DSGN 426: Whole-Brain Communication

Data Storytelling through Decks & Dashboards
(Exclusively) MMM 2020 Fall A, first 5 weeks

Instructor: Steven Franconeri, Professor of Psychology; Kellogg + Design, by Courtesy
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Office Hours: By appointment.

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Course Objective

Present your ideas and solutions – and the data that motivates them – in a manner that is engaging, clear, and memorable. Presentations and explanations typically overwhelm an audience's limited capacity for new information, by directing it to a limited part of the brain. Learn to communicate to the whole brain, by turning verbal messages to salient visuals, expressing abstract numbers as sensorimotor objects, leveraging existing association networks, and telling immersive stories. Learn to perform data analytics with the power of your visual system (including a primer on Tableau), and how to show the patterns that you discover to others. Techniques will be grounded in cognitive science – why our brains are limited in perceiving, learning, and storing information – as well as research in data visualization, and principles of graphic design. Course grading will be based on projects, quizzes on readings, class attendance & participation, and peer critiques.

Prerequisites: **Negative prerequisite** with KACI 925, students cannot enroll in both courses.

Required knowledge: Basic data manipulation in MS Excel. You will be strongly encouraged to learn advanced visualization software (Tableau), but all assignments can be completed with a combination of Excel and PowerPoint.

Required Text

Cole Nussbaumer Knaflic. *Storytelling with Data*, Wiley Press, 2015
Additional readings will be posted to Canvas as web URLs or PDFs

For Kellogg students, the book *may* be accessible for free through the Northwestern library (depends on current subscriptions). Try this link:
https://www.oreilly.com/library/view/storytelling-with-data/9781119002253/?ar
Enter your Northwestern ".edu" email to get access to safari books online.
You will get an activation email that you have to click on.
Questions? Please contact the TA.

Course Activities + Grading

Pre-work before the course

Assignment	Grade	Est. Time	
Pre-reading		2 hours	Pre-read the articles & videos at the footer of this page (PDFs and links available on Canvas). There may be a (fairly easy) pop quiz on these materials in Session 1.
Excel pre-tutorial		Variable	If you are unfamiliar with basic data manipulation in Excel, please complete the self-contained tutorial on the 'Files' section of Canvas.
Poll Participation		5 min	You will receive an email link to a pre-course survey form.
Submit 2 work examples for in-class redesign Due Sept 30, 5pm Chicago on Canvas		2 hours	See the Prework assignment on Canvas. While this example is not due until a few days after class starts, please start thinking and researching now. You will submit **one short slide sequence**, and **one data dashboard** view. Alternatives will be available for students who cannot rely on work examples

Pre-reads (or pre-watches/listens):

https://www.cbc.ca/radio/undertheinfluence/the-best-elevator-pitch-in-history-1.4721353
http://www.ted.com/talks/nancy_duarte_the_secret_structure_of_great_talks

https://eagereyes.org/basics/spreadsheet-thinking-vs-database-thinking
Very optional, only if you are truly excited about data formats:
http://vita.had.co.nz/papers/tidy-data.pdf
https://vimeo.com/33727555

https://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_see
n https://hbr.org/2016/06/visualizations-that-really-work
https://queue.acm.org/detail.cfm?id=1805128
http://paldhous.github.io/NICAR/2016/infodesign.html

Highly recommended text (optional)
Speaking PowerPoint: The new language of business, Bruce Gabrielle
https://www.amazon.com/Speaking-PowerPoint-New-Language-Business/dp/098423604X

During the course

Assignment	Grade	Est. Time	
Slide sequence and dashboard tab revision **(Individual)** Due Oct 14 5pm Chicago via Canvas	20%	6 hours	Create a before-and-after contrast of your submitted 'work examples' (see Pre-work), for both a short slide sequence and a simulated dashboard tab. Alternative cases will be available for students who cannot rely on work examples
Critique slide. sequence and dashboard tab **(Individual)** Due Oct 21 5pm Chicago via Canvas	20 %	2 hours	Critique the 'after' examples from your peers, based on the submissions above.
Offline videos & reading	N/A	5-8 hours	Watch offline video content and complete a set of quiz questions and micro-assignments (e.g., sketch a graph). Finish reading the Nussbaumer text before the third session
Class Participation	20%	N/A	Students are expected to have read preparation materials, be in class on-time, complete offline video requirements, and to contribute to class discussions.

Post-work after the course

Assignment	Grade	Est. Time	
Presentation assignment (**Group** Assignment) Due Nov 13, 5pm Chicago via Canvas	20%	5 hours	Based on a provided case and dataset, record narration in a 5-minute PowerPoint presentation that makes a data-based argument, with visualizations. Details on Canvas.
Critique presentation files **(Individual)** Due Nov 20, 5pm Chicago via webform	20%	2 hours	Watch presentation files from your peers, offering constructive critiques via a web-based form.
Poll Participation **(Individual)** Due Nov 20, 5pm Chicago via webform	Counts toward participation	15 min	You will receive an email link to a post-course survey form, a request to confidentially rate the relative contribution of your group members, and to rate your most thoughtful critiquer(s). On-time submission counts toward participation grade.

