

Data Collection: Sampling

- Why sampling:
 - Manageable to collect and evaluate
 - Robust sampling → stronger conclusions
- Considerations
 - What is the tolerable [margin of error](#)
 - How many work can faculty handle

Random Sampling

Scenario: Collect 200 student papers from 8 senior writing courses → randomly select 50 (25%) to evaluate



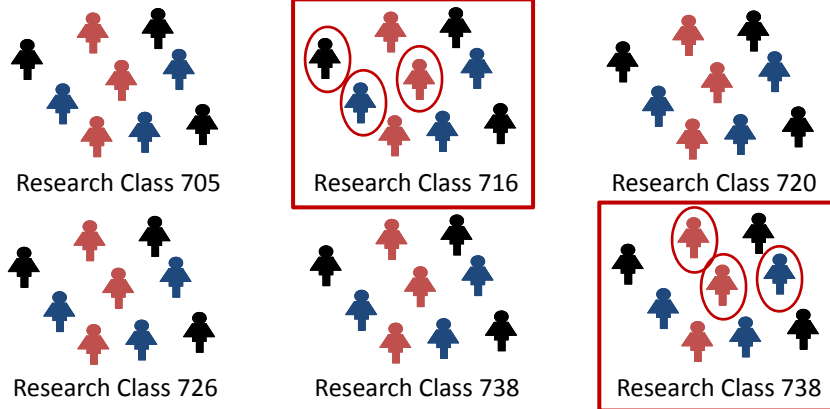
Cluster Sampling

Scenario: Collect all student research papers from several randomly selected research classes

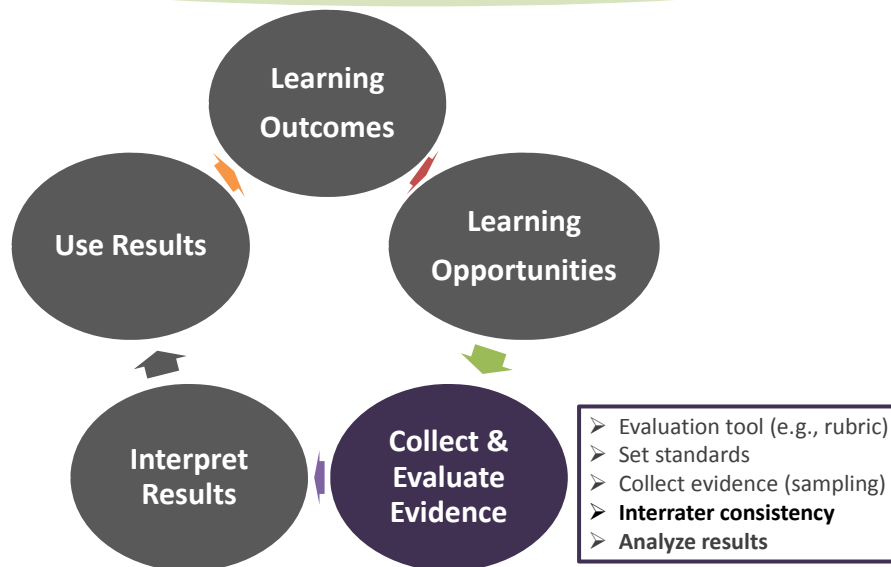


Cluster + Random Sampling

Scenario: randomly select several student research papers from randomly selected research classes



