Pivot Table Basics for Assessment Professionals

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After this session, you will be able to:

- Understand IUPUI PUL Assessment project
- Set up pivot tables
- Alter pivot table data
- Sort pivot tables and filter using slicers
- Format pivot tables for effective presentations
- Create pivot charts
Principles of Undergraduate Learning (PULs)

“The Principles of Undergraduate Learning comprise a common, campus-wide articulation of expectations for baccalaureate degree recipients.”

- Developed during the 1990s;
- Approved by Faculty Council in 1998;
- Revised in 2005 and 2007; and
- Approved by Faculty Council in 2007.

The 6 PULs

- Core Communication & Quantitative Skills
- Critical Thinking
- Integration & Application of Knowledge
- Intellectual Depth, Breadth, & Adaptiveness
- Understanding Society & Culture
- Values & Ethics

http://academicaffairs.iupui.edu/plans/pul/
Core Communication & Quantitative Skills

The ability of students to express and interpret information, perform quantitative analysis, and use information resources and technology—the foundational skills necessary for all IUPUI students to succeed.

Core Communication & Quantitative Skills

- Core communication and quantitative skills are demonstrated by the students’ ability to:

  1. Express ideas and facts to others effectively in a variety of formats, particularly written, oral and visual formats;
  2. Comprehend, interpret, and analyze ideas and facts;
  3. Communicate effectively in a range of settings;
  4. Identify and propose solutions for problems using quantitative tools and reasoning;
  5. Make effective use of information resources and technology.
Core Communication & Quantitative Skills

- Because of the complexity of this PUL, it is divided into three domains for assessment:
  1. Written, Oral, and Visual Communication Skills;
  2. Quantitative Skills
  3. Information Resource Skills

Critical Thinking

The ability of students to engage in a process of disciplined thinking that informs beliefs and actions. A student who demonstrates critical thinking applies the process of disciplined thinking by remaining open-minded, reconsidering previous beliefs and actions, and adjusting his or her thinking, beliefs and actions based on new information.
Critical Thinking

... [critical thinking] is realized when the student demonstrates the ability to:

1. Apply
2. Analyze
3. Evaluate, and
4. Create knowledge, procedures, processes, or products to discern bias, challenge assumptions, identify consequences, arrive at reasoned conclusions, solve challenging and complex problems, and make informed decisions.

PULs and the Curriculum

All courses must identify a major-emphasis PUL (included in the course catalog).

Courses may also have moderate- and minor-emphasis PULs.

Example Introductory Statistics

- Major: Quantitative Skills
- Moderate: Critical Thinking
- Minor: Information Resource Skills
How the PULs are Assessed

- Indirect Assessment
  - students’ self-reports of their abilities

- Direct Assessment
  - faculty ratings of students’ abilities

Indirect Assessment

- Continuing Student Survey
  - Administered to a stratified random sample of undergraduates 2 out of every 3 years.
  - Students self-report how effective they are vis-à-vis 33 skills/abilities.
  - Provide reports for campus and schools on seniors’ self reports on the PULs.
  - The ratings represent abilities for majors.
Faculty Concerns about Direct Assessment

- Assessing the PULs is a time-consuming process.
- The results of the PUL assessments will be used to evaluate faculty members.
  - If faculty rate student performance less than “Effective” or “Very Effective” it will be taken as evidence of poor teaching.
- [Gary’s Concern] The evaluation of PULs is not based on random sampling.

Addressing Faculty Concerns

- It’s a time consuming process:
  - Provided workshops on selecting assignments and using rubrics to assess student performance.
  - Conducted a series of pilot assessments with large courses and asked those faculty members to speak to the issue of time.
Addressing Faculty Concerns

- PUL results will be used to evaluate faculty:
  - At the institution level, results are reported in aggregate for 400-level courses (summative evaluation).
  - At the school level, results are reported in aggregate for 100-, 200-, 300-, and 400-level courses (formative evaluation).
  - Additional school-level reports will be provided if requested by the faculty.

Addressing Gary’s Concern

- Because sampling of courses is not random, tracking trends can be very misleading.
- Report results on a cumulative basis.
Why are we here?

- The faculty assessment committee in Engineering & Technology asked for department-/program-level reports by course.
- That report was more than 200 pages long!
- My solution: I told them a story.
- That story involved drilling down into the data.

What is a pivot table?

- Arrange data to fit your needs
- Emphasize specific aspects of data
- Easy and fun way to present data
Part 2: Creating A Pivot Table

Creating a pivot table

Formatting Data

Data List

Excel Table

Format headers
Blank cells
Auto format
Easy summaries
Creating a pivot table

Click inset, pivot table

Where do you want it?

What is your data source?

That’s it!

