

# Unlocking the CAR: Data Diversification Strategies for Career Technical Education

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**Nebraska Department of Education**

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**NEBRASKA DEPARTMENT OF EDUCATION**



# Presentation Objectives

1. Understand the role of subpopulations in Perkins accountability data framework
2. Realize the challenges in relying solely on subpopulation analyses
3. Identify the value in adopting and utilizing a CTE data diversification strategy
4. Gain practical suggestions for initiating a CTE data diversification effort



# Locked in the CAR - Reveiw

1. Because the success or failure of CTE student learning/outcomes becomes based on CAR data, any misgivings about the reliability or validity of said data calls into question not only our efforts/purpose within education
  - In a data-driven world, this leaves us in a rather precarious position
    - All we can speak to is CAR data and anecdotes



# Locked in the CAR - Review

2. Because the CAR data framework adopts a “strict” subpopulation evaluation, CTE student data is largely analyzed in isolation from other/larger student populations
  - So, even if the CAR data is deemed valid and reliable, we are left explaining only CTE student data – but relative to what...a state goal?
  - Okay, but what does this say about CTE students as part of a larger student population?



# Locked in the CAR - Reveiw

- Collectively, then, these challenges and implications characterize the problematic **“Locked in the CAR”** scenario.



# Strategies for Unlocking the CAR

- Data Diversification using:
  1. Perkins Accountability Data
    - Longitudinal
    - Cross-sectional
      - Student characteristics (subpopulations)
  2. Population Data
    - Cross Tabulations
    - Descriptive Statistics
    - Analytic Statistics



# Strategies for Unlocking the CAR

- Data Diversification using:
  3. Auxiliary Data
    - Surveys
    - Enrollment Data
    - Course Offering Information
    - Statewide Longitudinal Data - (SLDS)



# Strategies for Unlocking the CAR

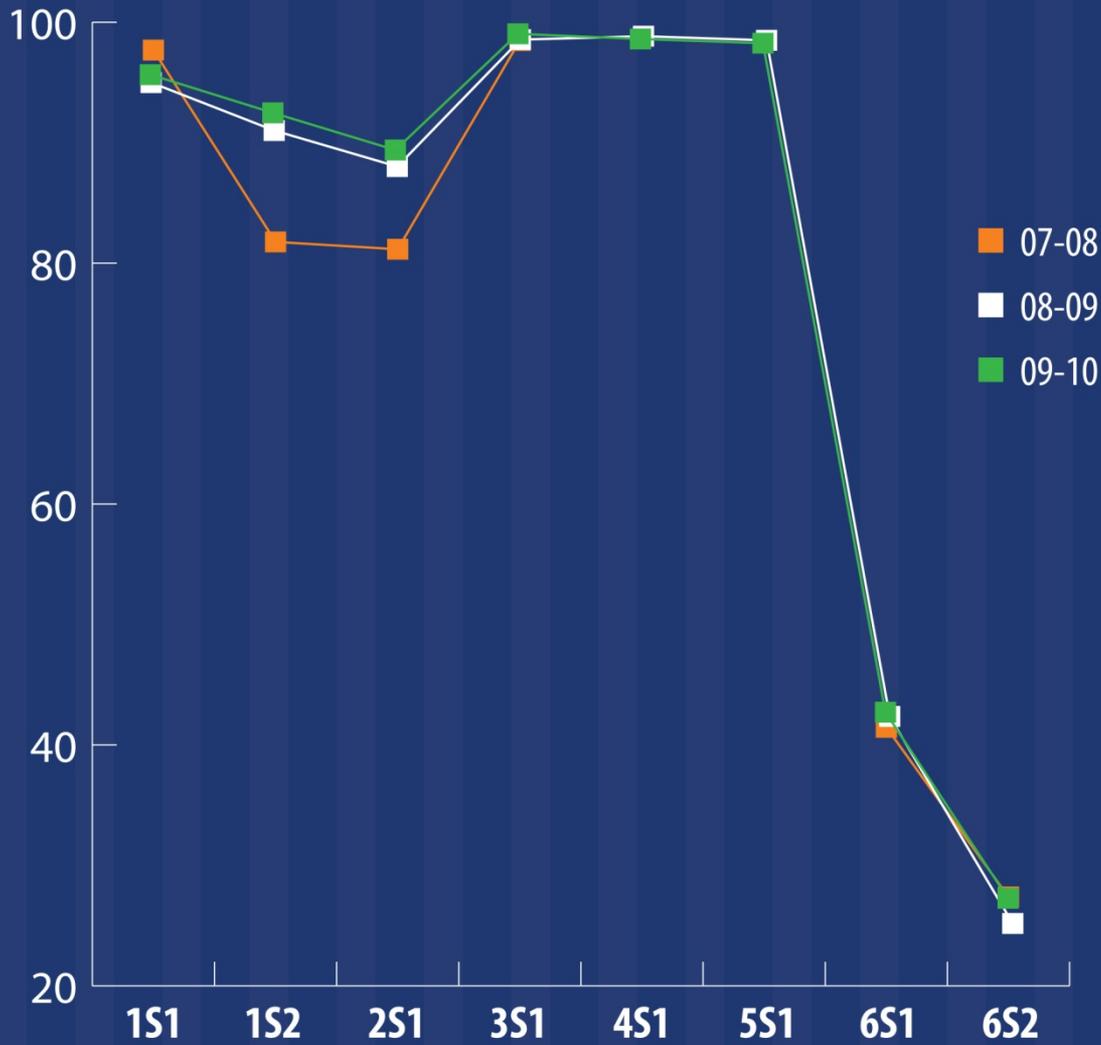
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# Using Perkins Accountability Data