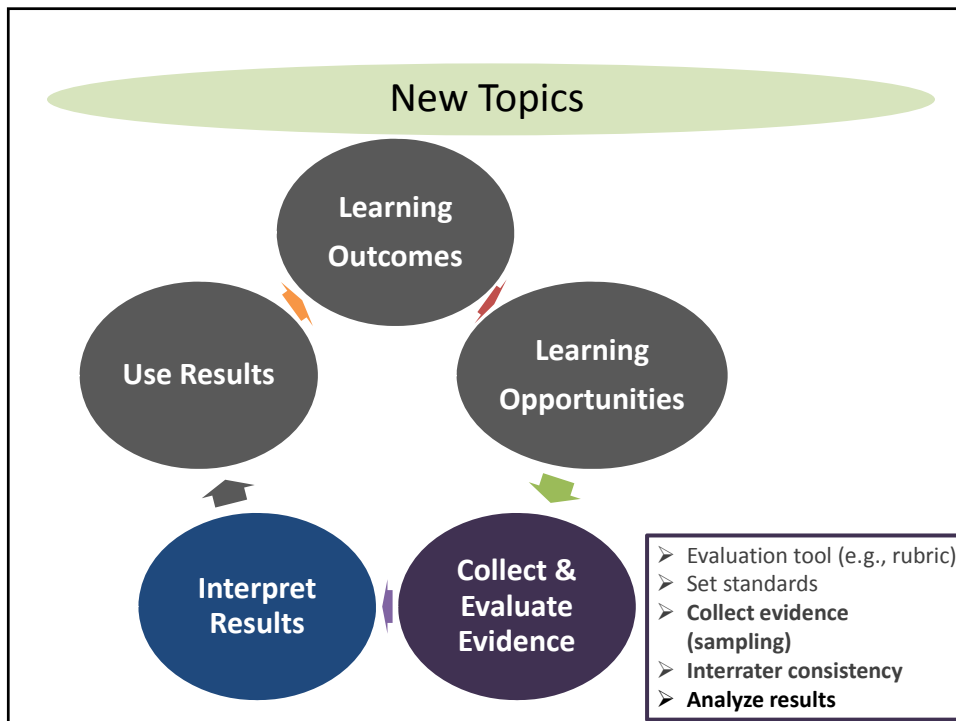
Next Topic



Inter-rater consistency

- Inter-rater agreement:**
how many pairs of raters gave exactly the same score?
70%

| | A | B |
|----|---------|---------|
| 1 | Rater 1 | Rater 2 |
| 2 | 1 | 1 |
| 3 | 1 | 2 |
| 4 | 2 | 2 |
| 5 | 2 | 2 |
| 6 | 2 | 3 |
| 7 | 2 | 3 |
| 8 | 3 | 3 |
| 9 | 3 | 3 |
| 10 | 3 | 3 |
| 11 | 3 | 3 |



Learning Outcomes

Participants are able to apply a data summarization technique that is appropriate for reporting purpose and audience

Agenda

- Planning a summary and an analysis
- Basic ways to summarize data
 - Achievement question (from 1 or more data sources)
 - Change over time
 - Difference between groups
 - Summarizing comments/open-ended responses
- Principles of data presentation
- Reporting language

Planning a Summary & an Analysis

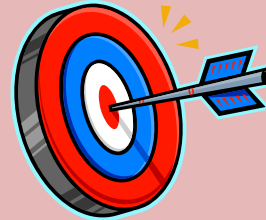
- Questions to be answered



- Audience



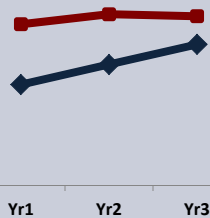
- Standards or Benchmarks



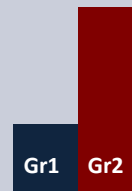
? Questions to be Answered



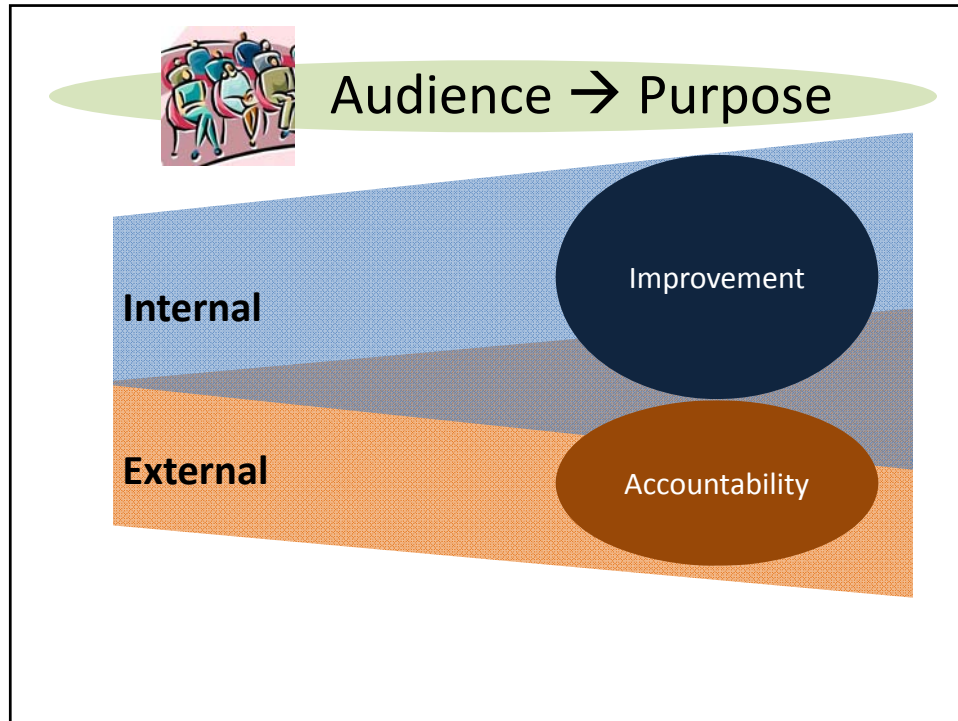
Achievement



Change over time



Difference between groups



Standards/Benchmarks

- 80% of the students will achieve the minimum performance level on all outcomes
- The average score on the national licensure exam will be above national average

