Data Analysis & Reporting

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Introduction

Data collection is over; you have the data. But, now how can you make the most meaning of the information you have? First, you must analyze the data and second, you must be able to report on it in a way that makes sense to your audience. Often you might hear analysis and reporting used as though they were interchangeable terms. While both might draw upon the same collected data, analysis and reporting are very different in terms of their purpose, required skills, tasks, tools and value.

This eBook includes the following:

- Key Definitions

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What is Assessment?

Assessment is a systematic process to acquire an accurate, thorough, picture of the strengths and weaknesses of a program, department, or division.

Check out our other eBooks on Assessment!

Definitions

Data Analysis

Data analysis is the process of exploring data in order to extract meaningful insights.

Data Reporting

Data reporting is the process of organizing data into informational summaries in order to share with stakeholders.

Quantitative Data

Quantitative data is numerical data that can be specific or generalizable depending on the sample. Data can be measured through statistics and displayed through graphs and charts.

Qualitative Data

Qualitative data is data not in numerical form but that is descriptive in nature. Qualitative data is often collected by using methodologies such as interviews, focus groups, and surveys/evaluations with open-ended responses, making meaning from text and/or narrative.

Quantitative Data Analysis

Descriptive Statistics

Descriptive statistics is the term given to the analysis of data that helps describe, show or summarize data in a meaningful way such that, for example, patterns might emerge from the data. Descriptive statistics can help you understand the basic features of the data set that you are analyzing (Trochim, 2006).

Mean

- The average score
- Representative of every value in a data set
- Minimizes error in the prediction of any one value in a data set
- Influenced by outliers in the data, this is considered a main disadvantage

Median

- The middle score
- Less affected by outliers and skewed data

Mode

- The most frequently reoccurring score
- Used with categorical data to know which is the most common category
- Can be misleading when data is continuous or when the mode is far away from the rest of the data set

Standard Deviation

- The amount of variation or spread of scores within a set of data
- Used to make generalizations about the population from which your sample data set was derived

EXAMPLE

Student leaders answer a set of questions on a scale of 1-10 about their ability to lead a group. Using descriptive statistics you will be able to better understand the overall set of data that you have collected. This information could allow you to better understand how you can enhance or maintain student leaders abilities to lead others.

- Discovering the mean will allow you to understand the average rating that student leaders placed on their ability to lead a group. Knowing this you can determine how many scores fall above and below this average and gauge where each individual is in comparison to the group.

- The median would tell you what the middle most score was out of your entire set of data collected for each question asked. Knowing this would help you understand how evenly distributed your data set is by comparing the median to the mean. When they are not similar it is likely that the data set is either skewed to the left or right.

- The mode would tell you what the most frequently reoccurring score was for your student leaders for each question. Knowing this would improve your understanding of what the most popular ability rating is among your student leaders, where are most of them rating their ability to lead a group.

- Knowing the standard deviation for each question would allow you to understand how close or far away from the mean is each student's ability rating, i.e. is it one standard deviation different.

Inferential Statistics

Inferential statistics are techniques that allow us to use samples to make generalizations about the populations from which the samples were drawn. Inferential statistics are used to understand what the sample data set that you are analyzing could tell you about the population that it was drawn from (Trochim, 2006).

TIP

Connect with your campus institutional research or assessment office for training on how to effectively engage in analysis as and use campus-supported software.

T-Test

A T-Test allows you to compare average performance between to groups to determine if they are different from each other.

Analysis of Variance (ANOVA)

ANOVA is used to analyze difference among group means, it tells you if the means of several groups are equal and reduces the increased chance of a statistical type 1 error that is caused by running multiple t-tests.

EXAMPLE

Suppose that you were using the same set of leadership ability questions from the example above but you want to understand if there is a real difference in reported ability between first-year and second-year students. You could utilize a t-test to discover if there is a real difference, statistical significance, in scores between these two groups or if the difference is just due to chance.

Commonly Used Tools

IMB SPSS

SPSS is predictive analytics software that can be used to organize, clean, filter, sort and run statistical analysis on data sets.
 Click here to read more.

R

R is free software for statistical computing and graphics that can be used to organize, clean, filter, sort and run statistical analysis on data sets.
 Click here to read more.

Social Sciences Statistics

This web site currently features a number of statistical test calculators that you might find useful. The calculators are designed to be easy to use - normally requiring only that you input your data and press a button.
 Click here to read more.

Microsoft Excel

Microsoft Excel is a spreadsheet-based software that can be used to organize, clean, filter, sort, and compare data sets. This software is commonly available on computers provided by colleges and universities.
 Click here to read more.

