

# Towards a Typology of Reports for Educators

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# Essential Questions

- What is it?
- How is it made?
- How can it be used?
- What are some practical considerations?

# Why Should I Not Go For a Leisurely Stroll Right Now?

- Data, Evaluation, Assessment, and Research (D.E.A.R.) people
  - You may do something similar in the future if you are not currently
- District and School Administrators
  - You may need to know what to ask for from consultants or D.E.A.R. people
  - This may help inform how you conduct data digs

# What is an Assessment Typology?

**Across**

**Within**

**School**



**Grade**



**Class**



**Student**



# What is an Assessment Typology?

- A framework for:
  - Organizing reports
    - By aggregation (school, grade, class, student)
    - By perspective (across, within)
  - Conducting data digs
- At times interactive
  - To aid in organizing and selecting charts from the typology

# Why Create and Use a Typology?

- Convenient access to data
- Efficient reporting
  - Individual and in groups
- Structured data digs

For teachers and administrators:

- To shift focus from gathering, preparing, and displaying data to analyzing and using it.

# Ingredients

- An organized database
  - current and historical
  - Assessment and demographic data
- Business rules around
  - extracting, transforming, and loading data
  - Also for matching records
- Queries made in the database system where possible (this can significantly increase performance.)
  - i.e. joins, subsets of data

# Ingredients

- I use MS Access to query data
  - Joining tables
  - Reshaping tables
  - Initial filtering
- The visualization is based on the resulting data extract.
- This significantly improves performance.



# Ingredients

- FERPA Compliance
  - Row level security
  - User Table (Login – Section or UIC)
- Print on one 8.5in by 11in page where possible
- Subgroup filters
  - i.e. bottom 30%, LEP, Sp. Ed., etc...

# Ingredients

- Color coding of aggregations
  - School: blue
  - Grade: yellow
  - Class: red
  - Student: white
- Naming scheme
  - Name of assessment
  - Group (school, grade, or class)
  - Tab (perspective, aggregation, subject/strand, metric)
  - i.e. “ School Name (6<sup>th</sup>) - WIDA - Across – Grades – Subject – % Proficient”

# Ingredients

- View underlying data (where appropriate)
- Export
  - Pdf
  - Image (i.e. jpg)
  - Excel
- Scheduled auto updates of data
- Data source documentation
  - Including time stamp of data update

# How it Works

# Some Definitions

- Report
  - 2+ views pertaining to the same idea
- View
  - Dashboard
    - 2+ charts in one view
  - Chart
    - Table or graph

# Assessment data can yield many charts...



# Assessment Typology


	Across	Within
School	How do schools compare on one or more measures?	Which area(s) is/are of greatest concern for the school?
Grade	How do grade levels compare on one or more measures?	Which area(s) is/are of greatest concern for the grade?
Class	How do classes compare on one or more measures?	Which area(s) is/are of greatest concern for the class?
Student	How do students compare on one or more measures?	Which area(s) is/are of greatest concern for the student?

# Assessment Typology

	Across	Within
Class	How do classes compare on one or more measures?	Which area(s) is/are of greatest concern to the class?
Student	How do students compare on one or more measures?	Which area(s) is/are of greatest concern to the student?

