USING GOOGLE APPS FOR ASSESSMENT: INTUITIVE, EFFICIENT, AND FREE

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United States Naval Academy
Session Objective

Increase knowledge of the ways in which Google Apps can be adapted for the assessment of learning including data collection using scoring guides/rubrics, rubric norming, and sharing results.
Participant Outcomes

Participants will be able to:

1. Explain how Google Apps can facilitate the assessment of student learning

2. Give examples of ways in which Google Sheets and Forms can be used to facilitate rubric norming/calibration

3. Describe the possibilities and find resources on how to use Google Sheets and Forms to facilitate reliable and efficient data use
United States Naval Academy
(Background)

• Undergraduate college of the United States Navy and Marine Corps
• ~4500 midshipmen (students)
  • Hail from all 50 states and U.S. Territories
  • Degree completion required in 47-month time frame by Act of Congress
United States Naval Academy
(Academics)

- 5 Divisions, 20 Academic Departments, 25 majors
  - General education (core) of ~80 of ~140 total credits
  - Typically 18 credit hours a semester
  - Bachelor of Science Degrees (English to Engineering)
United States Naval Academy
(Personnel)

- **Faculty/Staff**
  - ~580 faculty members
    - approximately $\frac{1}{2}$ civilian and $\frac{1}{2}$ military officers
    - Typically one administrative/clerical staff member per department
United States Naval Academy

(Background, challenges, constraints, and resources)

- G Suite used across the USNA enterprise since 2012
  - available free through Google Play, Chrome store, and Google product website
  - applications include:

  - Electronic Mail
  - Calendar
  - Slides (presentations)
  - Hangouts
  - Docs
  - Sheets
  - Cloud-based Drive
  - Forms
Challenges in assessment of student learning for faculty/departments

- Requires faculty members to develop proficiencies outside their areas of expertise

- Assessment is an extension of teaching, but the criteria and documentation required in assessment processes is outside the comfort zones for many faculty

- Technology can be seen as threatening and/or as helpful for facilitating collection, analysis, and reporting.
How comfortable are your faculty with technology?

- [W]e still have some challenges of a technical, or technological, nature. Scoring of rubrics is done by hand on paper, and data entry into Excel is a somewhat laborious task.... Our bar graph below is courtesy of a faculty member’s spouse, which points to the lack of institutional support and resources for assessment (as well as to the generosity of professors and their families). (2012 Assessment Report)

- At the beginning of the spring semester, it was discovered that the majority of data collected online for both the major and the core courses had “disappeared.” The online rubric developed ... by IT was supposed to collect and maintain the data in a spreadsheet, but most of the collected data had not gone into the spreadsheet. The department was on the verge of abandoning major assessment for the Class of 2014 ... (2012 Assessment Report)
Simultaneous collection of data by 20+ instructors on Google Sheets

Faculty asked to score at least 5 students from a randomized list during a group session where rubric norming is embedded. Separate tabs for each faculty member. Data is easily aggregated for analysis when scoring is complete.
Forms are formatted to be viewed appropriately on an iPad or smartphone.

Forms can be set with the option to let participants receive copies of their responses when they submit.
This is a rubric was delivered via email with a link to access the rubric itself.

The first section is guidance for how to apply the rubric (specifically why it is different from grading).

The form has a timestamp and records the participant along with their responses.
Using Google Forms for Data Collection

Google forms has several question types for collecting qualitative and quantitative responses:

- Multiple Choice = Pie
- Drop Down Menu = Pie
- Checkbox = Horizontal Bar
- Linear Scale = Vertical Bar
- Multiple Choice Grid = Vertical Bar
Send Form Electronically

E-mail or post link in a web page or calendar meeting

Send form in email with option to embed
Results

Data tab contains basic analysis and visuals

Data can be downloaded into a variety of formats including Excel
Summary Page shows aggregated responses that can be cut and pasted directly into annual report.

Less time spent on data entry, centralized and timely collection, and by sharing the access to the form less time spent on preparing data and more time on discussing results.
Google Forms for Course Evaluation

Indirect assessment can be conducted by asking students to reflect on the degree to which each learning outcome in the course was achieved.