Basic Ways to Summarize

1. Tallies/Counts
2. Percentages
3. Averages
4. Summary of themes in texts

Tallies

| Outcomes | Below Expectation | Approaching Expectation | Met Expectation | Exceeded Expectation |
|--------------------------------|-------------------|-------------------------|-----------------|----------------------|
| 1. Appropriate use of sources | 20 | 10 | 50 | 20 |
| 2. Well synthesized literature | 10 | 20 | 60 | 10 |
| 3. Sound methodologies | 15 | 5 | 55 | 25 |
| 4. Appropriate analysis | 5 | 15 | 65 | 15 |
| 5. Correct interpretation | 5 | 5 | 50 | 40 |

N=100 students

Tallies

| Through the workshop, I learned how to | Strongly disagree | Somewhat disagree | Somewhat agree | Strongly agree |
|--|-------------------|-------------------|----------------|----------------|
| 1. Use guiding questions in data analysis | 20 | 10 | 50 | 20 |
| 2. Use descriptive statistics in data summarization | 10 | 20 | 60 | 10 |
| 3. Choose data presentation table appropriate for audience | 15 | 5 | 55 | 25 |
| 4. Summarize achievement from a single source of data | 5 | 15 | 65 | 15 |
| 5. Summarize achievement from multiple sources of data | 5 | 5 | 50 | 40 |

N=100 students

Percentages

| Outcomes | Below Expectation | Approaching Expectation | Met Expectation | Exceeded Expectation |
|--------------------------------|-------------------|-------------------------|-----------------|----------------------|
| 1. Appropriate use of sources | 20% | 10% | 50% | 20% |
| 2. Well synthesized literature | 10% | 20% | 60% | 10% |
| 3. Sound methodologies | 15% | 5% | 55% | 25% |
| 4. Appropriate analysis | 5% | 15% | 65% | 15% |
| 5. Correct interpretation | 5% | 5% | 50% | 40% |

Total number of papers rated = 100

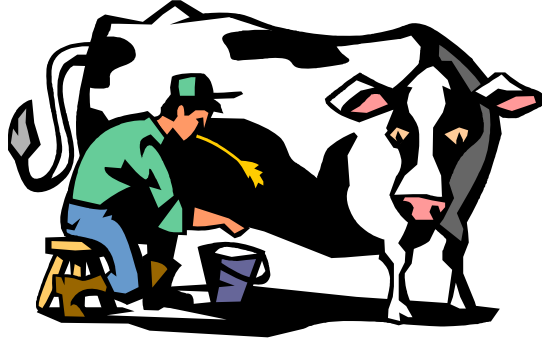
Percentages

| Through the workshop, I learned how to | Strongly disagree | Somewhat disagree | Somewhat agree | Strongly agree |
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| 1. Use guiding questions in data analysis | 20% | 10% | 50% | 20% |
| 2. Use descriptive statistics in data summarization | 10% | 20% | 60% | 10% |
| 3. Choose data presentation table appropriate for audience | 15% | 5% | 55% | 25% |
| 4. Summarize achievement from a single source of data | 5% | 15% | 65% | 15% |
| 5. Summarize achievement from multiple sources of data | 5% | 5% | 50% | 40% |

Total number of respondents = 100

Averages for Test Scores

| Scientific Method (Average = 85%) | |
|--|------------------------|
| <u>Item</u> | <u>Average % Score</u> |
| Item 1 | 80% |
| Item 4 | 90% |
| Item 7 | 80% |
| Item 10 | 90% |
| Quantitative Reasoning (Average = 43%) | |
| <u>Item</u> | <u>Average % Score</u> |
| Item 2 | 20% |
| Item 3 | 30% |
| Item 6 | 80% |



