

Findings from the DIL Interviews: Data Visualization and Representation

Skills in this competency may include:

- Proficiently uses basic visualization tools of discipline.
- Avoids misleading or ambiguous representations when presenting data in tables, charts, diagrams, etc.
- Chooses the appropriate type of visualization, such as maps, graphs, animations, or videos, based on their understanding of the reason / purpose for visualizing or displaying data.

Additional skills mentioned by an interviewee:

- The mechanics of specific data visualization software programs.

Average Ranking of Importance (5=essential): Faculty=4.63, Students = 4.35

Faculty responses:

Faculty saw this as a critical competency for students to master. In considering this competency, faculty identified a need for more advanced instruction for students to maximize the effectiveness of their representations. Several of the faculty reported that students were able to learn the mechanical aspects of using visualization tools, but were not as skilled in the conceptual aspects of what makes a good visualization. As one faculty member stated “visualization is communication”. Students also struggle in making use of representations to evaluate the quality of their data or to “impact a specific decision.”

Faculty reported that students received little to no formal training in this area as graduate students. Instead students were using the skills they acquired from undergraduate coursework along with their intuition in creating visualizations and representations of their data. There were some exceptions:

- One faculty member recommended a book on the topic to incoming students.
- Another faculty member reported that advanced techniques were taught in the lab.

Student responses:

Student responses indicate recognition of the importance of data visualization for convey their findings in publications and other venues. The need to connect their work to their intended audiences was mentioned by several students. One student also mentioned that “it’s pretty much impossible to interpret the data without turning it into something.”

Students reported informal training on data visualization – advisors, lab mates/peers, and online help were listed as resources for learning about the topic. Students mentioned a desire for software-specific instruction in creating their data visualizations. Visualization software mentioned includes: R, MATLAB, Python, GMT, ArcGIS, Excel, SPSS, GIMP, and SigmaPlot.



Jake Carlson – PI (Purdue), Camille Andrews (Cornell), Marianne Bracke (Purdue), Michael Fosmire (Purdue), Jon Jeffryes (Univ. of MN), Lisa Johnston (Univ. of MN), Megan Sapp Nelson (Purdue), Dean Walton, (Univ. of OR), Brian Westra (Univ. of OR), Sara Wright (Cornell)