**Within Student**

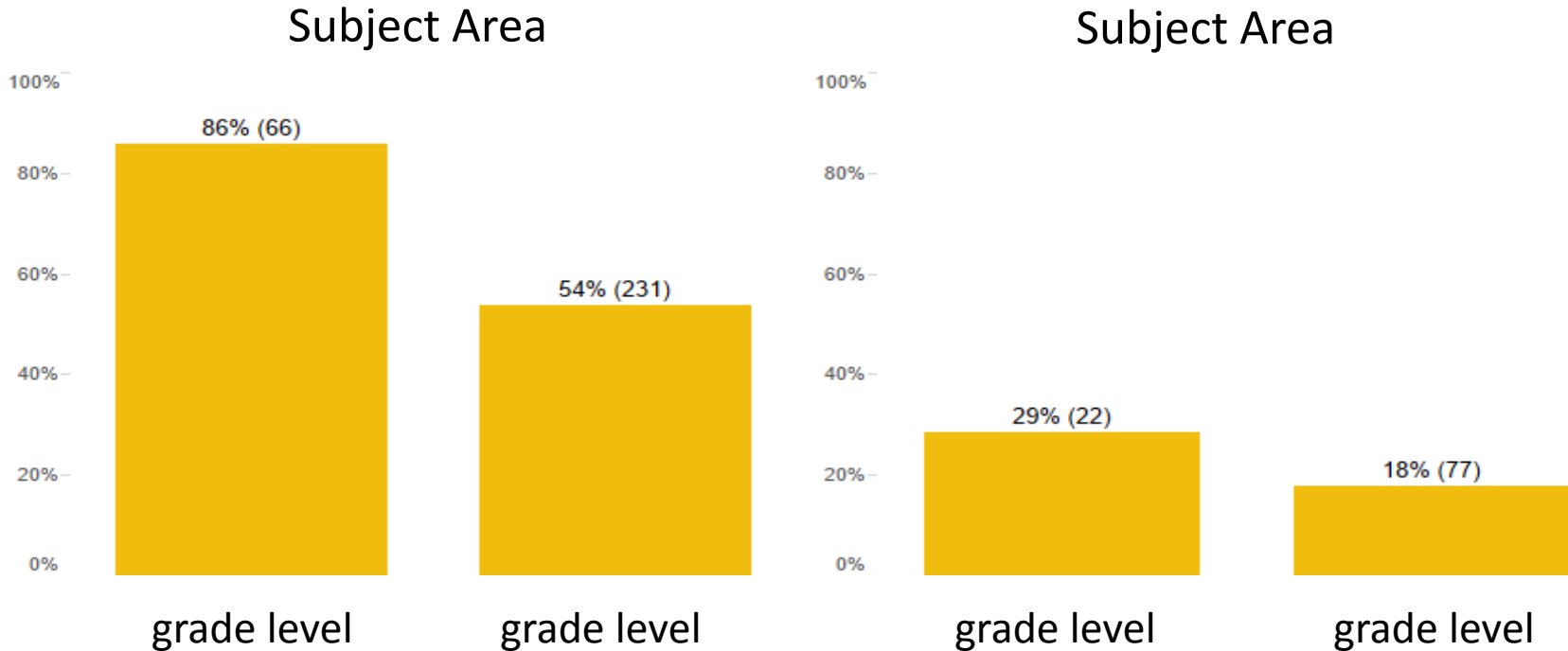
- ACT ▶
- Demographics ▶
- EXPLORE ▶
- MEAP ▶
- MME ▶
- PLAN ▶
- Scantron ▶
- WIDA ▶