Outline of Sessions

Offline Videos
Data visualization for analytics and storytelling
The common DNA behind the visual variables that tie together all
visualizations. Cutting-edge visualization techniques.
How to tell stories with your data
Tutorial on Tableau: Learn state-of-the-art visualization software

Sessions 1-2
Course Overview, Essentials of Graphic Design, Be Understood.
The neuroscience of the path from understanding to memory. Why explanations fail.
Live experiment and data analysis on your memory for arguments.

Session 3-4
Be engaging and sticky, Be repeatable and viral:
 The power of pictures, visualizations, metaphors and concrete explanations.
Data Visualization group challenge exercises
Small group redesign of work examples (slides, visualizations, and dashboards)

Session 5
Pitch challenge
Data Visualization challenge
Highlights of redesigns
Q&A / Review
Course evaluations

Assignments: See the 'Assignments' section of Canvas for full descriptions and requirements. Grading will be on a 1-10 scale. A '9' is already an 'A' grade – '10' grades reflecting an A+ will be rare and require an outstanding effort. All assignments must be handed in on Canvas in the indicated format (PDF, PPTX, Google form, etc), no physical papers will be accepted. A subset of completed assignments will be shown live in class, and you may be asked to discuss yours in class. Late assignments will be subject to grading penalties, and may not be accepted. At the end of the course, you will receive a link to a post- course survey form, and a request to confidentially rate the relative contribution of your group members for group assignments, as well as your peer critiquers.

Electronics: All devices must be used strictly for course note-taking (e.g., Word, Canvas, PowerPoint, Tableau, Excel, *not* email, etc). Please be present, even on a Zoom call.

Software*: Tableau is specialized software for data visualization, for both PC and Mac.
https://www.tableau.com/academic/students
If this link does not work, the TA can provide you with an activation key.

There is a series of video tutorials on their website (you'll need to sign up for a free account), at
https://www.tableau.com/learn/training
This book contains a more thorough tutorial:
Murray, D. *Tableau Your Data!: Fast and Easy Visual Analysis with Tableau Software.* Wiley, 2013

Honor Code
The Kellogg Honor code applies to this course, including:
• You are expected to be prepared for and to be on time.
• You are expected to participate actively in class discussions.
• Class discussion stays in class.

Recordings, Postings, Social Media, etc: No audio or visual recordings can be made of the class without written permission from the instructor. Zoom class recordings cannot be downloaded. Exercises and solutions are copyrighted and confidential per the Kellogg Honor Code and cannot be circulated or posted in any form. If you are unsure as to the application of these rules, see the instructor.

Showing your assignments in-class, and in future classes. You and your peers learn from seeing and critiquing the work of others. We assume that we have your permission to show your work in this year's class, and in other future courses as well, because your assignment or presentation may serve as an ideal example of something that others should do, or should not do. We won't show your names in any venue beyond the present class. If there are reasons why we should not do this (e.g. your presentation contains mildly confidential material from your professional life, or you simply prefer to have your assignment omitted), please just let me know – no questions asked.

Further reading: Great books and resources
Leading change (Switch), with sticky ideas (Made to Stick) http://heathbrothers.com/
Presentations that inspire, and tell emotional stories: http://www.duarte.com/perspective/#books
Detailed tutorials of Visual analytics, Communication, and Dashboards:
   http://www.perceptualedge.com/library.php#Books
Data Stories: Fivethirtyeight.com; nyt.com/upshot; pudding.cool
Graphic Design: https://www.youtube.com/watch?v=3U3znpgfcIg
      https://www.amazon.com/Non-Designers-Design-Book-4th/dp/0133966151
      https://blog.datawrapper.de/gendercolor/
See also the 'Optional Readings' folder on canvas for more.

Instructor Bio

Steven Franconeri is leading scientist, teacher, and speaker on visual thinking, communication, and the psychology of data visualization. He is a Professor of Psychology in the Weinberg College of Arts & Sciences at Northwestern, Director of the Northwestern Cognitive Science Program, as well as a Kellogg Professor of Leadership, by Courtesy, and a McCormick School of Engineering and Applied Science Professor of Design, by Courtesy. He is the director of the Visual Thinking Laboratory, where a team of researchers explore how leveraging the visual system - the largest single system in your brain - can help people think, remember, and communicate more efficiently.

His undergraduate training was in computer science and cognitive science at Rutgers University, followed by a Ph.D. in Experimental Psychology from Harvard University, funded by a National Defense Science and Engineering Fellowship, followed by a Walter Isaac Killam Postdoctoral Research Fellowship at the University of British Columbia. His work on both Cognitive Science and Data Visualization has been funded by the National Science Foundation, the Department of Education, and the Department of Defense. He has received a prestigious National Science Foundation CAREER award, given to researchers who combine excellent research with outstanding teaching, and he has received a Psychonomic Society Early Career award for his research on visual thinking.

Franconeri teaches effective presentation, document design, and clear explanations, as well as data visualization both for visual analytics, dashboards, and visual communication of findings, across Ph.D., MBA, and Executive programs at Kellogg, and as private training and consultation within companies and organizations.