



Game Time: Evaluating Data Visualizations for Ethicality and Effectiveness

Megan Pietruszewski Norman
Pennsylvania State University

Abstract

Data visualizations are found across social media, news, advertisements, and many other spaces. Learning how to evaluate and construct effective and ethical data visualizations is an important skill for communication professionals. This activity provides an opportunity for students to practice these skills through a game. After doing background reading on data visualizations before class, students are shown a series of ineffective data visualizations and asked to individually evaluate how they could be improved. Next, students discuss their observations in groups and arrive at a team answer. Finally, groups share their answer with the entire class. Students can learn from each other through these discussions, and the instructor receives real-time feedback on the class's understanding of data visualizations. Students can use these evaluation skills to design their own effective data visualizations in future assignments.

Data skills are important for many careers. A 2022 study by Forrester Consulting, commissioned by Tableau, found that 87% of employers believe basic data skills are important or very important for daily workflows. Tableau differentiates data literacy skills into “technical skills” and “non-technical skills” (Salesforce, 2024), the latter of which includes communication and research skills that are often at the center of courses in media and communications programs. One crucial technical data skill is visualization.

Because data visualizations are frequently found in news articles and other information sources like reports and advertisements, future journalists, public relations practitioners, advertisers, and savvy media consumers need to understand how to evaluate and create ethical visualizations of data, both for their job performance and day-to-day media literacy. Instructors can help build experiences in all types of courses

to help foster students' data literacy skills. I outline how, through a simple classroom game, students can evaluate data visualizations and consider the ways they may be misleading or ineffective. This activity can be scaled in difficulty depending on students' skill levels, upcoming assignments, and course learning goals.

Lesson Plan Overview

The goal of this activity is for students to evaluate data visualizations for misleading or ineffective strategies through a game. This activity will work best if students come to class with some background on visualizing data, perhaps through an assigned reading. A useful resource for students in preparing for class may be Mulvaney *et al.*'s (2022) open-access textbook, *Critical Data Literacy*. The instructor can refresh on some basics of effective data visualization at

the beginning of class (e.g., avoiding axes that distort data relationships).

Students can be evaluated on elements of effective data visualization most relevant to the course. For example, a rubric for effective data visualization might include a spectrum of poor to excellent ratings regarding how comprehensible the infographic is at quick glance, the accessibility of design and colors, the fit of the visualization form to the data relationship (e.g., line graph displaying trends over time), clarity of title and axes labels, integrity of the visualization (no purposeful or accidental distortion), and use of reliable sources (Mulvaney *et al.*, 2022; Pandey *et al.*, 2015).

Students will practice and apply these skills to a game. A game may help students get more engaged with the material than a lecture alone. The instructor should arrive with several examples of misleading or ineffective data visualizations in a slide presentation. These could be real-world examples, past student examples, or made up by the instructor. There are plentiful collections of misleading, real-world data visualizations (e.g., Ellyatt, 2022). Before arriving to class, the instructor should also consider how they want to set up student participation, either through an online system, like Tophat, or a pen-and-paper approach.

The game is simple. Students should form small teams of three to four members. Next, the instructor should show a data visualization for 15–20 seconds and ask students to evaluate it *individually*. Students can write down observations or submit their ideas through Tophat or another online program. Next, students should share their observations with their teammates and form a final answer (offer another 30 seconds for team deliberation). Teams should again write down or submit their final team answer. Lastly, the instructor can reveal the final answer and share ideas on how to improve the data visualization. This process can be repeated for five to six data visualizations, as class time permits. The team with the most points wins.

Leaving time for students to first evaluate the data visualization individually can ensure that every student participates and helps set up effective and efficient team discussions. This is the opposite approach to the “I do – we do – you do” teaching strategy (for an overview, see Reha, 2019), as this activity assumes students have some background knowledge of effective data visualization and are prepared for activities at higher levels of Bloom's Taxonomy by analyzing and

evaluating examples. This format also allows students to discuss with their peers and learn from one another. The game also allows instructors to get real-time feedback on areas where the class, as a whole, might be struggling or succeeding by hearing the teams' answers.

The next activity or homework assignment can allow students to move from evaluating to creating data visualizations (scaling up Bloom's Taxonomy). Students could use primary data to construct new data visualizations by considering important patterns and points to highlight, and avoiding common issues they identified in the game. Alternatively, if a class learning goal is not to construct data visualizations or analyze data directly, students can look for examples of data visualizations they encounter in their media environment (e.g., on social media, on campus, etc.) and evaluate them for effectiveness to foster media literacy skills.

In summary, this game is suitable for classes where students create their own data visualizations, like a research methods course, but can also be used in any class where students are honing media literacy skills since data visualizations are commonly used in news and other media.

References

- Ellyatt, T. (2022). Poor data visualisations, Real life examples out there in the wild. *Medium*. <https://medium.com/@thomas.ellyatt/bad-data-visualization-real-life-examples-out-there-in-the-wild-eb5032329aeb>
- Forrester Consulting. (2022). *Building data literacy: The key to better decisions, greater productivity, and data-driven organizations* (pp. 1–24). https://www.tableau.com/sites/default/files/2022-03/Forrester_Building_Data_Literacy_Tableau_Mar2022.pdf
- Mulvaney, N., Wubbenhorst, A., & Kaur, A. (2022). *Critical data literacy*. Toronto Metropolitan University PressBooks. <https://pressbooks.library.torontomu.ca/criticaldataliteracy/>
- Pandey, A. V., Rall, K., Satterthwaite, M. L., Nov, O., & Bertini, E. (2015). How deceptive are deceptive visualizations? An empirical analysis of common distortion techniques. *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 1469–1478. <https://doi.org/10.1145/2702123.2702608>

Keywords: Data Visualization, Games, Media Literacy, Team Activity

Reha, M. K. (2019). How to use “I Do – We Do – You Do” in teaching. *Grand Canyon University*. <https://www.gcu.edu/blog/engineering-technology/how-use-i-do-we-do-you-do-teaching>

Salesforce. (2024). Data literacy explained: Definition, importance, examples, and more. *Tableau from Salesforce*. <https://www.tableau.com/data-insights/data-literacy/what-is#how>

Megan Pietruszewski Norman has a Ph.D. in Mass Communications from Pennsylvania State University, where her research focused on strategic communication of health and environmental risks. She works as a Senior Research Manager at Big Valley Marketing.

© Megan Pietruszewski Norman, 2025. Licensed under a Creative Commons Attribution-Non Commercial-ShareAlike 3.0 Unported License.