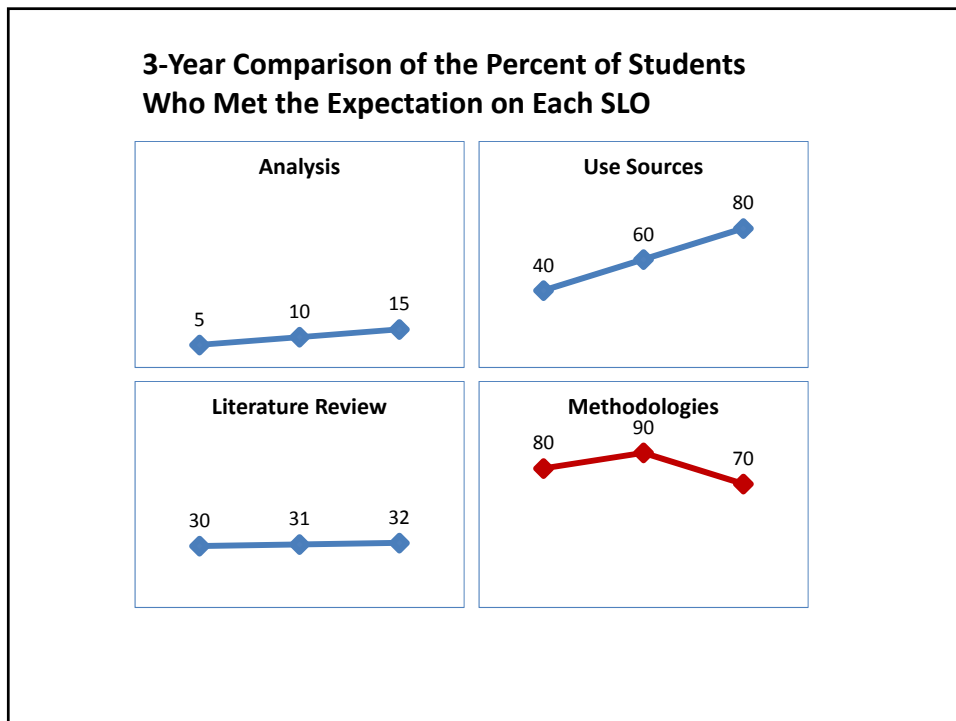
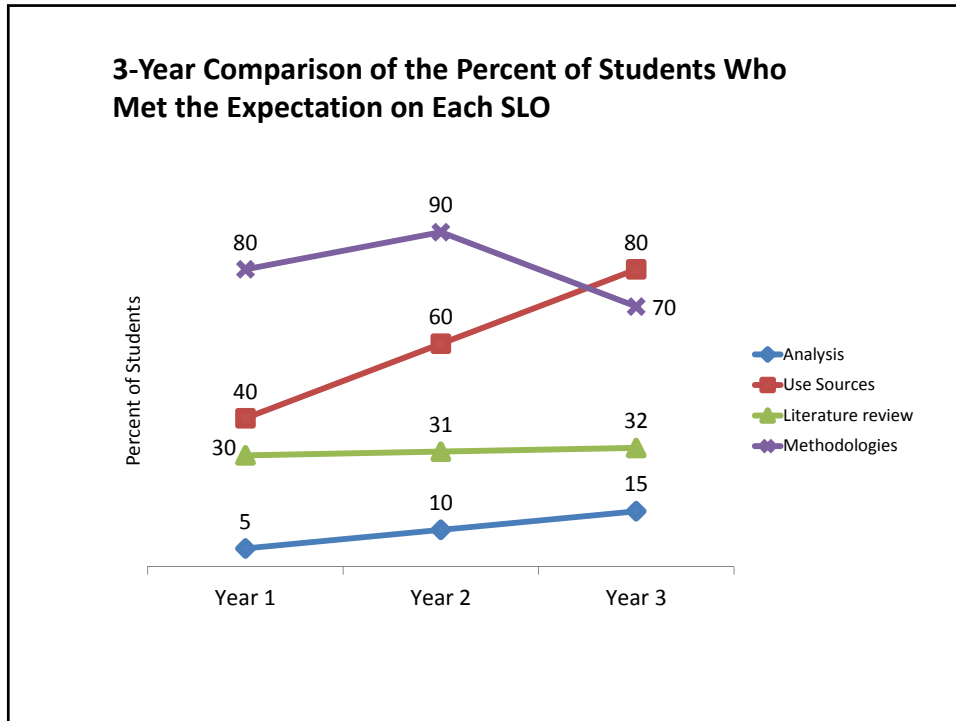
**SUMMARIZING ACHIEVEMENT WITH A
SINGLE DATA SOURCE
(TASK A & B ON HANDOUT)**