Keep Only     Exclude    



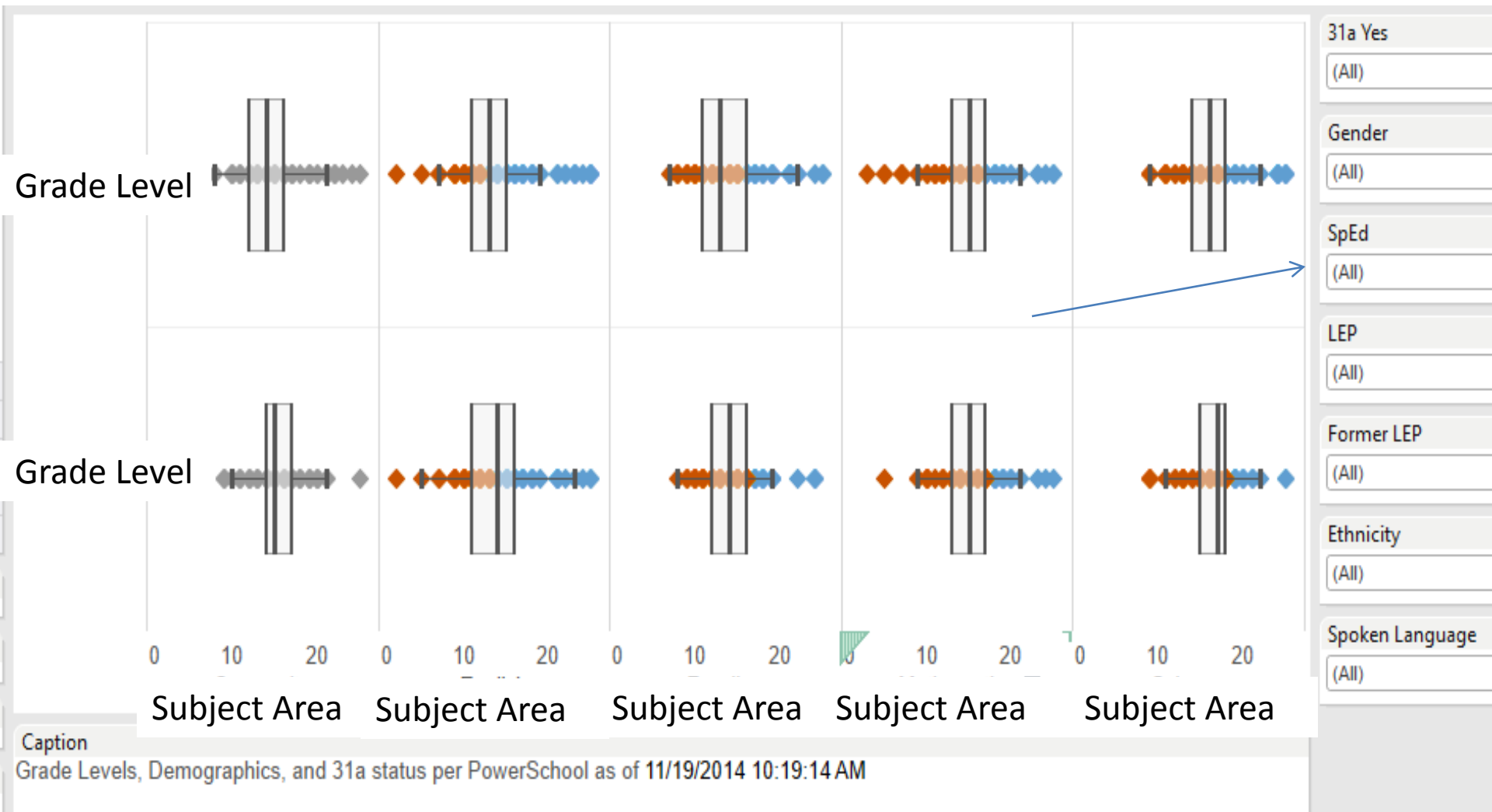
# Test Name: School, Grade – Across-Grades- Subject-Metric – Test Date

(Percent Proficient)

