Design Data-driven Assignments for Clear, Transparent, and Efficient Teaching

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Design data-driven assignments for clear, transparent, and efficient teaching

Design assignments to collect structured responses

Working with students in hybrid, in-person, or online courses involves many data interactions. **Data-driven assignments** are structured to gather and evaluate student work at both macro and micro levels needed to evaluate learning and improve course materials.

This practice uses Google Forms and linked Sheets to create data-driven assignments and custom dashboards.

Example assignment

The example below—from one of my many data-driven assignments—asks students to analyze a simple dataset and contribute quantitative and qualitative responses about “arrest warrant” data:

**Stage 1: Use Google Form to collect answers**

1. What's the oldest defendant age you found?  
   Short answer text

2. What's the youngest age you found?  
   Short answer text

3. What do you conclude based on these ages?  
   Long answer text

**Stage 2: Look at summary for macro view**

8. What's the youngest age you found?  
   204 responses

9. What do you conclude based on these ages?  

**Stage 3: Look at Google Sheet for micro view to identify student and question challenges**

<table>
<thead>
<tr>
<th>Name</th>
<th>B</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith, J.</td>
<td>83</td>
<td>7</td>
<td>16</td>
<td>inconsistent data</td>
</tr>
<tr>
<td>Garcia, M.</td>
<td>101</td>
<td>2</td>
<td>1</td>
<td>There was an error</td>
</tr>
<tr>
<td>Wie, K.</td>
<td>101</td>
<td>2</td>
<td>1</td>
<td>There are people of all ages on this list</td>
</tr>
<tr>
<td>Washington, Q.</td>
<td>101</td>
<td>2</td>
<td>1</td>
<td>That the ages in the data are unreliable</td>
</tr>
<tr>
<td>Adam, A.</td>
<td>101</td>
<td>1</td>
<td>2</td>
<td>I believe either someone else was a minor</td>
</tr>
<tr>
<td>Kelby, J.</td>
<td>101</td>
<td>1</td>
<td>2</td>
<td>Something went wrong</td>
</tr>
<tr>
<td>Owen, O.</td>
<td>101</td>
<td>2</td>
<td>2</td>
<td>You're never too young or too old to learn</td>
</tr>
<tr>
<td>Sollis, S.</td>
<td>101</td>
<td>2</td>
<td>2</td>
<td>Not everything on this chart is true</td>
</tr>
</tbody>
</table>

These views indicate that most students answered as I intended, but there were individual variations worth exploring further. Variations can be automatically flagged with filters and color coding and viewed by student and/or question.

Efficiently identify responses needing attention

The quality and quantity of student work can be rapidly assessed. Acceptable student responses can be acknowledged with minimal effort, giving more time to identify and address outlier responses and common mistakes—for individual feedback and iterative course redesign.

Student benefits include:
- **Efficient turnaround**: Enables rapid, efficient comparison and summary of student responses to assignments.
- **Data transparency**: Student responses can be presented to classes in a granular fashion.
- **Process transparency**: Students can develop a data mindset and then practice similar processes themselves.

Use Google Forms, Sheet, and Related Tools

Google Forms are accessible but powerful. The integration of Sheets simplifies data collection, analysis, and visualization.

All members of the UNLV community can create, store, and share Form and Sheet data. Instructors with spreadsheet experience already have the basic skills needed.

Relevant training and resources are available to the UNLV Community at [https://gsuite.google.com/training/](https://gsuite.google.com/training/) and [https://www.it.unlv.edu/lynda](https://www.it.unlv.edu/lynda).

Generalize to classes using structured assignments

This approach is useful in any class with structured or semi-structured assignments. I developed it to encourage reflection and transparency in a research methods course, but I’ve also used it in a variety of courses.

Benefits for instructors include:
- **Span of control**: Instructors control and iteratively refine how data is gathered, analyzed and retained in more detail than with Learning Management Systems.
- **Generalizable skills**: Form and Spreadsheet skills can be applied across multiple contexts, professional and personal.

Note: If used for grading, student identity must be gathered and aligned with LMS gradebooks using standard techniques.