- Longitudinal Example:
  - 2007-2010 Secondary Longitudinal Average Performance





## Secondary Longitudinal Average Performance



# Strategies for Unlocking the CAR

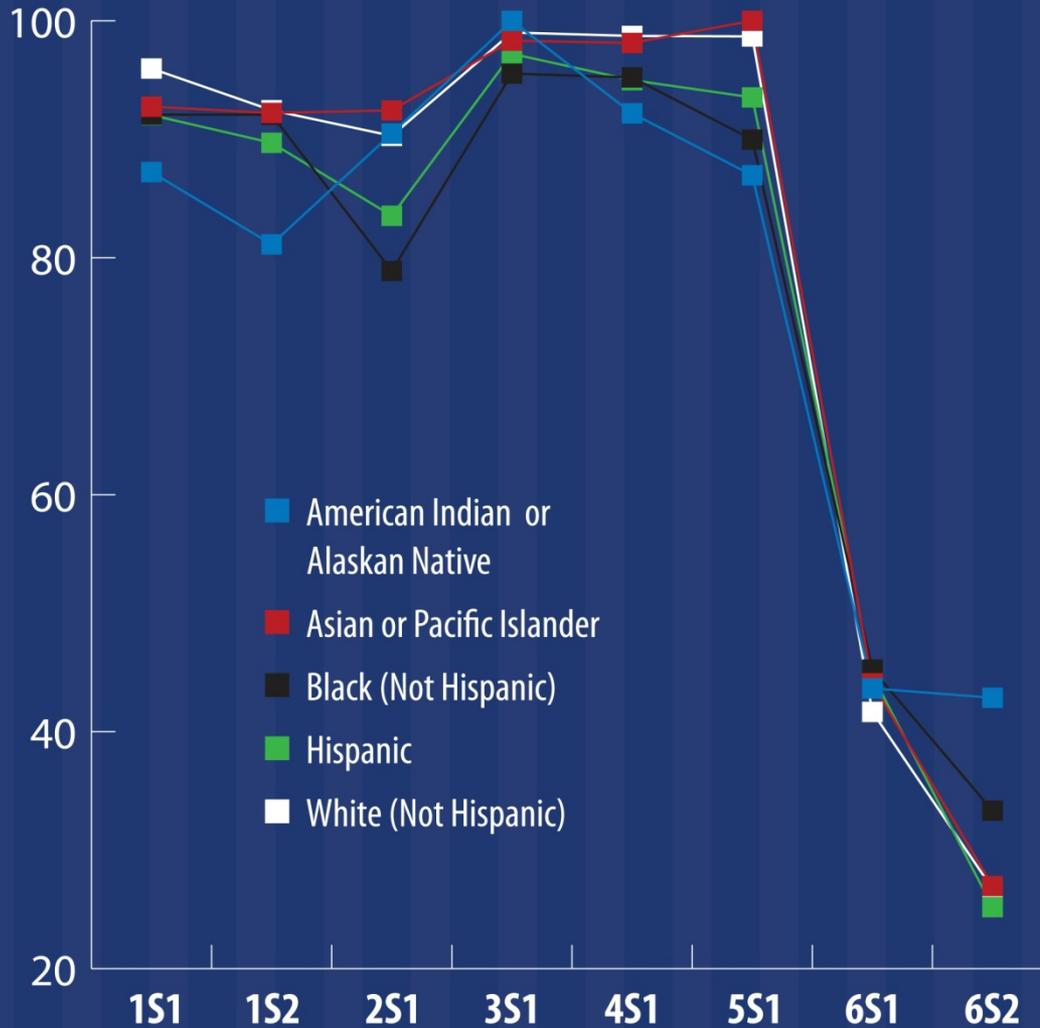
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# Using Perkins Accountability Data

- Cross-sectional Example:
  - Student Characteristic of interest = Ethnicity
    - 2009-2010 Secondary Performance by Ethnicity





## Secondary Performance by Ethnicity



# Using Perkins Accountability Data

- Needed Data Set:
  - Only Perkins CAR data
    - Unit-level data is ideal
      - That is, one unique data record per CTE student

Student ID	Last Name	Gender	Race/Ethnicity	AYP Math	Participant
123456789	Hastings	Male	White	Not Proficient	No
135792468	Doe	Female	American Indian	Proficient	Yes

- Multiple years of Perkins CAR data
  - For longitudinal analyses



# Using Perkins Accountability Data

- Needed Data Elements:
  - What specific student characteristics should be included in the data set?
    - Perkins performance indicator information
      - Is the student counted in the numerator/denominator subpopulations for each indicator?
    - Any other student characteristics of interest (ethnicity)

Student ID	Last Name	Gender	Race/Ethnicity	AYP Math	Participant
123456789	Hastings	Male	White	Not Proficient	No
135792468	Doe	Female	American Indian	Proficient	Yes



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# Using Population Data

- Cross Tabulation Example
  - AKA contingency tables or “cross tabs”
  - For example, consider 100 CTE students completing a math examination

	Male	Female	Total
Passing	20	40	60
Not Passing	30	10	40
Total	50	50	100



# Using Population Data

Concentrator	Gender								
	Male			Female			Total		
	<i>n</i>	<i>Row %</i>	<i>Column %</i>	<i>n</i>	<i>Row %</i>	<i>Column %</i>	<i>n</i>	<i>Row %</i>	<i>Column %</i>
Yes	4,685	57.39	37.12	3,479	42.61	30.01	8,164	100.00	33.71
No	7,936	49.44	62.88	8,115	50.56	69.99	16,051	100.00	66.29
Total	12,621	52.12	100.00	11,594	47.88	100.00	24,215	100.00	100.00

## CAR Data:

57% of Nebraska CTE Concentrators are male, whereas 43% of Nebraska CTE Concentrators are female.

## Population Data:

57% of Nebraska CTE Concentrators are male, compared to 52% of the Nebraska 12<sup>th</sup> grade student population.

43% of Nebraska CTE Concentrators are female, compared to 48% of the Nebraska 12<sup>th</sup> grade student population.



# Using Population Data

Concentrator	Gender								
	Male			Female			Total		
	<i>n</i>	<i>Row %</i>	<i>Column %</i>	<i>n</i>	<i>Row %</i>	<i>Column %</i>	<i>n</i>	<i>Row %</i>	<i>Column %</i>
Yes	4,685	57.39	37.12	3,479	42.61	30.01	8,164	100.00	33.71
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Total	12,621	52.12	100.00	11,594	47.88	100.00	24,215	100.00	100.00

## CAR Data:

57% of Nebraska CTE Concentrators are male, whereas 42% of Nebraska CTE Concentrators are female.

## Population Data:

57% of Nebraska CTE Concentrators are male, compared to 52% of the Nebraska 12<sup>th</sup> grade student population.

42% of Nebraska CTE Concentrators are female, compared to 48% of the Nebraska 12<sup>th</sup> grade student population.



# Strategies for Unlocking the CAR

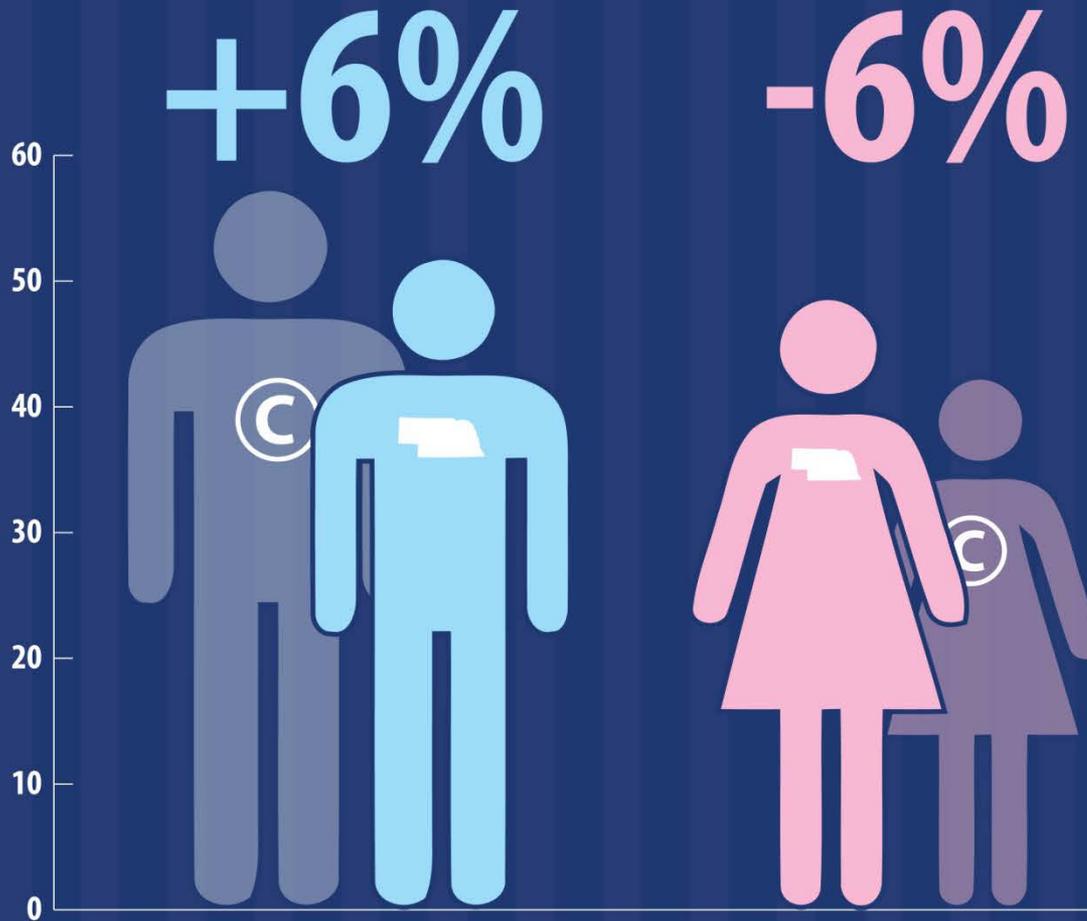
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# Using Population Data

- Descriptive Statistics Examples
  - These infographics use data derived from simple cross tabulations like that presented earlier