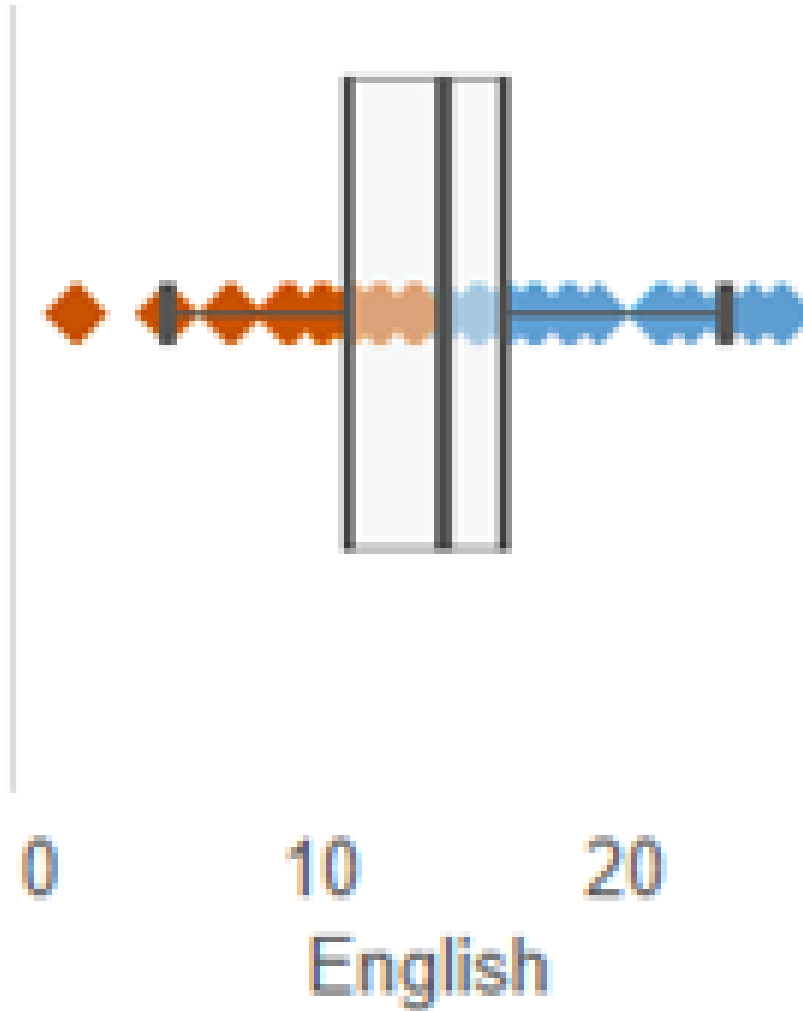


**Compare grades** on a set of results per subject, strand, unit, or skill

# Test Name: School, Grade – Across-Grades- Subject-Metric – Test Date

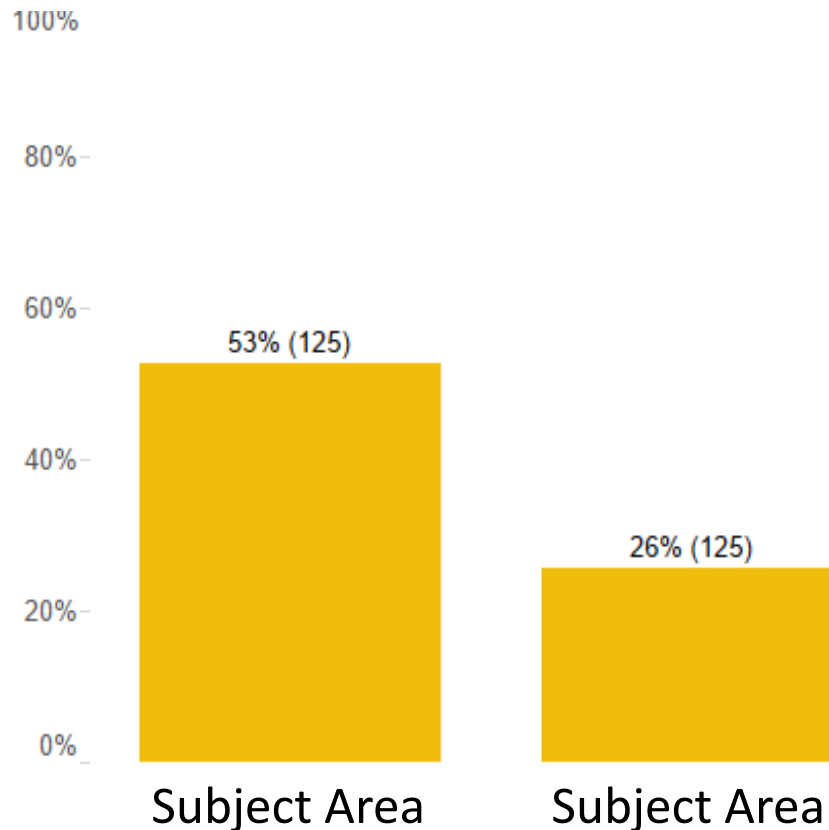


