Welcome to the Art & Science of Data

This session will begin shortly!

Session Reminders:
- Remain muted
- Share video
- Use chat for questions during the presentation
- Complete the survey
- Reminder to follow-up with presenter for additional q's

The Art & Science of Data - January 13, 2021

MEANINGFUL ANALYSIS

UNM Office of Assessment & APR

Julie Sanchez & Charla Orozco

Presentation Layout

- What do we mean by Meaningful Analysis?

- Getting started (and pre-getting started)

- Things to consider

- Example with data from the assessment of the UNM General Education program

- Questions

Meaningful Analysis

- Analysis that provides results that can be useful in the decision-making process – or otherwise returns useful results.
    - Satisfies the intended audience
    - Answers questions
    - Meets goals
    - Illuminates next steps, strengths, limitations
    - Leads to recommendations

Who is your audience?

What are the key takeaways?

How will you communicate the message?

What questions are being answered?

TELLING YOUR STORY

Before you get started

1. Get to know your data! (pivot table, summary stats, read through it – does it make sense?)

2. Clean your data – get your data ready for analysis
    - How do you want to handle incomplete responses?
    - What about answers that do not belong?
    - Are there questions that you can group together as being part of a larger theme or topic?
    - Are there questions that you can prioritize?

3. Pick your analysis software – Excel, SAS, STATA, R, etc.

Start analysis

1. Run summary stats (may have been part of getting to know your data but repeat with clean data)

Descriptive Stats

- Count,
- Frequencies,
- Median, mean, mode
- Percentages

Demographics

- What do the demographics show about your respondents?
- Did different groups show different results?

Start analysis part 2

Approach 1: Analyze the questions that matter **most to your stakeholders**, then everything else

Approach 2: Determine your **own analysis plan**

More on approach 2

If you have a blank slate in analysis process:

Return to the goal of the survey/data collection

Can you group the questions into themes or topics?
- what kinds of patterns and trends emerge per theme/topic?
- dig deeper where necessary – which subsets of the data may be helpful?

Things to consider:

1 Aggregate Data

What do you see overall with the numbers?

Did the numbers answer your questions?

2 Grouping

In what ways can you chunk your data to tell the story of your results?

Is the story different when you group the data?

3 Patterns/Trends

Within your groups, are there patterns or trends?

Do they provide context for the data points?

Things to consider (continued):

It's very easy to get lost in big data and find ourselves analyzing every question and falling short on building a story – when it starts to happen, step back and ask yourself how the data from the question you're looking at will contribute to the bigger picture.

Meaningful Data Analysis - The Art & Science of Data

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Things to consider (continued):

Before completing your analysis, ask yourself:

- What does the data confirm?
- What is new from the data?
- What is unexpected from the data?
- What data do I want to dive deeper into?
- How does this data serve the intended purposes?

- Did my instrument bring valuable data? Are there changes that need to be made to the instrument next time?

- Are my conclusions objective/subjective? Did I come in with a hypothesis or assumption that I've proved/disproved?

- Before finalizing my conclusions, who else should interpret? What other eyes do I want on this?

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Example

Data from the General Education Program

UNM General Education Assessment AY 19-20

Following a restructuring of General Education by the NMHED, all post-secondary institutions are required to assess essential skills that students are expected to develop over time.

Communication

Quantitative Reasoning

Critical Thinking

Personal & Social Responsibility

Information & Digital Literacy

UNM assessed four of the five Essential Skills during the pilot year using individual skill rubrics; selected faculty were tasked with student artifact selection and submission of these artifacts to the UNM Office of Assessment & APR (OA/APR).

Artifacts served as representative samples of each assessed skill, and were rated with the following rubrics: 0= No evidence; 1= Emerging (beginning college-level); 2= Developing (completing gen ed-level); and 3= Proficient (completing B.A./B.S.-level)

725 student artifacts submitted

from **570** students

79% from 1000-level courses

21% from 2000-level courses
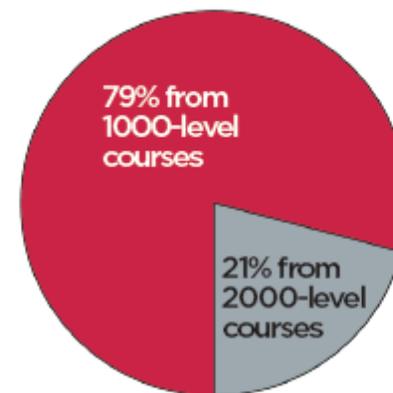
Course Modality:

60% Face-to-Face

24% Online

16% Hybrid

Communication

2.12
overall average rating

Rubric Dimensions:

Genre and Disciplinary Conventions

Strategies for Understanding and Evaluating Messages

Evaluation and Production of Arguments

Personal & Social Responsibility

1.58
overall average rating

Rubric Dimensions:

Inter-cultural Reasoning and Inter-cultural Competence

Sustainability and the Natural and Human Worlds

Ethical Reasoning Collaboration Skills, Teamwork and Value Systems

Civic Discourse, Civic Knowledge and Engagement
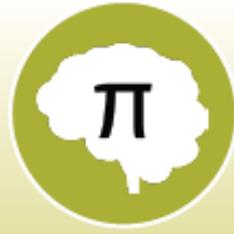
Quantitative Reasoning

2.04
overall average rating

Rubric Dimensions:

Communication and/ or Representation of Quantitative Information

Analysis of Quantitative Arguments

Application of Quantitative Models

Information & Digital Literacy

.89
overall average rating

Rubric Dimensions:

Authority and Value of Information

Digital Literacy Information Structures

Research as Inquiry

Critical Thinking

Will be assessed in 2021

Rubric Dimensions:

Problem Setting

Evidence Acquisition

Evidence Evaluation

Reasoning/Conclusion

Ratings are indicative of many variables, including student performance, alignment of the course assignment, assessment rubric, and selected rubric dimension. OA/APR will be working with campus partners to help equip instructors with essential skill development in their courses.

Our Approach

- Mix of approach 1 and 2
  - Had stakeholders who had specific questions
  - Had our own analysis plan

- Broke our data into several themes/groups
  - College/School/Branch
  - Essential Skill
  - Course Level
  - Intersectional Combination

Conclusions

Meaningful analysis brings:

- o Next steps
- o Answers and new questions
- o Instrument information
- o Population information
- o A context to numbers
- o A STORY

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Resources

Office of Assessment & APR Virtual Workshops:
- Introduction to Data Viz – Friday, March 5
- Meaningful Data Analysis (part 2) – Friday, April 9

- Data Cleaning tutorial: https://youtu.be/LSm_rS8-6QM or a longer one here: https://youtu.be/EwmuaqnoaKs
- Pivot Tables tutorial (parts 1-3 are great): https://youtu.be/9NUjHBNWe9M
- Survey Analysis in R tutorial: https://youtu.be/ROva_UcFIQM
- Survey Analysis in STATA tutorial: https://youtu.be/0DRXnoR-Q1c
- Survey Analysis in SAS tutorial: https://youtu.be/dQUF3Usqtks

THANK YOU!

Questions/Comments?

Email: **assess@unm.edu**