

# Alumni Writing in Statistics



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## Overview:

This research aims to increase understanding of what alumni writing in statistics careers looks like to better plan curriculum that prepares statistics majors for professional writing. The Guidelines for Assessment and Instruction in Statistics Education (GAISE) Report provides brief recommendations on writing for assessments and provides encouragement to use written assignments as they “can help students strengthen their knowledge of statistical concepts and practice good communication skills” (2016, p.22).

Francis (2005) highlights that instructors often assume students can write reports, but students find report writing difficult. Radke-Sharpe (1991) states that “successfully integrating writing assignments into statistics curriculum may not be easy, since it is important that the writing be viewed as a necessary and core aspect of the learning process” (p. 293). Our goal is to better understand how to prepare statistics students for writing in their careers.

## Methods:

An online survey in Google Forms was sent to 122 alumni who graduated with degrees in statistics from our university. All alumni had graduated between 2011 and 2021. The survey was deployed in February 2023 and asked questions about demographics and writing. There were 18 items on the survey including multiple-choice, short answer, and free response questions. A reminder email was sent to alumni in March 2023.

## Demographics:

- 17 voluntary responses (response rate of 13.9%)
- Alumni from 2013 to 2021 responded (majority graduated since 2019)
- Most common degree from respondents was a B.S. degree in Statistics
- Six participants completed graduate work
- 82% of participants indicated that they are either currently employed or have been employed in a position related to statistics
- Positions held include biostatistician, research/consulting/sales strategy analysts, programmer, and data scientist.

## Background:

One of our program’s six learning goals relates to communication: *Explain statistical ideas, methods and results in writing, orally, and visually to non-statistical audiences.*

Our institution completed a Writing Excellence Initiative as part of a Quality Enhancement Program in Fall 2013.

Writing appears in our program as:

- Semester-long or multiple smaller written reports in applied statistics courses. Primarily completed in teams.
- Capstone experiences that requires either a reflection paper, academic paper, or team-based consulting report.
- Portfolio completed by seniors with samples of their work across their undergraduate coursework with reflections associated with their statistics core and their concentrations. Students also include a resume and cover letter (or personal statement).

The following summarizes the top themes for several key questions asked of alumni in statistics careers (n = 14). The question about writing struggles also included responses from students in graduate school (n = 16).

## Forms of Writing:

- Emails (n = 9, 64.3%)
- Write-ups/reports (n = 9, 64.3%)
- Presentations (n = 8, 57.1%)
- Memorandums (n = 4, 28.6%)

Most alumni (n = 11, 78.6%) identified other forms of writing including, but not limited to, training guides, forum posts, minutes, literature reviews, surveys, coding, analysis plans, and protocol inputs.

## Audience:

- Clients (n = 11, 78.6%)
- Peers/other employees (n = 12, 85.7%)
- Senior leadership/boss (n = 6, 42.9%)
- General public (n = 3, 21.4%)

For at least one response, it was unclear if clients were different audiences from the categories listed previously. Future studies should clarify this point.

## Typical Writing About Data:

- Overview/summary of results (n = 9, 64.3%)
- Talking to a non-statistical audiences (n = 7, 50.0%)
- Discussing descriptive statistics (n = 4, 28.6%)

Grouping all the statistical results together, 12 (85.7%) indicated that they discussed statistics in some way (the remaining two either just coded or discussed predictive models, but not necessarily the results).

## Professional Writing Struggles:

- No struggles identified (n = 5, 31.3%)
- Being concise or summarizing key points (n = 5, 31.3%)
- Writing to different audiences (n = 3, 18.8%)

Alumni offered a variety of specific struggles that included data visualization, reading other studies and synthesizing the information, writing professional manuscripts, and writing for clinical trials.

## Quotes from Alumni:

“[What] helped my writing the most was the **portfolio** in order to graduate. Mainly because you were supposed to write it as if the person reading didn’t know statistics and that’s what I do to this day so I think all the papers that we did write should have been geared to that...”

“[M]any projects in the Statistical Modeling and Design and Analysis of Experiments courses helped **practice statistical writing.**” (*Project elements can include proposals, pilot studies, preliminary analyses, written reports, presentations, and executive summaries.*)

“Writing statistical or research papers helped a lot. Mainly the **introduction and executive summary** areas because this is where you need to be clear and **concise** in your writing and make sure that any audience can comprehend your research.”

“Papers that focused on **real-world data**, identifying **key takeaways** and communicating them clearly both to statistical and non-statistical **audiences** were most helpful.”

“Writing **concisely**. Writing a long report I’ve found is easy (especially like a Statistics report), but writing a simple 2-3 page policy brief is extremely difficult.”