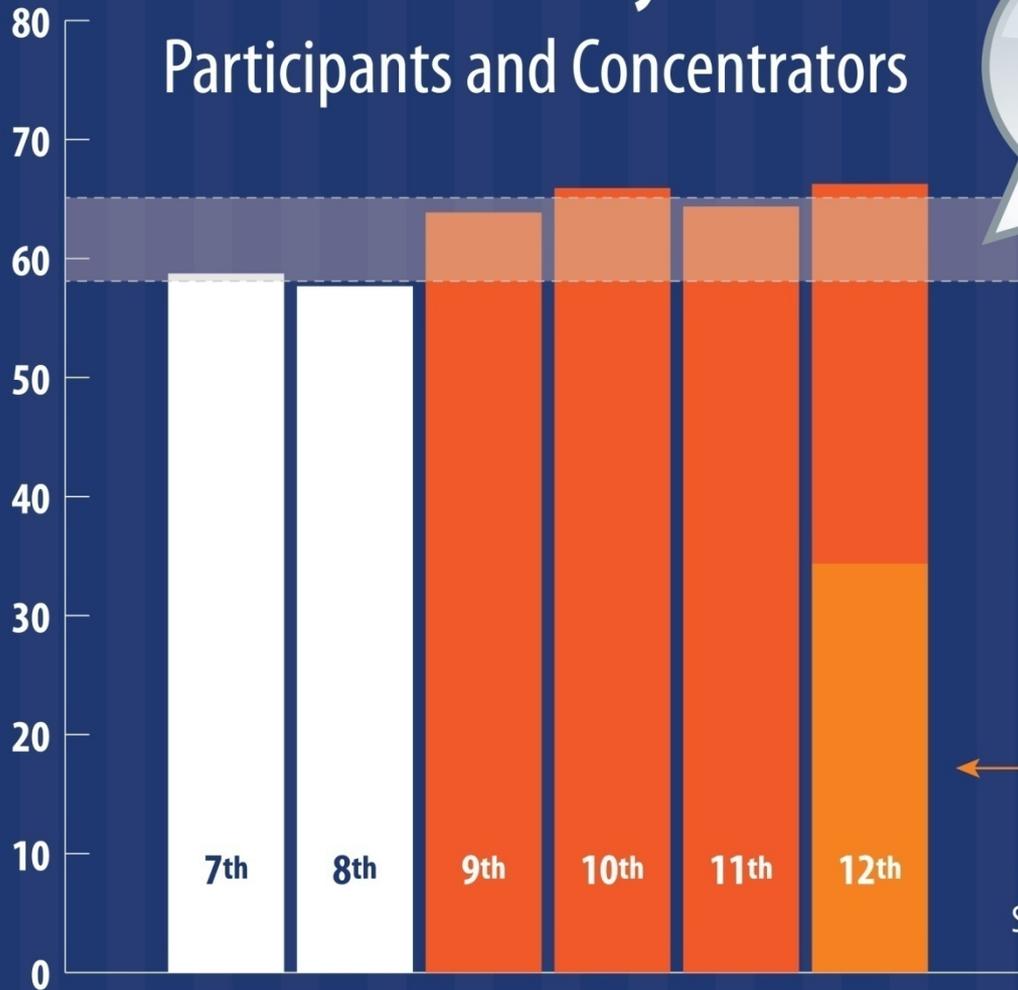




## Descriptive Statistics: Gender Concentrators vs. All High School Seniors



# Descriptive Statistics: CTE Students by Grade Participants and Concentrators

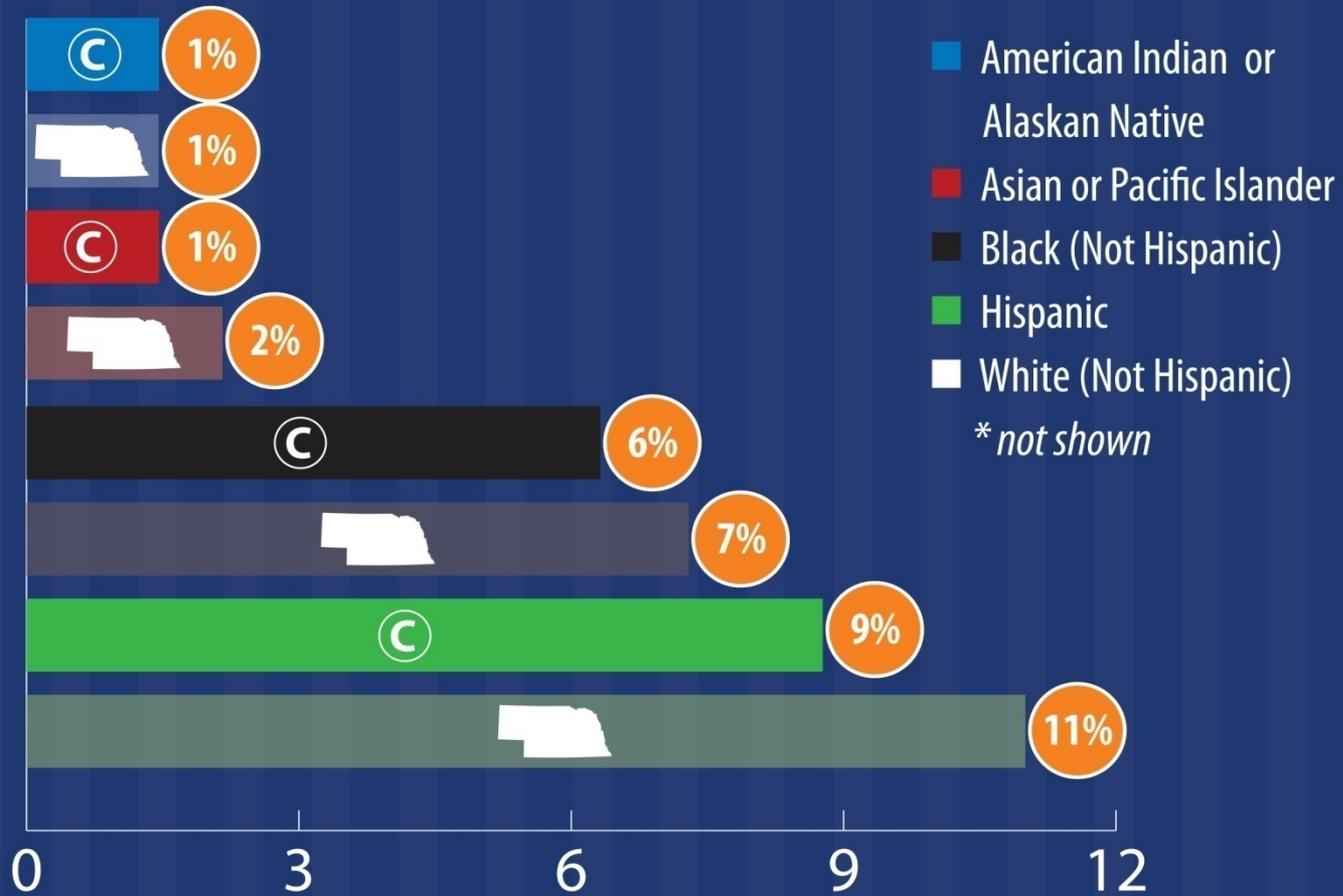


**8%**  
average increase in Participants  
between Junior High  
& High School

**2/3**  
of all Nebraska High School  
Seniors are CTE Participants

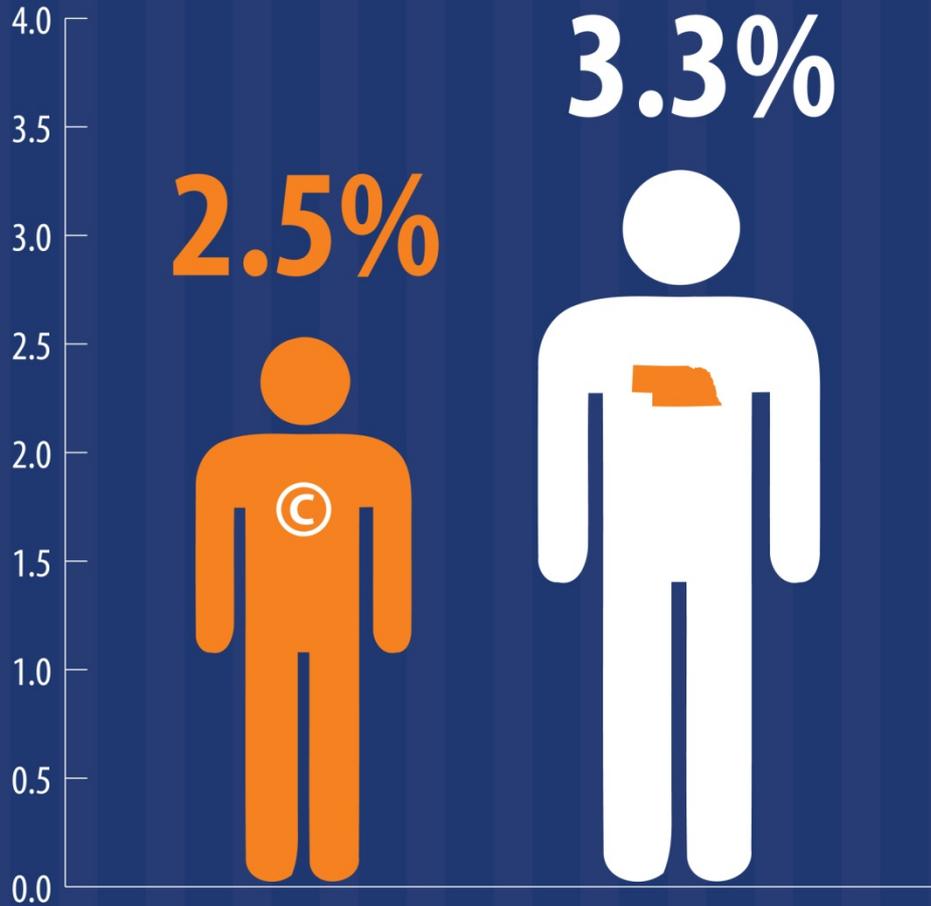
**1/3**  
of all Nebraska High School  
Seniors are CTE Concentrators