Red = not proficient; Blue = proficient



# Test Name: School, Grade – Within-Grade-Subject-Metric – Test Date

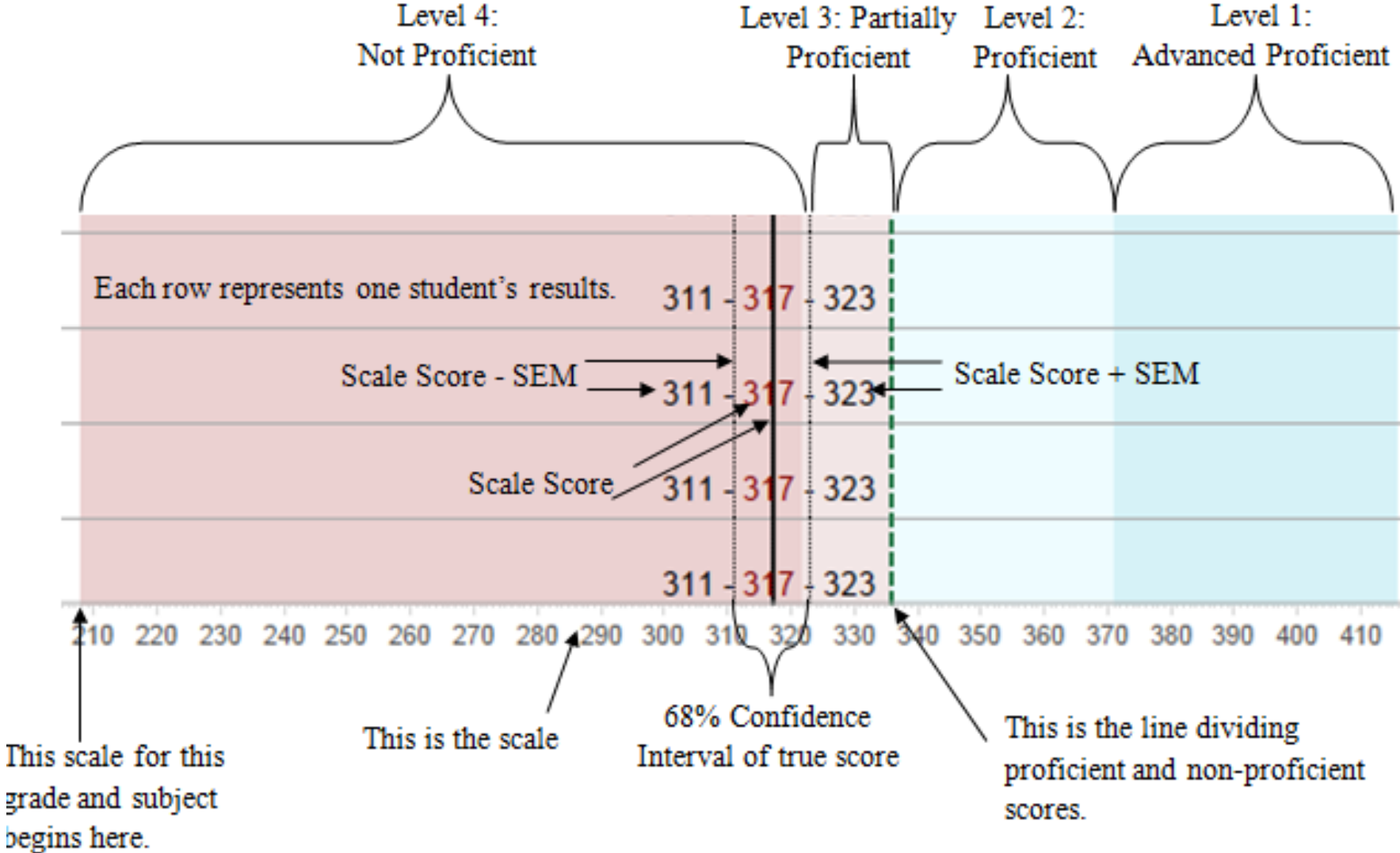
(Percent Proficient)