## Potential Updates to Curriculum:

- Creation of simplified departmental style guide
- More individual writing opportunities
- Shorter writing assignments that encourage being concise or summarizing
- More writing experiences targeting different audiences, especially authentic non-statistical audiences
- More variety of writing activities focusing on communication (e.g., emails, memorandums, abstracts, and presentations)

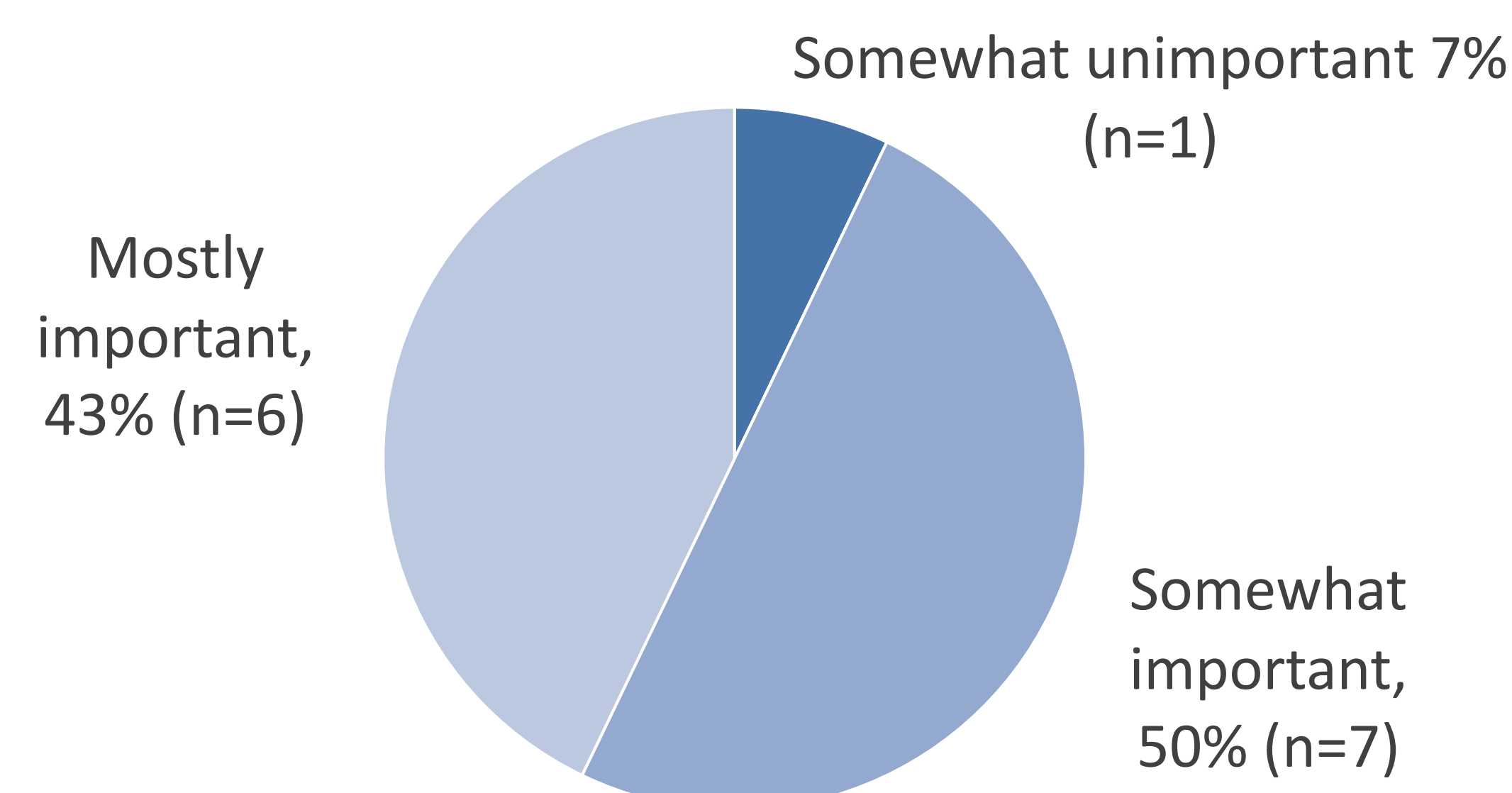
## References:

Francis, G. (2005, April). An approach to report writing in statistics courses. In Proceedings of the IASE Satellite Conference on Statistics Education and the Communication of Statistics. Voorburg, The Netherlands: International Statistical Institute.

GAISE College Report ASA Revision Committee, “Guidelines for Assessment and Instruction in Statistics Education College Report 2016,” <http://www.amstat.org/education/gaise>.

Radke-Sharpe, N. (1991), “Writing as a Component of Statistics Education,” *The American Statistician*, 45, 292–293. DOI: 10.2307/2684457.

How Important is the Ability to Write about Data and Statistics in Your Position?



What Percent of Your Time in Your Position Involved Writing in a Typical Week?