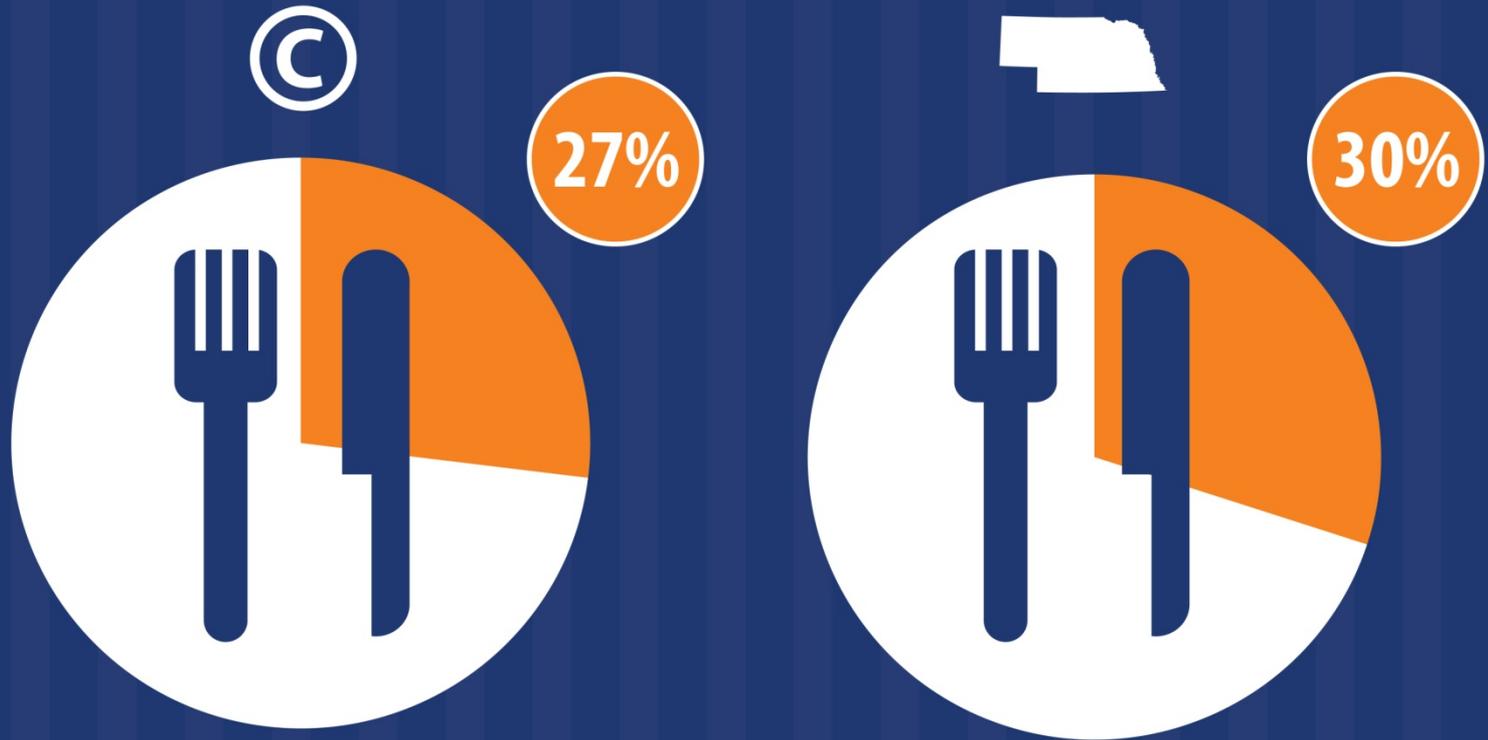
## Descriptive Statistics: Ethnicity Concentrators vs. All High School Seniors





## Descriptive Statistics: Immigration Status Concentrators vs. All High School Seniors





## Descriptive Statistics: Food Program Eligibility Concentrators vs. All High School Seniors





**18%**

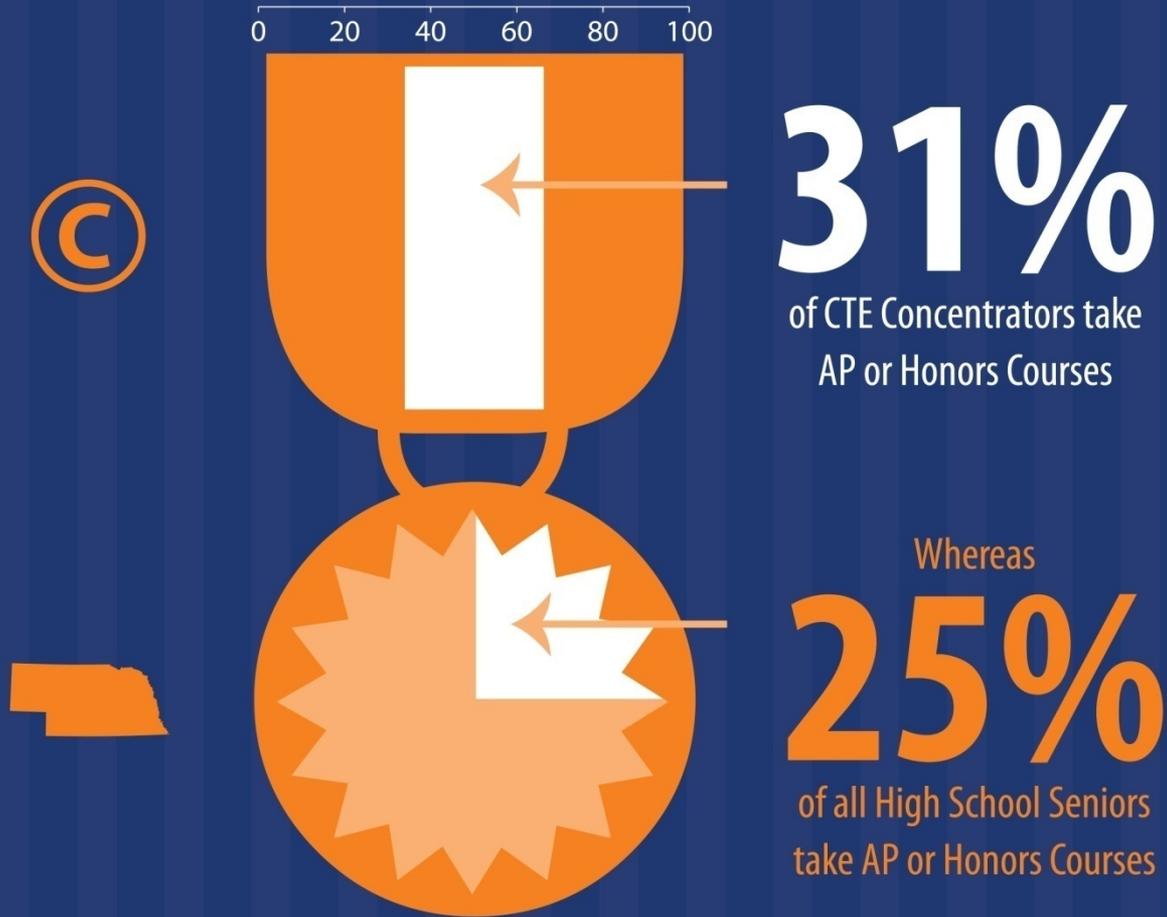
of all High School Seniors  
are eligible for Gifted Programs