Student responses are collected quickly and anonymously.

SB251 Course Evaluation

Form Description

Date evaluation was administered

Month ▼ Day ▼ 2017 ▼

Section Number *

Instructor *

Indicate how well this course supported your progress toward achieving the learning outcomes described below. Through this course, students will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Very well supported</th>
<th>Well supported</th>
<th>Supported</th>
<th>Somewhat supported</th>
<th>Not supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify, describe, and differentiate among major taxonomic categories, including the three domains and the lineage of human beings.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Name, identify, and distinguish among the basic molecules that comprise cells</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Google Summary of Course Evaluation

Google Forms automatically generates summary of responses.

Further analysis of answers can be conducted by downloading the data as a spreadsheet.
Please explain or elaborate on your answer choices regarding learning outcomes support made above.

- Great class!
- Good foundation of these concepts
- Learning outcomes were supported
- This course covered the scope of information that was supposed to be covered and at times delved deeper into related material as well.
- The genetics section of the course, particularly Mendelian inheritance, was somewhat confusing and difficult to comprehend.

individual student free responses are displayed anonymously and can be transferred to another program for coding
USNA Faculty Senate Assessment Committee (FSAC) Outcomes

Through the work of FSAC, USNA faculty and staff will...

1. maintain a culture of assessment of student learning that supports the improvement of midshipman educational experiences within the core and majors at the course, departmental, divisional, and institutional levels

2. employ meaningful, manageable, and sustainable practices in assessment of student learning throughout the USNA community

3. articulate the elements of the assessment cycle and describe assessment of student learning within their respective programs/department and the core curriculum

4. create student learning outcomes at the course, program, and core levels

5. as a result of meeting outcomes 1 through 4, meet accreditation expectations for institutional, core, and programmatic assessment
The Faculty Senate Assessment Committee is charged by the Academic Dean & Provost with maintaining an assessment process that focuses on improvement of student educational experiences.

Twelve members from academic areas, professional (military) development, and athletics need to be able to:

- organize and share materials
- develop a shared understanding of our purpose
- coordinate feedback
- document activity

The answer for us was Google Drive and Sheets.
Drive for Sharing

Access can be provided to groups or individuals and can be managed by folder and by file.

Access and update materials synchronously -- can view each others contributions in real time.

Revisions history and notifications of changes in Sheets.
# Sheets for Rubric Norming

For each criterion, record the score that best describes the department’s, program’s or core courses’ overall current status.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cermak</td>
<td>Chemistry Core</td>
<td></td>
<td>Exemplary</td>
<td>Fully Met</td>
<td>Developing</td>
<td>Not Present</td>
<td>Highlight Cell Below/Click on Arrow in Right Corner/Choose from List</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Student Learning Outcomes**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Student Learning Outcomes (sometimes called objectives or goals):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Level of Thinking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Learning outcomes**

- Student Centered: Learning outcomes are student centered statements of what students will know or be able to do.
- Developing: Learning outcomes are not student centered instead indicating what the department or instructors will do.
- Fully Met: Learning outcomes primarily focus on what students will know or understand, but not how they will use that knowledge or understanding.
- Not Present: The number of outcomes is reasonable
- Developing: The outcomes either fail to cover essential

**DropDown Menu for Selection and Cells for Text/Comments**

**Tab for Each Reviewer**
Sheets for Rubric Norming

<table>
<thead>
<tr>
<th>Sample Course</th>
<th>Exemplary Count</th>
<th>Fully Met Count</th>
<th>Developing Count</th>
<th>Not Present Count</th>
<th>ONE</th>
<th>TWO</th>
<th>REVIEWER</th>
<th>THREE</th>
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</thead>
<tbody>
<tr>
<td>Student Centered</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>Full Met</td>
<td>Full Met</td>
<td>Full Met</td>
<td>Full Met</td>
</tr>
<tr>
<td>Level of Thinking</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>1</td>
<td>Full Met</td>
<td>Not Present</td>
<td>Full Met</td>
<td>Full Met</td>
</tr>
<tr>
<td>Curriculum Coverage</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>1</td>
<td>Full Met</td>
<td>Not Present</td>
<td>Full Met</td>
<td>Full Met</td>
</tr>
<tr>
<td>Student Learning Outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-going</td>
<td>0</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>Full Met</td>
<td>Full Met</td>
<td>Full Met</td>
<td>Full Met</td>
</tr>
<tr>
<td>Assessment Action</td>
<td>0</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>Exemplary</td>
<td>Full Met</td>
<td>Full Met</td>
<td>Exemplary</td>
</tr>
</tbody>
</table>

Focus is on the actions that students will take to demonstrate competency in the outcomes. Indicators are helpful ways to operationalize the outcomes.

