Turning Data into Information

Archived Information

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No Child LEFT BEHIND

Educators are constantly asked to turn Data into Information.

Consider the array of data that educators regularly confront:

- **State Proficiency Tests**
- **National Achievement and Ability Tests**
- **SAT, ACT, PSAT…etc.**
- **NAEP**
- **Diagnostic Assessments**
- **High Stakes Graduation Tests**

There are also:

- Classroom assessments
- Discipline records
- Attendance records
- Graduation rates
- Demographic data like gender, ethnicity,
- ...etc.

Educators are inundated with data, but this does not necessarily mean that they have information.

Data are Merely Numbers

To turn data into information, one must:

Organize the data

Describe the data

Interpret the data

Consider the Following Data
(Assume that these are test scores.)

Abby	24
Barry	30
Chloe	34
Dawann	28
Eric	28
Fred	14
Gerry	36
Hannah	32
Iyauna	30
Jason	28
Kathy	34
Liron	30
Murray	30
Nuran	26
Otis	22
Perry	24
Qiana	38
Riley	32
Sam	26
Tanya	40
Ulrich	28
Vanessa	32
Whitney	22
Yuri	26
Zoltan	36

Typically, our data ↑ looks like this.

We could compute the mean and the standard deviation for the class. Numerical displays are useful to the mathematically experienced, but….

Some educators are not comfortable with the algebraic operations that more traditional statistical analysis techniques require.

Some educators may not readily discern patterns of student performance in numerically summarized data.

Some educators find interpreting a set of numbers an abstract and unproductive process.

Graphical data analysis techniques are a different way to manage data.

In order for school-based educators to meaningfully organize and explore the voluminous amounts of data they are presented with each year, they need exposure to more *concrete* and *user friendly data analysis techniques.*

Moreover

For data analysis techniques to be valuable to educators, the techniques must enhance the chances that educators gain insight into student performance and that they translate this insight into improved educational experiences for children.

Graphical Data Analysis

Graphical data analysis methods are ideal for these purposes. Graphical data analysis methods provide school-based educators with concrete, clear and powerful exploratory techniques around which they can organize large and small sets of test scores into meaningful representations of their building and classroom realities.

Once educators have developed a concrete understanding of the concepts underlying the visual displays of information, a few well placed numbers, such as a mean, a median, or an interquartile range, can add specificity and depth to educators' understanding of the data.

Three good rules to follow when turning data into information:

1. When confronted with a set of scores, organize the scores numerically.
2. When comparing two or more sets of scores, place the scores on the same scale.
3. When graphing test scores, make sure the visual display is an honest and undistorted representation of the numerical test scores.

In creating good visual displays, it is important to:

1. Make sure the labels, titles and values on the visual display are so complete and clear that the display is understandable, independent of the narrative of the report.

2. Date every display.

3. Include the author's name on each display.

4. Identify the specific source of the data presented on the display.

5. Wherever possible, provide your audience with a context for the data and points of comparison. For example, you might discuss how the average of a particular class on some given task compared with the average for the entire district or how the same group of students performed in previous years.

Data Should Not Be Viewed in a Vacuum!

Stem-and-leaf plots are a particularly useful and user-friendly data analysis technique.

Stem-and-leaf plots help educators graphically, rather than mathematically, explore data in ways that can assist them in making meaningful instructional decisions based on factual information.

(This technique was developed by John Tukey, statistician emeritus Bell Labs, and is promoted by the Quantitative Literacy Movement.)

Landwehr and Watkins point out that exploratory data analysis techniques like stem-and-leaf plots are designed to help professionals reveal perhaps unexpected "*patterns and surprises*"* within sets of data.

*In their Preface to Exploring Data, Dale Seymour Publications, Palo Alto, 1986

Activity

Today we will use dot plots (which Landwehr and Watkins call line plots) and stem-and-leaf plots to explore a variety of data sets.

Let's locate our handout packet and begin to explore our topic, turning data into information.