## Descriptive Statistics: Gifted Eligibility

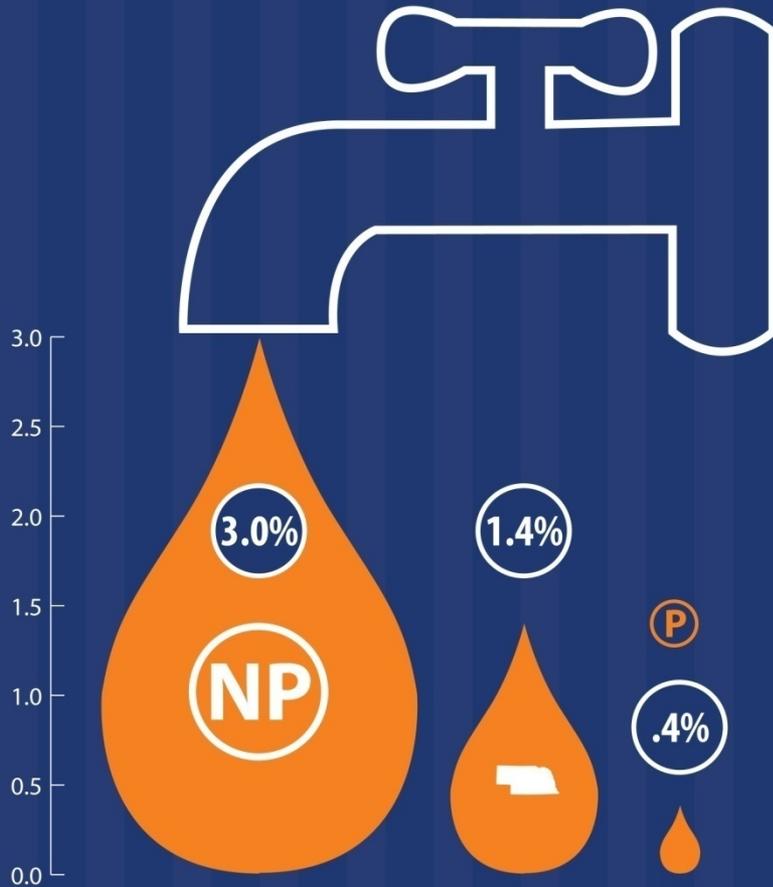
### All High School Seniors vs. Concentrators





## Descriptive Statistics: AP or Honors Courses Concentrators vs. All High School Seniors





0.4% of students grades 7-12 participating in Career Education dropped out of school

Compared to

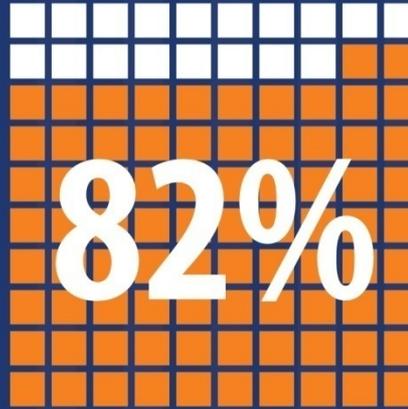
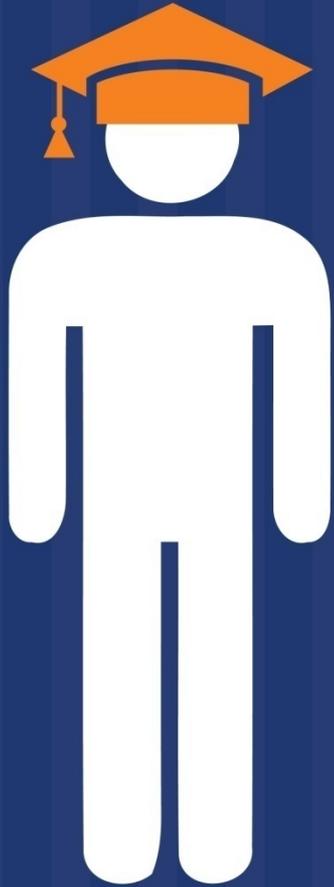
3% of students grades 7-12 *not* participating in Career Education.

Overall, 1.4% of all Nebraska students grades 7-12 dropped out of school.

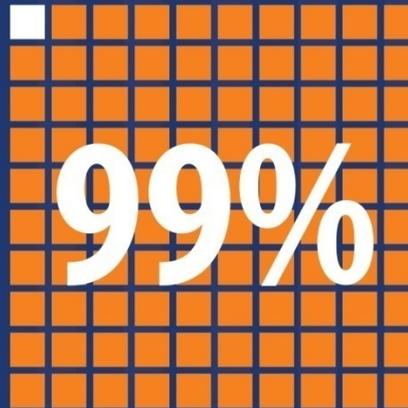
## Descriptive Statistics: Dropouts

Non-Participants, All Students Grades 7-12, Participants





Whereas



of Nebraska high school seniors completed an approved program of study and met district/system requirements for a high school diploma

of CTE Concentrators completed an approved program of study and met district/system requirements for a high school diploma

## Descriptive Statistics: Completer with Diploma All High School Seniors vs. Concentrators



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# Using Population Data

- Analytic Statistics Example:
  - Using a logistic regression model to predict the relative odds of dropping out of school for CTE students
    - Controlling for standard sociodemographic student characteristics, preliminary analyses indicate that:
      - The odds of dropping out of school decrease by 74 times for Nebraska Career Education Participants compared to their non-participant peers
      - The odds of dropping out of school decrease by 26 times for Career Education Concentrators compared



# Using Population Data

- Needed Data Set:
  - Both CAR data and larger student population data
    - Unit-level data is required
      - That is, one unique data record per student
    - Must have complete unit-level data for **both** CTE and non-CTE students (the entire student population of interest) for all student characteristics (variables) of interest
      - That is, if you are interested in dropouts, you need dropout information for both CTE and non-CTE students (the entire student population of interest)



# Using Population Data

- Needed Data Elements:
  - What specific student characteristics should be included in the data set?
    - CTE Status
      - Is the student considered a CTE Participant, CTE Concentrator, some other CTE student status, or a non-CTE student
    - Other student characteristics of interest (all students):
      - Gender, Race, Ethnicity
      - Food Program Eligibility, Economically Disadvantaged Status
      - Special Education, Limited English Proficiency
      - Dropout Status, Graduation Status



# Strategies for Unlocking the CAR

- Data Diversification using:
  3. Auxiliary Data
    - Surveys
    - Enrollment Data
    - Course Offering Information
    - Statewide Longitudinal Data using (SLDSs)



# Using Auxiliary Data

- Surveys
  - Supplemental Student Information
    - Utilize student surveys to gain additional information for both CTE and non-CTE students
    - Can be used in conjunction with student educational records to examine measures student success, outcomes, etc. with only a sample of students



# Using Auxiliary Data

- Hypothetical Supplemental Student Information Survey Example:
  - National Center for Education Statistics' Educational Longitudinal Study of 2002
    - 27. How much do you agree or disagree with the following statements about why you go to school?
      - d. I go to school because education is important for getting a job later on.
        - » Strongly Agree – Strongly Disagree (4 point Likert scale)



