Data Collection

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Assessment Retreat

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Overview of Assessment Process

1. Select or develop measurable student learning outcomes
2. Identify classes, instructional strategies, assignments, and activities to foster outcomes
3. Select or develop measures that are able to provide information about outcome achievement and progress
4. Measure student learning outcomes
5. Analyze assessment results
6. Make adjustments in curriculum and/or teaching and learning strategies to address weaknesses and strengths

Academic Assessment Process
Attention To the Data Collection Process

Will help provide the data necessary to:

1. Credibly determine achievement of outcomes
2. Accurately identify outcome weaknesses to be addressed in the Action Plans
Outcomes Drive the Process

Outcomes may specify the conditions under which the skills should be examined and the academic level of students.

- **Summative Assessment Data Collection Strategy**
  - Gather data at the highest level of where students are expected to perform the outcome

- **Formative Data Assessment Data Collection Strategy**
  - Gather data at multiple points along the curriculum
  - Use curriculum map to determine appropriate data collection locations
Determining Where to Gather Data

- Ensure that locations (courses and levels) and sampling procedures are appropriate and sufficient for formative and summative purposes.
- Select longitudinal or cross-sectional method for formative assessment
- Base on Outcome Statements
  - Statement that suggests multiple places in the curriculum are needed to collect data?
Effective Communication General Education Outcome:

*Students are able to communicate both orally and in writing to synthesize valid information and effectively present informed ideas.*

- General Education Outcomes are expected to be developed over a student’s entire undergraduate experience.
- This requires gathering data at multiple places in the curriculum, including in the discipline - formative data collection strategy
  - Can collect data from the same students at multiple points (longitudinal)
  - Can collect data from groups of students at different points in the curriculum (cross-sectional)
When Planning for Data Collection

Consistency in Conditions

- Are data collected in a manner that ensures the integrity of the results?
- Types of student work and academic levels align with outcome statements
- Assignments are given similar weight for a specific academic level
- If measuring at the summative level, assignments are equally complex and reflect appropriate cognitive levels
- Time allotted is equivalent across groups (in class or out of class)
- Biases are accounted for
  - i.e., multiple reviewers are involved in the evaluation
- Student motivation is considered
- Classes are sampled or selected or students are sampled
- If sampling is used, account for conditions which might affect performance (e.g., face-to-face, online, scheduled class time)
An Example

In “Critical Thinking” Program, one learning outcome pertains to communication skills. If multiple courses are used to gather either summative or formative data, the following guidelines should help gather meaningful student learning results:

- Students should have the same amount of time, in or out of class
- Assignments should be similar
- Assignments should be written at the same cognitive levels
- Approximately the same amount of weight should be given for each
- When student work is being evaluated, two scorers should read each paper after receiving training on rubric use
Additional Planning Factors to Consider

<table>
<thead>
<tr>
<th>Sampling</th>
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| • Is it reasonable to include the population?  
• How many students are needed for sufficient sample size? |

When choosing an appropriate sample size for measuring student learning (see handout) consider the following:

• Population size
• Margins of Error
• Confidence Levels
• Variability in the Outcome
Data Collection Example: Portfolio Assessment

• When and where will the student work be collected? Who will be responsible for ensuring the work is placed into the portfolio?

• Are there specific assignments that correspond to specific learning outcomes or will faculty develop their own (again corresponding to outcomes) for entry into the portfolio?
  • Consider developing a common rubric for outcomes

• After deciding upon what assignments will be included, and how the assignments will be evaluated (holistic or analytic rubrics)
  • Who will evaluate?
  • How many evaluators will review each portfolio?
Activity

• Review your 2011-2012 (or 2012-2013) data collection plan in terms of the “Planning” slides (slides 5 and 7)
• Also refer to your Curriculum Map
• Modify where needed
Determining a Sample Size Handout

- **Determine Goals**
  - The extent of which the outcome is performed by students
    - In General Education, the goal is to be able to indicate the level of which students, upon graduation, can perform the General Education Outcomes

- **Consider Margin of Error and Confidence Levels**
  - What is an acceptable margin of error?
    - Typically 3% or 5% is used
    - i.e., for a margin of error of 3%: If 70% of the sampled students are able to problem solve at level X, then between 67% and 73% of the population of students are able to problem solve at level X.

  - What is an acceptable **Confidence Level**?
    - Typically 90% or 95% is used
    - i.e., for a confidence level of 90%: If the student population was sampled 100 times in the same manner, 90% of the samples selected would be actually representative of the population and would fall within the margin of error, and 10% of the samples selected would not be representative of the population regardless of the margin of error.

- **Estimate the Variability in the Outcome**
  - How many students are estimated to be able to carry out the outcome?
    - i.e., assuming 40% of students are able to carry out the outcome and 60% are not, then the variability in the outcome is 40%. “If variability is too difficult to estimate, it is best to use the conservative figure of 50%.”

Adapted from:
Sample Size Calculation Examples

Sample Size Equation

\[ n = \frac{P(1 - P)}{A^2 + \frac{P(1 - P)}{N}} \]

Where:
- \( n \) = Sample size required
- \( N \) = Number in population
- \( P \) = Variability in outcome (expressed as a decimal, i.e. 0.5 is 50%)
- \( A \) = Margin of error (expressed as a decimal, i.e., 0.03 is 3% Margin of Error)
- \( Z \) = Confidence level (expressed as standard numbers: 1.96 for 95% confidence, 1.6449 for 90%, and 2.5758 for 99%)

Sample Size Chart (provides estimate)

<table>
<thead>
<tr>
<th>Population</th>
<th>50% Variability</th>
</tr>
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<tbody>
<tr>
<td>2000</td>
<td>714</td>
</tr>
<tr>
<td>3000</td>
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</tr>
<tr>
<td>250000</td>
<td>1064</td>
</tr>
</tbody>
</table>

Adapted from: