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Effective Communication Report

Introduction:

This presentation and report, completed for the Fall 2016 iteration of Statistics 159 *Reproducible and Collaborative Statistical Data Science*, involves the rules that are essential for effective communication. Utilizing provided three articles, *Ten Simple Rules for Better Figures* by Nicolas P. Rougier*, Ten Simple Rules for Making Good Oral Presentation* by Philip Bourne*,* and *Ten Simple Rules for Writing Research Paper* by Weixiong Zhang, we have created a presentation that summarize all the rules that are discussed in the articles. After reading and discussing the content of the articles, we produced a thirty minute presentation to inform audience about the rules of effective communication.

Analysis:

Part 1: Ten Simple Rules For Better Figures

Scientific visualization is the process of graphically displaying scientific data and interpreting data more directly. We would propose ten rules that would be useful to present figures in a more efficient way.

- Rule 1: Know Your Audience
    - Identify audience and the message to convey as early as possible. For example, we should make changes to present data efficiently in following scenarios.
    - Present within group: skip steps that are common sense in the group.
    - Scientific Journal: make the presentation formal and make necessary validation process.
    - Student: explain concepts clearly in full detail
- Rule 2: Identify Your Message
    - Make figures convey ideas in an efficient way. Only include a single concept within a graph
- Rule 3: Adapt the Figure to the Support Medium
    - A figure can be displayed over many sources of media such as a poster, a computer monitor, a projection screen or a paper. Choose the one that best represent the meaning of the graph.
- Rule 4: Captions Are Not Optional

    - A figure should be accompanied by a caption. The caption explains how to read the figure and provides additional precision for what cannot be graphically represented. This can be viewed as oral explanation of a presentation.
- Rule 5: Do Not Trust the Defaults
    - Create plots that are adjusted for use, and do not rely entirely on existing packages and default settings.
- Rule 6: Use Color Effectively
    - Color is an important factor of Human Vision especially for people with good visual memory. Use colors that allow people to track and compare graphs easily and use gradients for appropriate data.
- Rule 7: Do Not Mislead the Reader
    - The main attribute of scientific figure is that it should remain objective. Do not include untestable graphs or make subjective assumptions.
- Rule 8: Avoid "Chartjunk"
    - Chartjunk means all the unnecessary or confusing visual elements found in a figure that do not improve the message or add confusion. For example, extra visual clusters distract from points.
- Rule 9: Message Trumps Beauty
    - Most of the time, designing a new figure is necessary because there is no standard way of describing a particular research. Hence, browsing the scientific literature is a good starting point, but need to focus on delivering correct and main message through the time.
- Rule 10: Get the Right Tool
    - Use the right tool for a particular project and choose the one you are most familiar with among all the available options such as Matplotlib, R, Inkscape, TikZ and PGF, GIMP, ImageMagick, and D3.js.

Part 2: Ten Simple Rules For Making Good Oral Presentations

Clear and logical delivery of ideas and scientific results is an important component of a scientific research. Presentations encourage broader dissemination of your work and highlight work that may not receive attention in written form.

- Rule 1: Talk to the Audience
    - Make eye contact with audience as much as possible. Know the audience in advance and their knowledge level.
- Rule 2: Less Is More
    - Clear and concise presentation that leads to open-ended discussion. Too much information within a short time period may lead to loss of main points and unclear presentation.

- Rule 3: Only Talk When You Have Something to Say
    - Always value audience's time and only convey concepts that are essential to present materials
- Rule 4: Make the Take-Home Message Persistent
    - Emphasize on main points through presentation so that audiences are able to recall the main points of the presentation after the presentation.
- Rule 5: Be Logical
    - View presentation as story. There is a logical flow—a clear beginning, middle, and an end which should be a procedure when presenting
- Rule 6: Treat the Floor as a Stage
    - Presentation should be entertaining and not boring, but presenters should understand the limit
- Rule 7: Practice and Time Your Presentation
    - Especially for beginners, make more practice before presentation and manage the time flow for each part before presentation.
- Rule 8: Use Visuals Sparingly but Effectively
    - Visuals are sometimes necessary and can be really efficient for audience to understand concepts.
- Rule 9: Review Audio and/or Video of Your Presentations
    - It is efficient to listen to the audio of your presentation and correct mistakes you may possibly make during presentation..
- Rule 10: Provide Appropriate Acknowledgments
    - Acknowledge all resources you use for the presentation and cite them properly.

Part 3: Ten Simple Rules For Writing Research Papers

Writing and publishing a paper has its own life cycle; properly following a course of action and avoiding missteps can be vital to the overall success not only of a paper but of the underlying research as well.

- Rule 1: Make It a Driving Force
    - Never separate writing a paper from the underlying research. Keep focus on the major topic to keep on track on research.
- Rule 2: Less Is More
    - It is often the case that we have more than one hypothesis for one project or we have more than one deliverable for one project. It is important to always focus on the main topic to avoid paying too much attention on trivial things.
- Rule 3: Pick the Right Audience

    - Depending on the scale and deliverables of your research, pick the correct audience who are interested in the topic and are able to understand efficiently.
- Rule 4: Be Logical
    - Maintain a consistent style of through the research, and convey every concepts from beginning to end in a clear way that audience would understand
- Rule 5: Be Thorough and Make It Complete
    - Hypothesis must be supported with relevant data throughout the argument. Interpret and analyze results not just present. The research should be self-contained along with complementary figures and tables.
- Rule 6: Be Concise
    - Being thorough is not a license to writing that is unnecessarily descriptive, repetitive, or lengthy.
- Rule 7: Be Artistic
    - A paper presented artistically will give readers a positive initial impression of your passion toward the research and the quality of the work, which will work in your favor in the reviewing process.
- Rule 8: Be Your Own Judge
    - Revising your own paper several times. It is a rewarding process before publishment as you may get more insight of the problem through the process.
- Rule 9: Test the Water in Your Own Backyard
    - Ask advice and opinions from peers immediately for feedback, and adjust your research paper accordingly.
- Rule 10: Build a Virtual Team of Collaborators
    - Accept honest feedback and be able to accept failure through the process. Use the mistake to make yourself better.

Conclusion:

The report, combined with our presentation, discussed in depth about rules to have effective communication skills in both presenting and in writing research paper. Specifically, we proposed ten rules for each three topics in presenting figures, oral presentation and writing research paper. With these rules, we would be able to present our results in a more efficient and concise way.

References:

Philip E. Bourne: Ten Simple Rules for Making Good Oral Presentations
Weixiong Zhang: Ten Simple Rules for Writing Research Papers
Nicolas P. Rougier: Tem Simple Rules for Better Figures
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