# Using Auxiliary Data

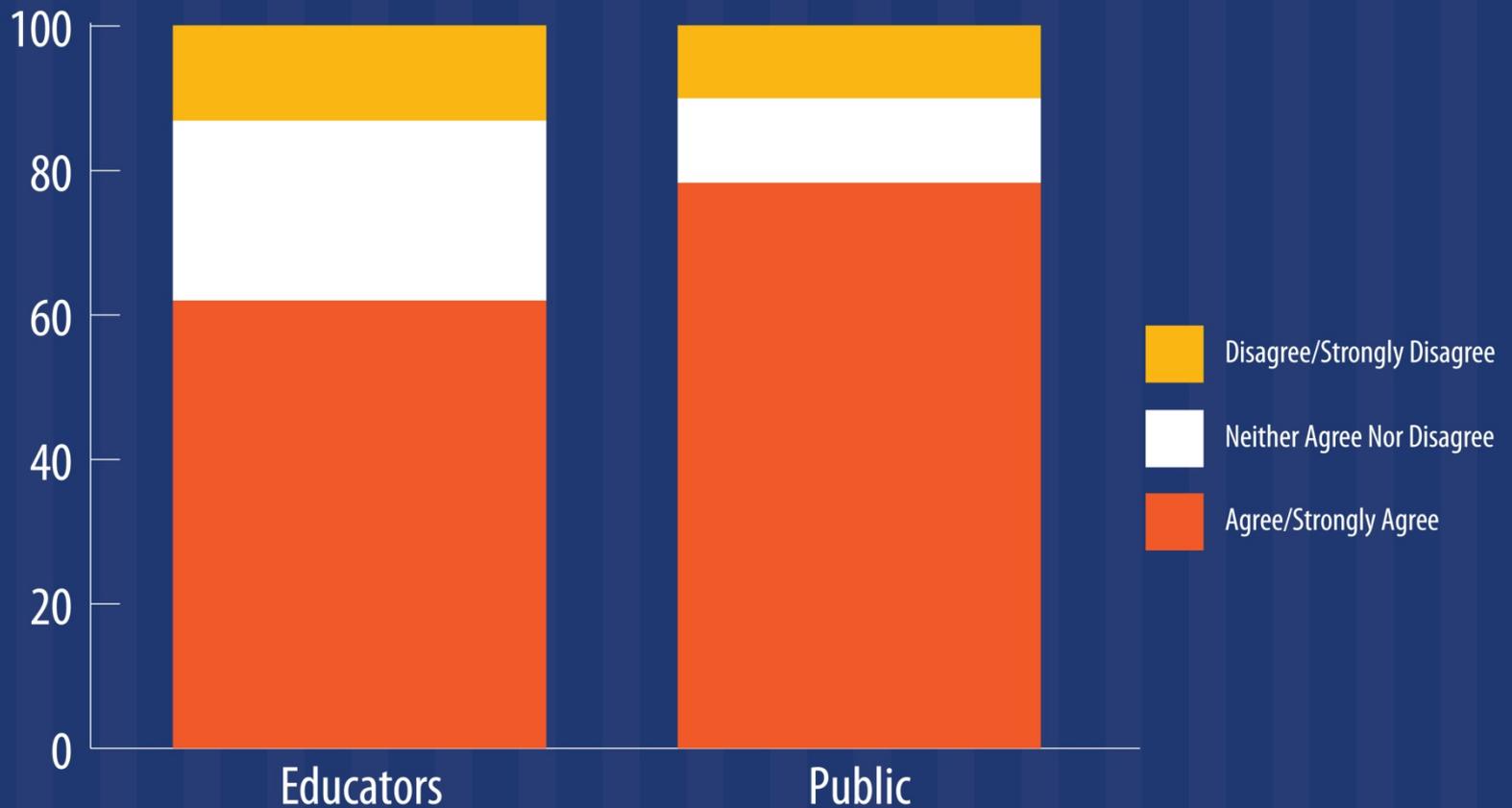
- Surveys (continued)
  - General population information (public opinion)
  - Educator information (teacher/administrator opinion)
  - Other key stakeholder information



# Using Auxiliary Examples

- General Population/Educator Information Survey Example:
  - Examining Public Perceptions of Career and Technical Education in Nebraska – Survey of General Public (July 2010)
  - Examining the Perceptions of Career and Technical Education in Nebraska – Survey of Educators (February 2010)





**Students who take CTE classes are better prepared for employment than students who do not take CTE classes.**

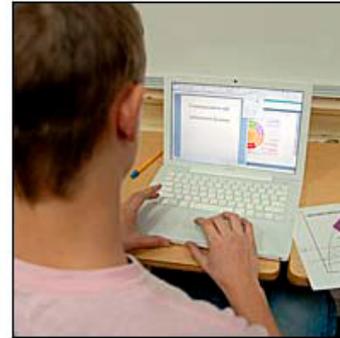




## Nebraskans want their children to have more information about careers.

In a recent study by the University of Nebraska Public Policy Center, 77.7% of Nebraskans said they believe students should begin to learn about potential careers in middle school—or earlier.

**That's what C4C-Curriculum for Careers is all about.** It's a Nebraska-focused program that helps middle school students learn more about career options—and the educational pathways that will lead them to the high-wage, high-skill, high-demand careers of the future.



[DISCOVER MORE ABOUT C4C-Curriculum for Careers.](#)

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# Using Auxiliary Data

- Hypothetical Enrollment Information Example
  - Trend analyses
  - Regional Analyses
  - Cluster Analyses
  - Relative to:
    - Labor Market Projections
    - Financial Investment
    - Program Enhancements



# Strategies for Unlocking the CAR

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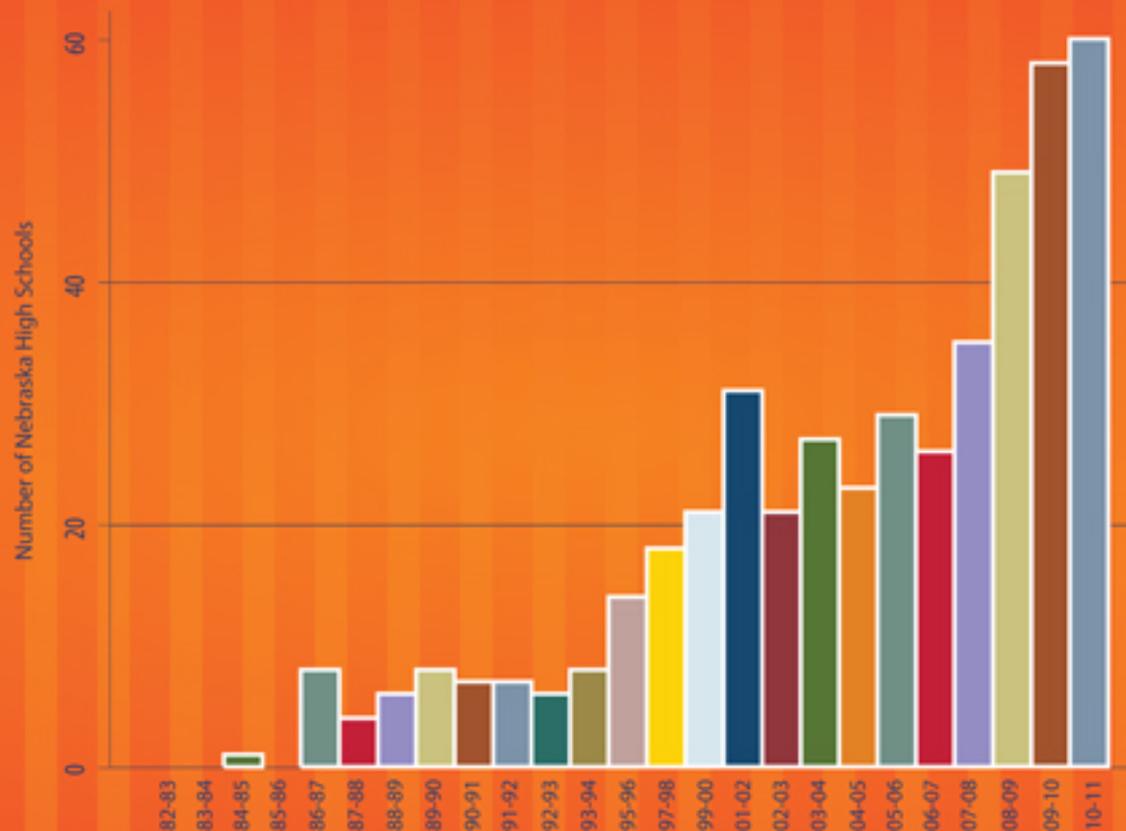