**Compare** a set of results per subject, strand, unit, or **skill within a grade.**

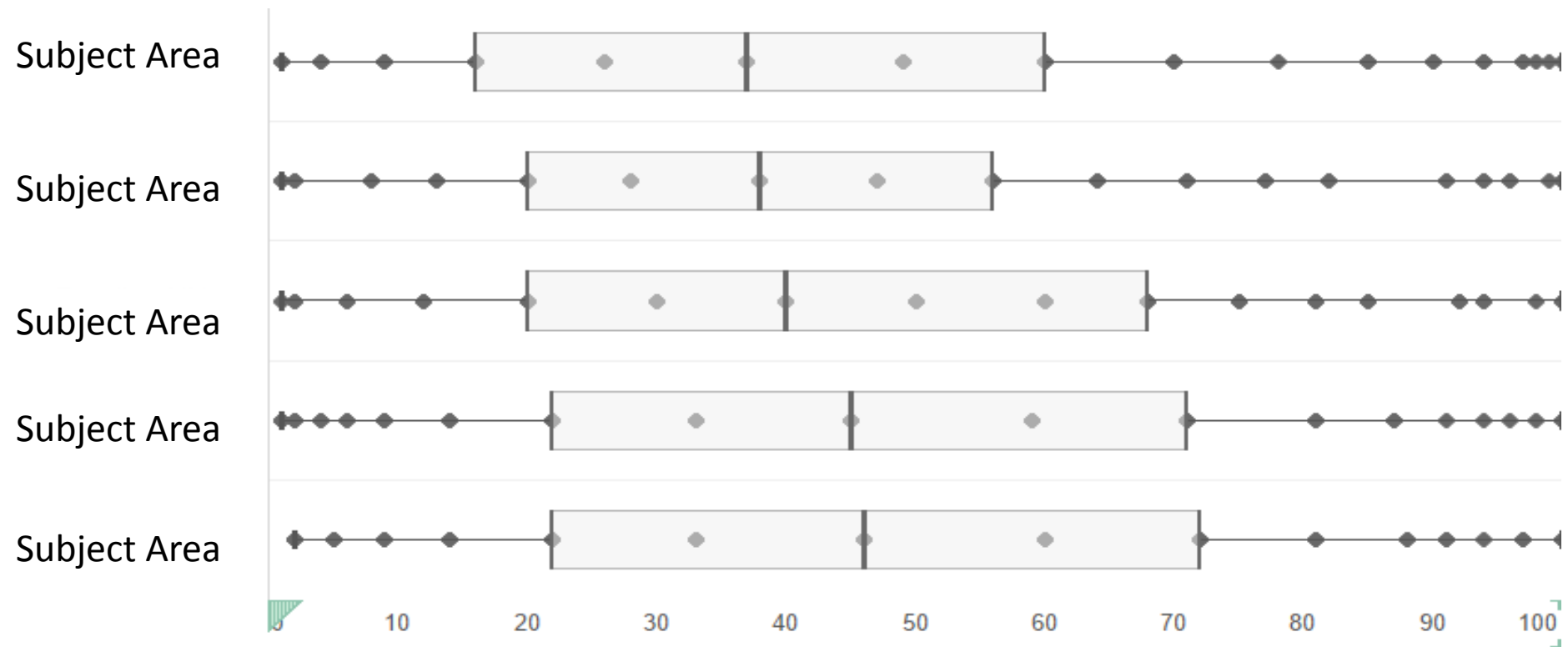
Where possible, the Standard Error of Measurement (SEM) will be displayed to convey the accuracy (or lack thereof) of the Scale(d) Score.

For example (MEAP Proficiency):



# Test Name: School, Grade – Within-Grade-Subject-Metric – Test Date

(Percentile Ranks)



Caption  
Demographics and 31a status per PowerSchool as of 11/19/2014 10:19:14 AM

**Across**

**Within**

**School**

Skill

Unit

Strand

Subject

**Grade**

Skill

Unit

Strand

Subject

**Class**

Skill

Unit

Strand

Subject

**Student**

Skill

Unit

Strand

Subject



# The Data Dig

- “Data Dig” meetings
  - Typology, cell by cell
  - Discuss findings
    - Notes → Planning
  - Track follow-up via Rubicon Atlas
    - New for this year
  - Use typology as a tool in to answer a larger question per Cho and Wayman (2014).



**Across**

**Within**

**School**

1

**Grade**

2

3

**Class**

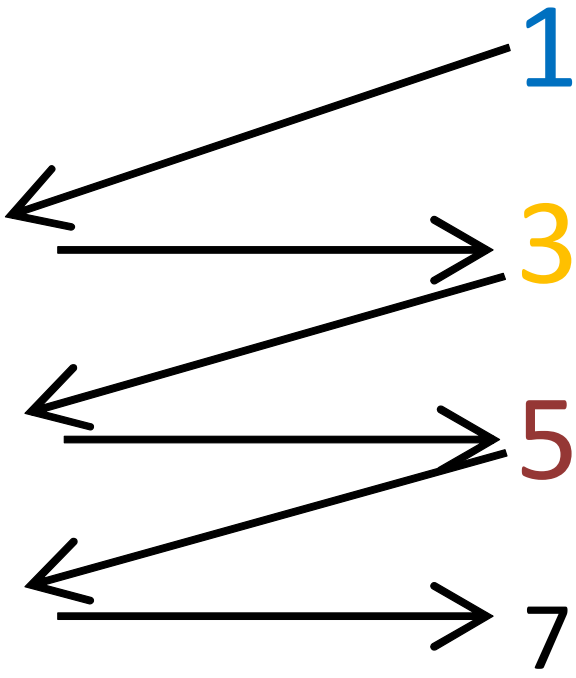
4

5

**Student**

6

7



# Practical Considerations

# Visual Design

- Evergreen, Tufte, Few, and others
- Regularize
- Data ink
- Prototype, get feedback, adjust
- Provide PD
- Post glossary of terms (embed link)
- Post explanations of complex views (embed link)

# Data

- Cut scores?
- Strand, unit, or skill results?

