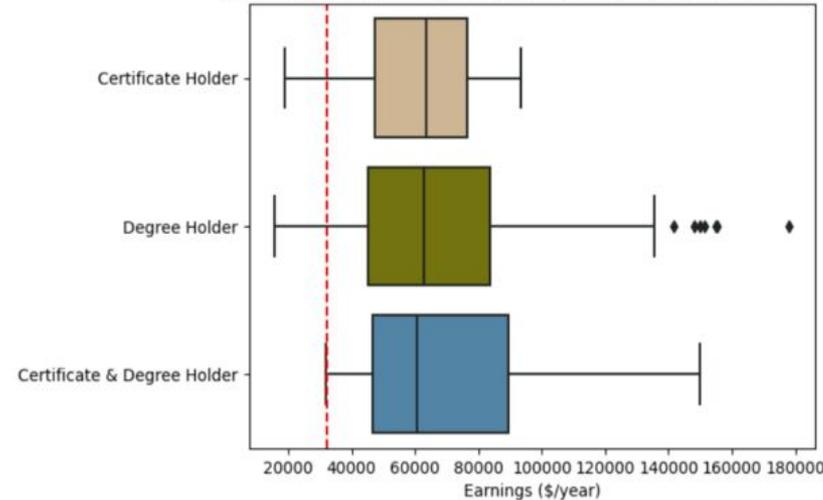
Dirtribution of Earnings in Year 5 by Education Group (Business)



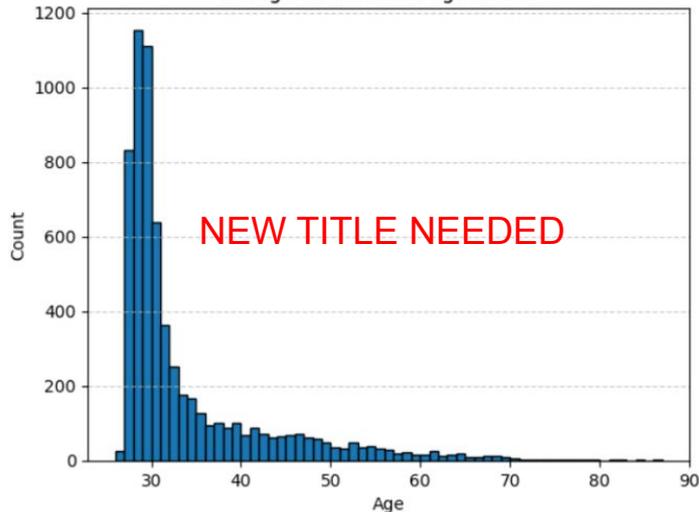
Dirtribution of Earnings in Year 9 by Education Group (Computer Science)



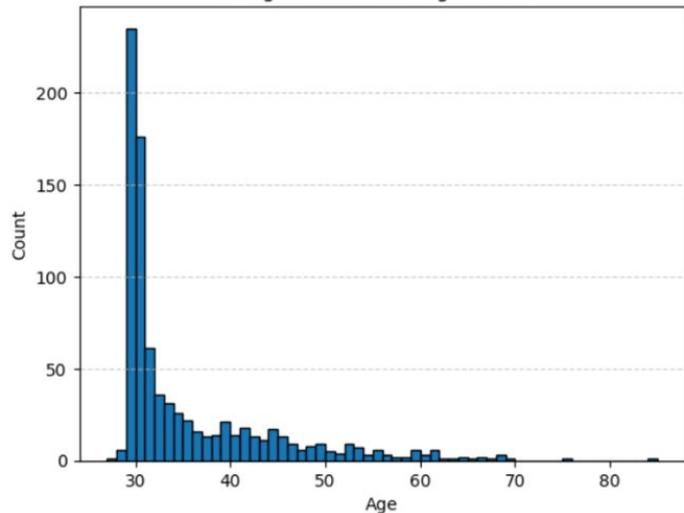
Dirtribution of Earnings in Year 9 by Education Group (Business)



Histogram of Cohort Age in Year 5



Histogram of Cohort Age in Year 9



# TEST

Looking at the visualizations to the left, how do things change from Year 5 to Year 9? *(Please hold commentary until Q&A)*

- What do you immediately notice about these graphs?
- What do you think is missing?