# Using Auxiliary Data

- Course Offerings Example:
  - A Longitudinal Analysis of Computer and Information Systems Programs in Nebraska: A 30-Year Evaluation of the NDE Curriculum Report



## Nebraska Career Education Programs: $>$ or $=$ 40 Instructional Units



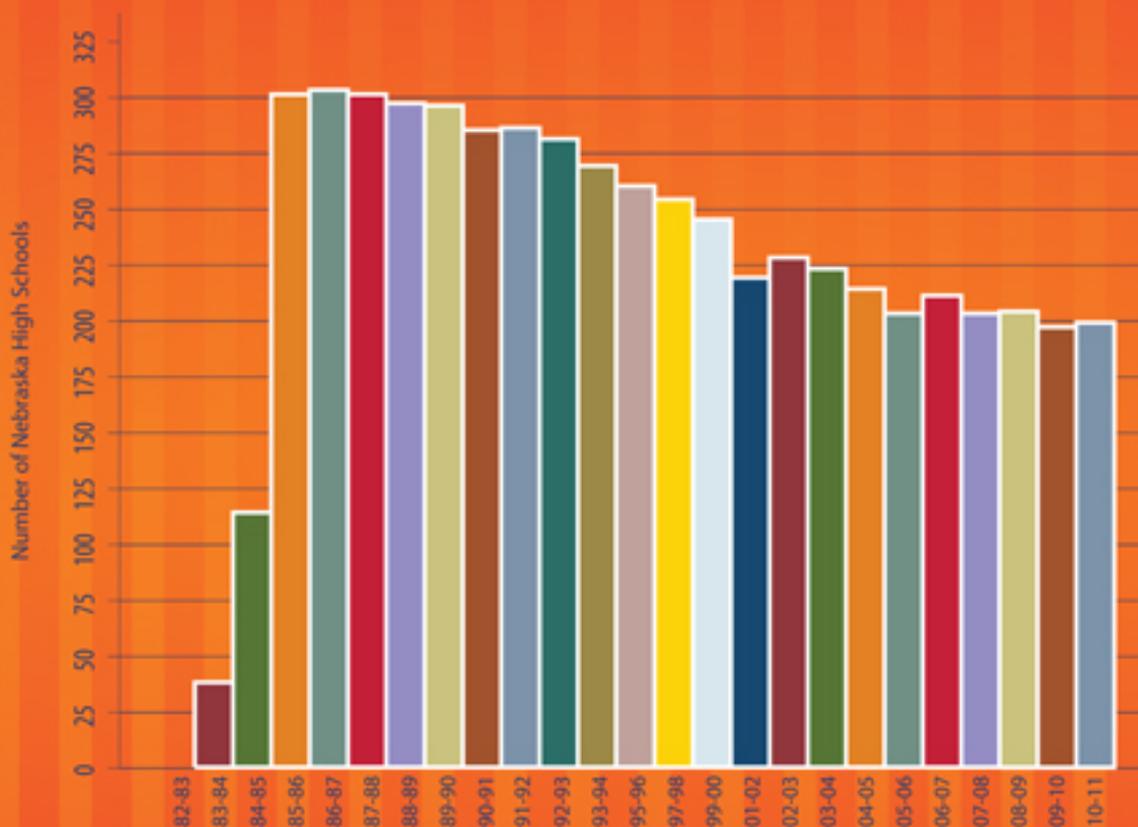
Communication and Information Systems



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## Nebraska Career Education Programs: < 40 Instructional Units



Communication and Information Systems



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# Strategies for Unlocking the CAR

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# Using Auxiliary Data

- Statewide Longitudinal Data Example
  - Coming soon...with the development of SLDS



# Using Auxiliary Data

- Needed Data Set:
  - For Surveys
    - Data set is obtained via the survey process
    - CAR data is not necessary – however, if surveying students and you want to disaggregate by CTE status, you will likely need a unique identification element to link survey data to existing education data, CAR or otherwise
      - For example, if you survey students about educational expectations and you want to analyze their responses by CTE status (participants vs. non-participants) or otherwise, you likely want to be able to match survey responses to educational data
      - Often using a unique education ID number (in advance)



# Using Auxiliary Data

- Needed Data Set:
  - For Enrollment Data
    - Choose your unit of analysis (student possible, often by school district, school building, or some larger geography of meaning)
    - Obtain enrollment information
      - Course (course code)
      - Subject or Career Cluster (subject / cluster code)



# Using Auxiliary Data

- Needed Data Set:
  - For Course Offering Information
    - Choose your unit of analysis (school district, school building, or some larger geography of meaning)
    - Obtain course offering information
      - Instructional Units, etc.
        - » Full-time programs
        - » Part-time programs
      - Longitudinal information
        - » Instructional units by school year, semester, quarter, etc.



# Using Auxiliary Data

- Needed Data Set:
  - For Statewide Longitudinal Data
    - A SLDS in your state, region
    - The data set is extracted from said system
    - Get engaged in the SLDS development in your state



# Using Auxiliary Data

- Needed Data Elements:
  - For surveys
    - If surveying students, likely a unique ID
    - For our purposes, data elements are likely those collected through the survey response process and can be combined with existing data using the aforementioned ID



# Using Auxiliary Data

- Needed Data Elements:
  - For Enrollment Data
    - Enrollment information (student head count) identifiable to the level of geography you expect (school building, district, etc.)
    - Further identified by
      - Course (course code)
      - Subject or Career Cluster (subject / cluster code)



# Using Auxiliary Data

- Needed Data Elements:
  - For Course Offering Information
    - Courses offered at the geography of your liking
    - Obtain course information
      - Instructional Units, etc.
        - » Full-time programs
        - » Part-time programs
      - Longitudinal information
        - » Instructional units by school year, semester, quarter, etc.
  - For Statewide Longitudinal Data
    - Ideally, an SLDS – data elements are system defined



For more information, please contact:

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Website:

<http://www.education.ne.gov/NCE/DRAW/index.html>

This presentation can be accessed at bottom of:

<http://www.education.ne.gov/NCE/DRAW/Statistics.html>



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