Qualitative Data Analysis

Pre-Set Themes

Are determined based on your prior knowledge of the subject, research questions, problem areas, and conceptual framework. Creating this list is recommended to help guide the start of the coding process (Gibbs, 2007).

Emergent Themes

This set of themes or codes emerges from reading and analyzing the data. They are concepts, ideas, actions, and meanings that are different from the pre-set themes (Gibbs, 2007).

The Process of Coding

An easy way to think about coding is to see it as a process for organizing your data. Coding is essentially creating a set of organized files that are representative of a data set. To avoid confusion it is helpful to use words or short phrases as codes in your marginal notes. These notes will help to create a master codebook for a data set. Throughout the coding process you will naturally begin to refine the codes that have emerged by adding new codes or collapsing current codes into larger ones. You also might find that so much data is represented under a single code that sub-codes need to be used to make the data more manageable. The questions below are examples of guiding questions that you can ask yourself during the coding process (Gibbs, 2007).

- What is this saying?
- What does this represent?
- What is this an example of?
- What do I see is going on here?
- What is happening here?
- What is trying to be conveyed?

EXAMPLE

Your semester long program requires students to reflect using online discussion boards. At the end of the semester you organize each question and the responses to being the coding process. Based on the questions asked you can create pre-set themes to help guide the coding process. Throughout your coding process you add, combine, and create sub-themes for each of the questions to determine what the main takeaways from your program were for the student participants. Utilizing the organized list of themes you can determine if students met the intended learning outcomes for the program, as well as any extra outcomes that they might have developed from their experience in your program.

Telling the Story

It is important to think about the story that you want to communicate with your data and strategize how you are going to do this through the coding process. Coding without a strategy can cause lack of coherence and essential a waste of time. This is why it is so important to think about the purpose of your study and build such a strategy (Gibbs, 2007).

Commonly Used Tools

Paid Tools

NVivo

NVivo enables you to collect, organize and analyze content from interviews, focus group discussions, surveys, audio, social media, videos and webpages.
 Click here to read more.

ATLASti

Is a powerful qualitative data analysis program. You can explore, interconnect, and analyze in depth all your data sources - text, images, audio, video, and even geodata.
 Click here to read more.

Open Source Tools

Coding Analysis Toolkit (CAT)

CAT is a free service of the Qualitative Data Analysis Program (QDAP), and hosted by the University Center for Social and Urban Research, at the University of Pittsburgh, and QDAP-UMass, in the College of Social and Behavioral Sciences, at the University of Massachusetts Amherst. Click here to read more.

Text Analysis Markup System (TAMS)

It is a convention for identifying themes in texts (web pages, interviews, field notes).
 Click here to read more.

Transana

Transana is software for qualitative researchers who want to analyze video, auditory, and still image data.
 Click here to read more.

Data Reporting *(Adapted from Communicating Evaluation Results 2015)*

Selecting a Reporting Method

There are many ways to report your data, but it is important to remember the "less is often more." It is important to make sure your data is accessible and understandable to your audience.

Common questions you might ask yourself when selecting a reporting method:

- Who is your audience?
- Are there multiple audiences?
- What type of information does your audience need and why do they need it?
- What could be the possible uses of the information?
- When is the most critical time for the audience to have the information?
- What would be the most helpful way to display the information?

Printed Reports

Written reports can be comprised of abstracts and briefings, annual reports, fact sheets, empirical publications, and newsletters.

Oral Reports

Oral reports include verbal presentations of the findings.

Visual Reports

These methods of reporting include presentations, exhibits, news releases, and posters.

Digital Reports

Digital reports are shared through the Internet and can be a dedicated website or virtual issue of a publication that showcases data findings.

Commonly Used Tools

Microsoft Excel

Microsoft Excel is a spreadsheet-based software that can be used to create summary tables, charts, and graphs for data reporting.

Adobe Photoshop/InDesign

Both of these Adobe products are graphic design software used for the creation of digital images.

Microsoft PowerPoint or Apple Keynote

Both of these software programs are utilized to create visual slide decks of findings from data analysis.

PiktoChart

A low cost, easy to use online tool for creating info graphics.
Click here to read more.

Conclusion

There are many tools designed for and ways to conduct data analysis. Reporting findings or dominant themes can also be done using different tools to create reports and shared in variety of ways. Knowing this, it is important to partner with individuals who know how to use statistical software for data analysis or know how to engage in data analysis and reporting.

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