Levels appear appropriate for a core courses and indicators help to clarify scaffolding taking place within the courses.

Actually, I don't know what is "appropriate". What do I judge? Is this according to Bloom's Taxonomy?

Again, what is the benchmark for "too many" or "too few"? Does this judgment require expertise in the subject matter?

My only concern is this: LOC #1 seems to contain a lot of material, completely. What about LOC #4? When you look at the timecycle matrix, the number of indicators of LOC #4 seems endless. It would be helpful (and understandable) to have a list of sub-outcomes considered a part of it.

Page 17. Are all aspects of LO 1 being addressed? Atomic/Molecular Theory, Kinetics, Thermodynamics?

2014-15: Examined LO 1 with re: to stochiometry. This was examined again in 2015-16 to determine if changes resulted in improvements/change.

I'm not quite sure the difference between exemplary and fully met. Certainly, it seems (and I change in chemistry textbooks and the homework system improved student performance on the relevant problems to stochiometry.)
The challenge
(for administration)

- Administration needs to show that assessment is an on-going process and that results are used to improve the educational experiences of students.
- Annually
  - 25 reports from majors and 5 from minors
  - 17 reports from departments that contribute to the core
  - 3 reports from divisions
  - ~1000 pages
- Need to aggregate basic information and show progress that can support the larger narrative of assessment.
Google Forms for Reporting in Aggregate

Assessment Status Table

- Report Type *
  - Core
  - Major
  - Other:

- Select Department Name *
  - Choose

- Assessment Report Submitted *
  - Yes
  - No

- Learning Outcomes Assessed *
  - Yes
  - No

- Learning outcome(s) assessed
  - Your answer

- DIRECT assessment of student learning included *
  - Yes
  - No

- Indicate types of DIRECT assessment conducted, if any.
  - Your answer

- Indicate types of INDIRECT assessment conducted, if any.
  - Your answer

- Future actions identified, as a result of the current assessment activities *
  - Yes
<table>
<thead>
<tr>
<th>Department</th>
<th>Type of Report</th>
<th>Assessment Report Submitted</th>
<th>Learning Outcomes Assessed</th>
<th>Learning outcome(s) assessed</th>
<th>DIRECT assessment of student learning included</th>
<th>Indicate types of DIRECT assessment conducted, if any.</th>
<th>Indicate types of INDIRECT assessment conducted, if any.</th>
<th>Future actions identified as a result of current assessment activities.</th>
<th>Assessment actions identified as a result of previous assessment activities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>1. Fundamental eng</td>
<td>Common exam items</td>
<td>Student survey</td>
<td>Yes</td>
<td>Rewrite and rescope is planned</td>
<td>Will consider introducing a different rubric</td>
</tr>
<tr>
<td>Core</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>1. Fundamental eng</td>
<td>Common exam (final)</td>
<td>Final exam</td>
<td>Yes</td>
<td>Reassess laboratory project</td>
<td>Adjust final exam to ensure consistency</td>
</tr>
<tr>
<td>Core</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>1. Fundamental eng</td>
<td>Final exam items</td>
<td>Rubrics for labs, exams, or homework</td>
<td>Yes</td>
<td>Include student evaluations and rubrics for course coordinators</td>
<td>Changes to assessment plan with focus groups and rubrics</td>
</tr>
<tr>
<td>Core</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>1. Fundamental eng</td>
<td>Rubrics</td>
<td>Focus Groups</td>
<td>Yes</td>
<td>Adjust rubric after discussion with department heads</td>
<td>Adjust focus groups as needed</td>
</tr>
<tr>
<td>Major</td>
<td>Economics</td>
<td>Yes</td>
<td>Yes</td>
<td>1) Apply economic theory</td>
<td>Common exam items (local and external)</td>
<td>Faculty conversations regarding economic theory</td>
<td>Yes</td>
<td>Brownbag based on assessment plan</td>
<td>LEGO mindstorms software will be updated after assessment</td>
</tr>
<tr>
<td>Major</td>
<td>English</td>
<td>Yes</td>
<td>Yes</td>
<td>1. Write thesis-driven</td>
<td>Rubrics</td>
<td>Focus groups.</td>
<td>Yes</td>
<td>Relationship to the assessment plan will be maintained</td>
<td>Identified student performance standards will be developed</td>
</tr>
<tr>
<td>Major</td>
<td>History</td>
<td>Yes</td>
<td>Yes</td>
<td>the chief recommend</td>
<td>Rubrics</td>
<td>Rubric?</td>
<td>Yes</td>
<td>The department committee will meet to discuss assessment plan</td>
<td>Other lab tests will be added to the assessment plan</td>
</tr>
<tr>
<td>Other</td>
<td>Languages and Cultures</td>
<td>Yes</td>
<td>Yes</td>
<td>For 2016 all lang</td>
<td>Samples of student oral skills scores</td>
<td>Faculty conversations regarding writing skills</td>
<td>Yes</td>
<td>More classes will be added to the assessment plan</td>
<td>A. Results of the student assessment will be analyzed</td>
</tr>
<tr>
<td>Core</td>
<td>Political Science</td>
<td>Yes</td>
<td>Yes</td>
<td>2. A political science</td>
<td>Sample of student work and rubric</td>
<td>Rubric and assignments</td>
<td>Survey of students</td>
<td>B. One or more brown bags will be used</td>
<td></td>
</tr>
<tr>
<td>Core</td>
<td>English</td>
<td>Yes</td>
<td>Yes</td>
<td>1) Writing Competent Speech</td>
<td>Instructor Essay Questions (unique Focus groups)</td>
<td>Survey of students</td>
<td>Yes</td>
<td>C. Rather than wait until the end of the semester, we will gather feedback</td>
<td></td>
</tr>
<tr>
<td>Core</td>
<td>History</td>
<td>Yes</td>
<td>Yes</td>
<td>A. Historical competency</td>
<td>Pre-test using multiple choice test</td>
<td>Survey of students</td>
<td>Yes</td>
<td>The department will use a different rubric for the survey</td>
<td></td>
</tr>
<tr>
<td>Core</td>
<td>Political Science</td>
<td>Yes</td>
<td>Yes</td>
<td>2. A political science</td>
<td>Exams and Written Assignments exit survey</td>
<td>Survey of students</td>
<td>Yes</td>
<td>Further analysis will take place</td>
<td></td>
</tr>
<tr>
<td>Major</td>
<td>Oceanography</td>
<td>Yes</td>
<td>Yes</td>
<td>SILO #3: Analyze the water</td>
<td>Exams and Written Assignments exit survey</td>
<td>Survey of students</td>
<td>Yes</td>
<td>Results will be disseminated to all relevant stakeholders</td>
<td></td>
</tr>
<tr>
<td>Major</td>
<td>General Science</td>
<td>Yes</td>
<td>Yes</td>
<td>1. Communicate clearly</td>
<td>Pre-test using multiple choice test</td>
<td>Survey of students</td>
<td>Yes</td>
<td>IC322's measurements of water quality will be updated</td>
<td></td>
</tr>
<tr>
<td>Major</td>
<td>Quantitative Economics</td>
<td>Yes</td>
<td>Yes</td>
<td>Speak, read, write, think</td>
<td>Exam questions, on-line quiz, exit survey and Midshipman A YES</td>
<td>Survey of students</td>
<td>Yes</td>
<td>Further analysis will take place</td>
<td></td>
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<tr>
<td>Major</td>
<td>Computer Science</td>
<td>Yes</td>
<td>Yes</td>
<td>An ability to apply</td>
<td>Exam questions, on-line quiz, exit survey and Midshipman A YES</td>
<td>Survey of students</td>
<td>Yes</td>
<td>Future analysis will take place</td>
<td></td>
</tr>
<tr>
<td>Major</td>
<td>Chemistry</td>
<td>Yes</td>
<td>Yes</td>
<td>#1: Explain natural</td>
<td>Final exam, quiz questions, indep</td>
<td>Survey of students</td>
<td>Yes</td>
<td>Faculty brownbags to be added to the assessment plan</td>
<td></td>
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<tr>
<td>Major</td>
<td>Cyber Science</td>
<td>Yes</td>
<td>Yes</td>
<td>a. An ability to apply</td>
<td>Graded student work projects, SOlF and Course Coordinator</td>
<td>Survey of students</td>
<td>Yes</td>
<td>Further refinement of the assessment plan will be made</td>
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<tr>
<td>Major</td>
<td>Physics</td>
<td>Yes</td>
<td>Yes</td>
<td>(1) Demonstrate del</td>
<td>Major Field Test, Project Rubric, Cl 1/C laboratory instructors com</td>
<td>Survey of students</td>
<td>Yes</td>
<td>Recommendations. Development of new assessment tools will take place</td>
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<tr>
<td>Core</td>
<td>Mathematics</td>
<td>Yes</td>
<td>Yes</td>
<td>“Formulation” and “A”</td>
<td>Capstone Papers and Rubrics</td>
<td>Survey of students</td>
<td>Yes</td>
<td>Pilot of atoms-first curve will be conducted</td>
<td></td>
</tr>
<tr>
<td>Core</td>
<td>Chemistry</td>
<td>Yes</td>
<td>Yes</td>
<td>Apply the language</td>
<td>Multiple-choice exam questions, E. none</td>
<td>Survey of students</td>
<td>Yes</td>
<td>Pilot of atoms-first curve will be conducted</td>
<td></td>
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<tr>
<td>Core</td>
<td>Chemistry</td>
<td>Yes</td>
<td>Yes</td>
<td>#1: Explain natural</td>
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<td>Survey of students</td>
<td>Yes</td>
<td>Pilot of atoms-first curve will be conducted</td>
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</table>
## Information by Department