**SUMMARIZING ACHIEVEMENT WITH
MULTIPLE DATA SOURCES
(TASK C ON HANDOUT)**

CHANGE OVER TIME

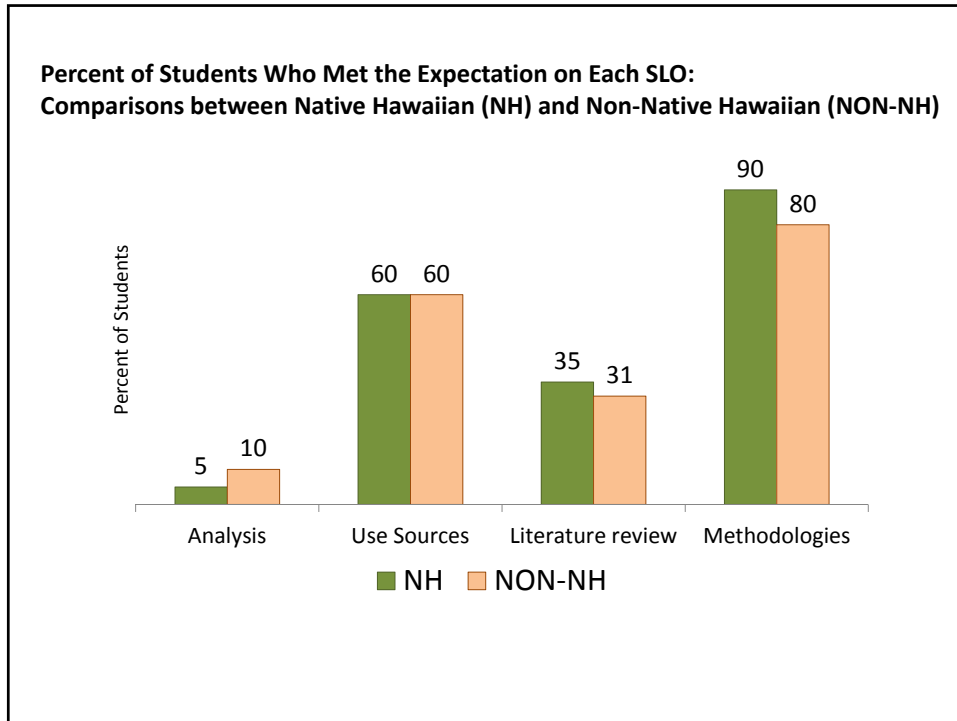
| Outcomes | Year 1 % met | Year 2 % met | Year 3 % met | 3-year change |
|-------------------------------------|-----------------|-----------------|-----------------|------------------|
| Appropriate analysis (SLO 4) | 5 | 10 | 15 | 300% |
| Appropriate use of sources (SLO 1) | 40 | 60 | 80 | 100% |
| Well synthesized literature (SLO 2) | 30 | 31 | 32 | 7% |
| Sound methodologies (SLO 3) | 80 | 90 | 70 | -13% |



DIFFERENCE BETWEEN GROUPS

| Writing Outcomes | Native Hawaiian n = 60 (% met) | Non-Native Hawaiian n = 120 (% met) | Difference* |
|-------------------------------------|--------------------------------------|---|-------------|
| Appropriate analysis (SLO 4) | 5 | 10 | -5% |
| Appropriate use of sources (SLO 1) | 60 | 60 | 0% |
| Well synthesized literature (SLO 2) | 35 | 31 | 4% |
| Sound methodologies (SLO 3) | 90 | 80 | 10% |

* Difference is % *met* in the Native Hawaiian Group minus the % *met* in the Non-Native Hawaiian group



A Brief Review

- Three guiding questions
 - Achievement
 - Change over time
 - Difference across groups
- Three basic statistics
 - Tallies/Counts
 - Percentages
 - Averages
- Considerations
 - Audience
 - Useful for decision-making
 - Benchmarks
- Source
 - Single
 - Multiple

SUMMARY OF THEMES

Text Data

- Open-ended survey questions
- Focus group records
- Reflection papers
- Student feedback minute papers

Theme Summary Strategies

- Narrative of trends and patterns
- Grouped listings
- Theme and category counts + quotes

Narrative of Trends and Patterns

Example

*“The most **prominent** suggestion raised by the participants is to increase the length of the workshop, **followed by** the suggestion to post the material online. **A few** participants mentioned the following . . .”*

Narrative of Trends and Patterns

Useful phrases to use in a report:

- “The greatest strength of the department recognized by the respondents is . . .”
- “XXX is another common theme raised by the students.”
- “The main issues mentioned are . . .”
- “The most prevalent theme/factors are . . .”
- “To a lesser extent, X and Y are mentioned.”

Narrative of Trends and Patterns

Analysis Strategies

- Quick read-throughs
 - Random sampling to make it manageable
 - Find a peer to do it too – member check
- Thematic analysis
 - Refer to the resource list

Group Listings

Example 

What was the one thing you learned in this workshop that you'll find most useful?