Our findings included:

- A significant reduction in the number of individuals.
- Y9 reduction seems to stem from the timeline 2015-2024, so there are not necessarily reports for this period.

Dots to the right of the boxes reflect outliers

PLACE HOLDER ANNOTATION SPACE

# Value of Certificate Attainment and Earnings Comparisons

A Collaborative Review by:  
The Colorado Department of Labor and Employment  
&  
Texas Workforce Commission





# Project Goal

Recent developments within the Texas Workforce Commission have revealed an upcoming initiative between 2025-2031 focusing on an increase in short-term credentials in high-demand occupations.

In the 2015 Syntucky Cohort, we are performing an analysis of earnings' outcomes to determine if there is a correlation between obtaining a certificate and obtaining quality employment. For the sake of this project, quality employment is limited in its definition to reported earnings and earnings growth over a period of five years. It is our hope, that the data we discover will show that a certificate provides a reasonable *and shorter* path to quality employment for graduates; likewise, we would like these results to better inform future policy developments to encourage alternative pathways to success for a larger number of individuals.

We believe this is an important opportunity to better address the lack of resources that are currently available for adults who are reskilling/retooling or returning to school; likewise, if policy changes are implemented, this provides a significantly more affordable option for many individuals which in turn better addresses Equity goals amongst multiple states with the added bonus of building a more skilled national workforce en masse!



# Visualization(s)



## **Data & Code**



## Next Steps & Limitations

- We hope to have a accurate image of earnings ramp up to living wages comparisons between certificate and degree holders.
- The numbers around earnings imply there may be unintentional typographical errors such as 24k or hourly rates vs annual wages.
- We do not have wages from year 1 to year 4 as the data structure is tailored for bachelor's attainment. As we're evaluating certificate earnings, we may be missing employment outcomes for certificate owners.
- In order to garnish a more accurate image, a minimum threshold was established of 15k/annually in line with Kentucky's minimum wage of \$7.25/hr for 2080 hours annually.
- We are unsure what Diploma means and have omitted results that tie into Diploma.



# Missingness

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- 
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# PROS AND CONS

## Pros:

1. The data is able to be compared at a more minute level to determine if there is a sufficient and immediate return on the investment to obtain education.
2. The data may inform policy decisions that allow for previously under-represented minorities to achieve significant return on their investment into education. Likewise, it may promote opportunities for Degree Holding Adults (defined as Adults with Associates, Bachelors - omission of Masters and Doctoral degree for this project) to reskill, obtain additional skills, or seek additional compensation for professional development.

## Cons:

1. The data does not offer an opportunity to properly calculate individuals who received a degree before a certificate; therefore, missingness may unintentionally skew the results to slightly favor traditional degrees.
2. Promoting certificates over traditional education could create an environment similar to For Profit schools that encourages high churn of students to create a false perception of a trained populous and alumni networks.
3. Employment Data accounted for less than 50% of the Master Data Set, so there may be missing elements unaccounted for in this analysis.



# Initial Descriptive Statistics

In order to maintain an adequate sample size and provide insight into different professional outcomes, we have utilized the following variables:

- First\_Completion\_Label (*Certificate, Associates, Bachelors, Diploma, NA?*)
  - *Captures Certificates that may be missing in High\_Completion\_Label*
- First\_Completion\_Acadyr
  - *Captures timeline of Certificate completion to correlate earnings*
- First\_Completion (*Business, Education, & Computer Science*)
  - *Captures Majors that may be missing in High\_Completion*
- High\_Completion\_Label (*Certificate, Associates, Bachelors, Diploma, NA?*)
- High\_Completion\_Acadyr
- High\_Completion (*Business, Education, & Computer Science*)
- Year5\_Earnings, Year6\_Earnings, Year7\_Earnings, Year8\_Earnings, Year9\_Earnings



# Definitions

Certificate Holder - Includes individuals whose First or High\_Completion\_Label is Certificate BUT excludes any individual whose High\_Completion is greater than Certificate

Degree Holder - Excludes Doctoral and Master Degrees but includes Associate and Bachelor Degrees as First or High\_Completion\_Label

Certificate & Degree Holder - Includes ONLY individuals whose First\_Completion\_Label is Certificate AND whose High\_Completion\_Label is Associates or Bachelors

Neither Certificate or Degree - An individual who has not reported a Certificate or Degree.