## Other layers:

- Overall
- Trend
- Subgroup (no student FRL per NSLA)

# Data

- % proficient?
- Mean/Median score vs. target?
- # of students tested
- # of students proficient
  - Or per performance level
- Distribution of scores
  - Box and Whisker Plot
  - Histogram

# Metrics

- Scale Score
- % Proficient
- (National) Percentile Rank
- Local Rank
- Standard Error of Measurement
- Performance Level (change)
- Grade Level Equivalency
- Other

# Some Notes on Inference

- More access to results = more inferences
- Educators need guidance
  - Normative vs. Criterion-Referenced Tests
  - Standard Error of Measurement (SEM)
  - Comparing subject scores on same scale
  - Thresholds of significant differences/relationships
  - Other statistical/psychometrical considerations
- Garbage in – garbage out
- See Bruce Fay's MAC Module (in references)

# Some Notes on Data Usage

- Cho and Wayman (2014): “Sensemaking”
  - Design and revisions of charts and typologies
    - Should be “bottom-up”
    - Should accommodate how educators work
- Explain how to interpret charts (i.e. Box and Whisker Plot)
- Outline next steps
  - Unit planning, curriculum, pacing, prioritizing



# Student Cohorts

- Intact per year (i.e. 2002-2003 5<sup>th</sup> graders)
- Across years (i.e. current 9<sup>th</sup> graders across time)
- Full Academic Year
- Currently enrolled
- All tested per window
- Resident District
- Length of enrollment
  - i.e. 3+ year vs. Newer
  - i.e. X+ year vs. Newer (with parameter X)

# Users

- *Central Office admin*
- *School admin*
- *Teachers who mentor others*
- Have accounts
- Made aware when new results come out
- Participate in data digs to get data for themselves and others (i.e. mentee teachers)

# Exceptions

- Sometimes assessment vendors produce results that are “close enough”
  - These can be used in data digs instead or in addition
  - The typology used same way in data digs
  - but non-interactive
- WIDA has a great reporting system
  - The manual is a great read!

# Exceptions

- Some high school teachers cannot be linked to their students by section due non-intact homerooms
- This requires linking by UIC and/or course ID

# What would be nice

- Automatically e-mail pertinent users when an update is made to a view or data source
  - I believe there is a way to do this, but I have yet to pursue it.
- Use an API to automatically get data from sites (i.e. BAA, Scantron) and dump the data into the database
  - Then auto-refresh
- A work-around is possible via Ruby Watir (<http://watir.com/>)
- Link user table to database maintained by principals/HR (in the works)

# Secondary Benefits

- Frees up time to ask more interesting and deep questions, which may be pursued via analytical software
- Gets the district one step closer pursuing more advanced analytics (i.e. decision trees, regression models, and maybe even predictive analytics)
- **Once cohorts and queries are in place, secondary analyses become easier and faster**

# Activity

- Given the above considerations, design a chart for the following:
  - MEAP
  - Within grade subject
  - Fall, 2013
  - Limited English Proficiency
- What are some ways in which this can be displayed?

# Activity

- You need to communicate whether or not students who stay at your building longer tend to do better in Math.
- Design a chart that might address this question.
- Share with members of your group.



# Activity (follow-up)

- How do you establish “students who have been with the school longer”?
  - What cut off dates did you use?
  - Why?
- 
- Questions?

# References

- Cho, V. & Wayman, J. C (2014). [Districts' efforts for data use and computer data systems: The role of sensemaking in system use and implementation.](#) *Teachers College Record*, 116(2).
- Fay, Bruce. (2011). *Building and Using Common Assessments: A Professional Development Series: Presenting Data Effectively*. Michigan Assessment Consortium: <http://mistreamnet.org/videos/788/presenting-the-results>
- Few, S. (2004). *Show me the numbers: Designing tables and graphs to enlighten*. Oakland, Calif.: Analytics Press.
- Tufte, E. (1983). *The visual display of quantitative information*. Cheshire, Conn. (Box 430, Cheshire 06410): Graphics Press.
- Wayman, J. C. & Jimerson, J. B. (2014). [Teacher needs for data-related professional learning.](#) *Studies in Educational Evaluation*, 42, 25-34. DOI: 10.1016/j.stueduc.2013.11.001.

# Thank-you!

- You've been great.
- Really.
- I mean it.
  
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