Rubrics (13 comments)

- Characteristics and advantages of different types of rubrics
- Descriptive rubrics seemed useful
- Examples of rubrics
-

Multiple Choice (9 comments)

- Creating multiple-choice questions
- The criteria for writing good MC tests
- Tips for writing multiple choice
-

Self-Reflection (5 comments)

- Reflective writing-I think these will be most useful.
- The self-reflection info will really work for my students.
-

General and Miscellaneous (3 comments)

- Great tips and tools
- How to process and assess the assessment tools we use
- That assessment encompasses test design and grading

Grouped Listings

Considerations

- Use when statements fall into a few discrete categories.
- Mind the unit of analysis: comments or people?
- Still need to interpret: *“Participants mentioned rubrics most often as the most useful thing they learned at this particular workshop, with multiple-choice tests coming in second.”*

Theme/Category Counts + Quotes

Table X. Most Useful Workshop Elements

| Categories | Count of Comments | Quotes |
|----------------------------------|-------------------|--|
| Rubrics | 13 | <ul style="list-style-type: none">- <i>Characteristics and advantages of different types of rubrics</i>- <i>Creating rubrics is an excellent collaborative exercise by which department colleagues establish common goals</i> |
| Multiple Choice | 9 | <ul style="list-style-type: none">- <i>The criteria for writing good MC tests</i>- <i>Creating multiple-choice questions</i> |
| Self-Reflection | 5 | <ul style="list-style-type: none">- <i>Reflective writing-I think these will be most useful.</i> |
| General and Miscellaneous | 3 | <ul style="list-style-type: none">- <i>Mahalo for the coffee and snacks</i> |

Theme Summary Strategies

- Narrative of trends and patterns
- Grouped listings
- Theme and category counts + quotes

Review

Considerations

Techniques

- Tallies
- Percentages
- Averages
- Summary of themes



Source

- Chapter 16 Summarizing and Analyzing Assessment Results in Suskie, L. (2009). *Assessing student learning: A common sense guide*. (2nd ed.) San Francisco, CA: Jossey-Bass.

Tips in Presentation

- Sort the results in a meaningful order
- Present only the information necessary for the intended audience
- Be concise. Consider putting the detailed raw summaries in the appendix
- Avoid decimals in the percentages
- Calculate valid percentages: use question completers as denominator
- Consider visuals: graphs/charts (ink-to-information ratio)
- Using lists/tables to organize themes

Reporting Elements

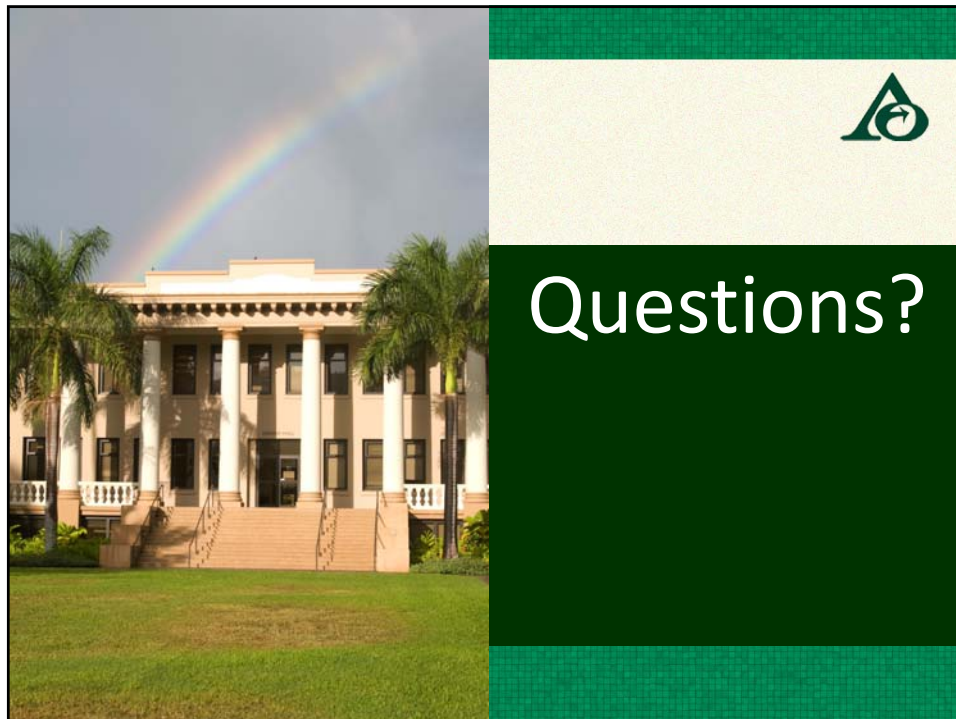
- Target SLOs
- Sampling number, technique, time frame
- Evaluation process
- Summarization of results
- Intended use of results

Sample Reports

Eight faculty members scored 40 randomly selected student research papers from fall 2013 senior writing courses to evaluate student achievement on the written communication outcome. 80% of the papers met or exceeded expectations. We met the achievement benchmark of 75%. The faculty celebrated the success and published the achievement on the website. Faculty also scheduled meeting to discuss improving writing assignment to strengthen our success.