Creating a pivot table

- Four main areas
- Different views
- Open/close

Pivot table field list

Power is in being able to rearrange data

Defer layout

- Checkbox
Cut and Paste Pivot Tables: As Data

Options: Actions: Select

“Entire pivot table”

Cut as normal

Paste Values

Cut and Paste to Create New Pivot Tables

Go to select: entire pivot table

Hit ctrl+c

Select new worksheet

Hit ctrl+v

Both pivot tables work independently
Be aware that pivot table data can be changed

- **Dynamic**
  - Can change data set and refresh

- **Static**
  - Will want to lock sheet
  - Review: protect sheet

Find cells that led to data

Double click cell

table of data that led to that cell (can only do one cell at a time)
Exercise 1

Create a pivot table using the data in the data list you were provided. Paste the pivot table in a new spreadsheet, and set it up so that PUL name is in the rows and the Rating label is in the columns. Place the ratings in the data. Then paste the table as data in a third spreadsheet and protect the original data sheet.

Part 3: Altering and Sorting data in a Pivot Table
Sorting Data

Can sort fields just like regular excel sheet

Create Custom Sort

File: options: advanced: general

"Edit custom lists" button on right

Enter new list

Sort by new list
Sorting by Custom Sort

Sort:
Ascending (select column):
More options:
Unclick “Sort automatically” and select your list

Filtering Data
Multiple Ways to Do It

Like a table
• Click arrow, select items to filter at bottom

By values
• Value filters: select option: type in what you want to keep

By labels
• Label filters: select option: type in what you want to keep

By drag and drop
• Drag from field list and drop in filter
• No data in A1 or A2!
Slicers

- Way to visually represent filters
- Can select easily using CTRL and Shift options
- Add multiple slicers for more fine-grained filtering
- Easy to format
  - Pre-made styles or, create your own style

Grouping

- Group multiple items together
  - Select items
  - Clink “Group selection”
- Sort groups and sort within groups
- Ungroup
Exercise 2

- The Dean of Environmental Management wants to find the number of Core Communication and Quantitative Skills ratings by classes at the 400 level. Sort your pivot table by Grand total number of ratings. Filter out all those that are not Core Communication and Quantitative Skills. Then create a slicer for course level and format it to your school’s color scheme. You may also choose to group them together.

Part 4: Summarizing
Summarizing data

Displaying subtotals (Design tab)

- Default = top
- Bottom
- Hide

Grand totals

- Off for columns/rows

Different Values Multiple Ways

Options tab

- Summarize values by...
- Show Values as...

Directly within values

- Click value
- Summarize values by...

Change number format

- Just as in Excel
Exercise 3

The director of first-year programs wants to know what percent of students in 100-level classes were very effective in core communication skills. Change the value field settings and filter the data so this data can be highlighted (you don’t need to display subtotals).
Part 5: Formatting

Basic Formatting

Stacking/Collapsing data fields
- Use Plus/minus arrows

Field Headers
- Eliminate Field headers (Design tab)
- Type new names in headers
Formatting

Format just as would format traditional Excel tables.

Design: Pivot table styles for options

Styles are fungible

- Need to click “Banded rows” and/or “Banded Columns” in order to apply these

Formatting

Blank rows

- Adds clarity
- May make report longer

Report layout

- Outline form
- Tabular form
Themes

Built into Office themes

Go to page layout: Themes

If you have a style, the theme will change

Themes

You can create your own theme

• Design: New pivot table style
• Update fill, text styles just as normal Excel spreadsheet
• Be aware of banded rows/columns changes
**Formatting**

- **Highlighting stays with pivot table cells**
  - Adding layers will not move highlighting to a different cell

- **Same for conditional formatting**
  - Changes in format will also move with the pivot table.

**Exercise 4**

- Create a theme for the table consistent with your institution's colors. Then apply a highlight to Intellectual Depth, Breadth, and Adaptiveness and find out which School had the highest percentage of Very Effective ratings.
Part 5: Pivot Charts

Pivot Charts

- Same mechanisms, but applied to charting procedures
- Pivot tables: Pivot chart (Same as pivot tables)
- Can also create pivot chart directly from pivot table (insert: pick chart)
Pivot Charts

**Pivot table working alongside pivot chart**
- Work in conjunction
- Changes to pivot table mirror changes to pivot chart

**Move chart to it’s own sheet**
- Design: Move chart location
- Still linked to original pivot table

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**Pivot Charts**

- Design: chart styles
  - Layout tab
  - Format : Current selection
  - Right click element
Exercise 5

A faculty member who is very interested in critical thinking is looking for data for a presentation. Create a pivot chart displaying the data for Critical Thinking by course level. Then move it to its own sheet and format it how you would like.