<table>
<thead>
<tr>
<th>Type of Report</th>
<th>Department Information</th>
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<tbody>
<tr>
<td>Core</td>
<td>Aerospace Engineering</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Core</td>
<td>Electrical and Computer Engineering</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Core</td>
<td>Mechanical Engineering</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Core</td>
<td>Naval Architecture and Ocean Engineering</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Core</td>
<td>Weapons and Systems Engineering</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<td>Naval Architecture and Ocean Engineering</td>
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<tr>
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<td>Engineering Core</td>
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<td>100%</td>
<td>100%</td>
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<td>Engineering Majors</td>
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<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
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<tr>
<td>Engineering All</td>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
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No Actions Were Needed
<table>
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<tr>
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<th>B</th>
<th>C</th>
<th>D</th>
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<td></td>
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<td>Learning</td>
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Conclusion

• Greater ease of collection and analysis at the departmental level and aggregated up to the institutional level.
• Google Drive allows for sharing materials, increasing communication, and documenting activities.
• Forms and Sheets lets us collect, norm/calibrate, aggregate, and document easily.
• Can edit in real-time without issues with down-and uploading or multiple versions.
• **CAUTION** with PII/FERPA compliance if you’re not using an enterprise solution.
Other software tools for collaboration and data collection

• **Dropbox** ([www.dropbox.com](http://www.dropbox.com))
  - “Organization-wide collaboration: Use comments to quickly gather feedback right next to your files. You can also invite your team to shared folders, where they can add and edit files together. Changes sync automatically, giving everyone the most recent version in their Dropbox folders.”

• **Microsoft Office 365** ([www.microsoft.com](http://www.microsoft.com))
  - “Microsoft Office collaboration and productivity tools delivered through the cloud. Everyone can work together easily with anywhere access to email, web conferencing, documents, and calendars.”

• **JotForm** ([www.jotform.com](http://www.jotform.com))
  - Free
  - Wide variety of form templates available
Questions/Discussion

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