Sample Data Report – Multiple Years

The curriculum committee scored between 30 to 50 student randomly selected papers each year from 2011 to 2013 to evaluate achievement on the written communication outcome. At least 80% of the students met or exceeded the outcome each year, exceeding the benchmark of 75%. There is a 6% increase from 80% in 2011 to 85% in 2013. The program has been making small but steady improvements over the three-year period. The faculty used the results in the following ways...



Data Analysis, Presentation, and Reporting

Group Discussion Task A: Compare the processed summaries. (1) Identify the differences between the processed summaries and the raw summary. (2) For each processed summary, name an audience and purpose that is appropriate for that summary. (3) Which summary would you use for your program? Why?

Raw summary

| Outcomes | Below Expectation | Approaching Expectation | Met Expectation | Exceeded Expectation |
|--------------------------------|-------------------|-------------------------|-----------------|----------------------|
| 1. Appropriate use of sources | 20 | 10 | 50 | 20 |
| 2. Well synthesized literature | 10 | 20 | 60 | 10 |
| 3. Sound methodologies | 15 | 5 | 55 | 25 |
| 4. Appropriate analysis | 5 | 15 | 65 | 15 |
| 5. Correct interpretation | 5 | 5 | 50 | 40 |

Processed summary 1: With details and consistent benchmarks across outcomes

| Outcomes | Below Expectation | Approaching Expectation | Met Expectation | Exceeded Expectation | Total % Met/Exceeded Expectations |
|-------------------------------------|-------------------|-------------------------|-----------------|----------------------|-----------------------------------|
| Correct interpretation (SLO 5) | 5% | 5% | 50% | 40% | 90% |
| Sound methodologies (SLO 3) | 15% | 5% | 55% | 25% | 80% |
| Appropriate analysis (SLO 4) | 5% | 15% | 65% | 15% | 80% |
| Appropriate use of sources (SLO 1) | 20% | 10% | 50% | 20% | 70% |
| Well synthesized literature (SLO 2) | 10% | 20% | 60% | 10% | 70% |

N=100 students. Benchmark: 80% of the students "Met" or "Exceeded" expectations.

Processed summary 2: Concise with consistent benchmarks across outcomes

| Outcomes | Total % Met/Exceeded Expectations | Benchmark met? |
|-------------------------------------|-----------------------------------|----------------|
| Correct interpretation (SLO 5) | 90% | Yes |
| Sound methodologies (SLO 3) | 80% | Yes |
| Appropriate analysis (SLO 4) | 80% | Yes |
| Appropriate use of sources (SLO 1) | 70% | No |
| Well synthesized literature (SLO 2) | 70% | No |

N=100 students. Benchmark: 80% of the students "Met" or "Exceeded" expectations.

Processed summary 3: Concise with inconsistent benchmarks across outcomes

| Outcomes | Total % Met/Exceeded Expectations | Benchmark | Difference |
|-------------------------------------|-----------------------------------|-----------|------------|
| Correct interpretation (SLO 5) | 90% | 80% | + 10% |
| Sound methodologies (SLO 3) | 80% | 80% | 0% |
| Appropriate analysis (SLO 4) | 80% | 80% | 0% |
| Well synthesized literature (SLO 2) | 70% | 80% | - 10% |
| Appropriate use of sources (SLO 1) | 70% | 90% | - 20% |

N=100 students.

Group Discussion Task B: Compare the processed summaries. (1) Identify the differences between the processed summaries and the raw summary. (2) For each processed summary, name an audience and purpose that is appropriate for that summary. (3) Which summary would you use for your program? Why?

Raw Summary

| Through the workshop, I learned how to | Strongly disagree | Somewhat disagree | Somewhat agree | Strongly agree |
|--|-------------------|-------------------|----------------|----------------|
| 1. Use guiding questions in data analysis | 20 | 10 | 50 | 20 |
| 2. Use descriptive statistics in data summarization | 10 | 20 | 60 | 10 |
| 3. Choose a data presentation table appropriate for audience | 15 | 5 | 55 | 25 |
| 4. Summarize achievement from a single source of data | 5 | 15 | 65 | 15 |
| 5. Summarize achievement from multiple sources of data | 5 | 5 | 50 | 40 |

Processed Summary 1

| Through the workshop, I learned how to | Number of Respondents | Strongly disagree | Somewhat disagree | Somewhat agree | Strongly agree | Total % agreement |
|--|-----------------------|-------------------|-------------------|----------------|----------------|-------------------|
| Summarize achievement from multiple sources of data (I5) | 100 | 5% | 5% | 50% | 40% | 90% |
| Choose a data presentation table appropriate for audience (I3) | 100 | 15% | 5% | 55% | 25% | 80% |
| Summarize achievement from a single source of data (I4) | 100 | 5% | 15% | 65% | 15% | 80% |
| Use descriptive statistics in data summarization (I2) | 105 | 10% | 19% | 57% | 10% | 67% |
| Use guiding questions in data analysis (I1) | 110 | 18% | 9% | 45% | 18% | 64% |

Processed Summary 2

| Techniques Participants Learned | Number of respondents | Total % agreement | Benchmark met? |
|--|-----------------------|-------------------|----------------|
| Summarize achievement from multiple sources of data (I5) | 100 | 90% | Yes |
| Choose data presentation table appropriate for audience (I3) | 100 | 80% | Yes |
| Summarize achievement from a single source of data (I4) | 100 | 80% | Yes |
| Use descriptive statistics in data summarization (I2) | 105 | 67% | No |
| Use guiding questions in data analysis (I1) | 110 | 64% | No |

Benchmark: 80% of the participants learned each technique.

Processed Summary 3

| Number of Techniques Learned | % of Participants |
|------------------------------|-------------------|
| 3 or more | 40% |
| 2 | 50% |
| 1 | 10% |
| Total | 100% |

Notes:

- (1) Percent of participants is calculated based on 100 participants who answered every question.
- (2) Benchmark is that 80% of the participants learned at least 2 techniques.

Group Discussion Task C: Compare the processed summaries. (1) Identify the differences between the processed summaries and the raw summary. (2) For each processed summary, name an audience and purpose that is appropriate for that summary. (3) Which summary would you use for your program? Why?

Raw Summary

| SLOs | Evidence 1: Essay | | Evidence 2: Presentation | | Evidence 3: Test scores | | Average % met expectations |
|-------|----------------------|-------|-----------------------------|-------|----------------------------|-------|-------------------------------|
| | Total # | % Met | Total # | % Met | Total # | % Met | |
| SLO 1 | 50 | 64% | 30 | 33% | 100 | 60% | 52% |
| SLO 2 | 50 | 80% | | | 100 | 75% | 78% |
| SLO 3 | 45 | 69% | 30 | 40% | 100 | 72% | 60% |
| SLO 4 | 50 | 76% | 30 | 53% | 100 | 80% | 70% |

Processed Summary 1

| SLOs | Evidence 1: Essay n = 45 to 50 | Evidence 2: Presentation n = 30 | Evidence 3: Test Scores n = 100 | Average % met expectations* |
|-------|--------------------------------------|---------------------------------------|---------------------------------------|--------------------------------|
| SLO 2 | 80% | Not applicable | 75% | 78% |
| SLO 4 | 76% | 53% | 80% | 70% |
| SLO 3 | 69% | 40% | 72% | 60% |
| SLO 1 | 64% | 33% | 60% | 52% |

* The average % met expectations is an unweighted average.

Processed Summary 2

| SLOs | Average % met expectations | Benchmark | Benchmark met? |
|-------|----------------------------|-----------|----------------|
| SLO 2 | 78% | 75% | Yes |
| SLO 4 | 70% | 70% | Yes |
| SLO 3 | 60% | 60% | Yes |
| SLO 1 | 52% | 60% | No |

Resource list for thematic analysis:

Analysis of Open-Ended Survey Responses – Where to start? Assessment Office workshop PowerPoint available online at http://manoa.hawaii.edu/assessment/workshops/pdf/analyzing_openended_survey_responses_2012-09.pdf

Aronson, J. (1994). A pragmatic view of thematic analysis. *Qualitative Report*, 2(1). From www.nova.edu/ssss/QR/BackIssues/QR2-1/aronson.html

Krueger, R. A. (1998). *Analyzing and reporting focus group results* (Focus Group Kit, Vol. 6). Thousand Oaks, CA: Sage.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd Ed.). Thousand Oaks, CA: Sage.

Silverman, D. J. (2001). *Interpreting qualitative data: Methods for analyzing talk, text and interaction*. Thousand Oaks, CA: Sage.