

Updating the Guidelines for Assessment and Instruction in Statistics Education College Report

In 2005, the [Guidelines for Assessment and Instruction in Statistics Education](#) (GAISE) College Report was endorsed by the American Statistical Association (ASA). Although the original six recommendations put forward in this report have stood the test of time, we now live in an increasingly data-centric world where our students have access to technologies that were not in existence in 2005. The ASA has therefore made it a priority to revise GAISE so that it continues to be easily and clearly applicable to modern-day teachers of introductory statistics courses. To accomplish this goal, a committee was formed and charged with the task of updating this landmark report.

The committee welcomes your feedback on our proposed revisions. A draft of the full report is expected to be sent out for feedback in early 2016. Feedback can also be sent to the committee chair, Michelle Everson, at everson.50@osu.edu

Suggestion 1: We continue to endorse the original six GAISE recommendations put forth in 2005; no recommendations will be added or changed. However, we are considering some re-wording

1. emphasize statistical thinking*;
2. use real data with a context and a purpose;
3. focus on conceptual understanding, rather than application of procedures;
4. foster active learning;
5. use technology for developing conceptual understanding and for analyzing data; and
6. use assessments to improve as well as to evaluate student learning.

*Note that we would especially like feedback on this recommendation. We have wrestled with the wording of this recommendation. It appears that some feel the original recommendation to “emphasize statistical literacy and statistical thinking” might be too confusing and might appear to get at two very different things. There is concern that not everyone may understand what is meant by “statistical literacy” and “statistical thinking.” We could add some text to define each term (e.g., “emphasize statistical literacy (understanding of statistics presented in the media) and statistical thinking (exploring an unsolved real world problem using statistically based investigations and logic)”), but this would yield a recommendation that is quite long compared to the others. We essentially want to be sure to include both “Stat 100”- and “Stat 101”-type courses, aimed at both consumers and producers of statistical analyses.

Suggestion 2: We will highlight the changing landscape in Statistics Education. In particular, we will discuss

- o changes in the number of students who are studying statistics
- o changes in the statistics curriculum in Grades 6-12 (based on the Common Core State Standards)
- o changes in the way data is collected and used (e.g., issues related to “big data”)
- o the emergence of “data science” as a discipline
- o new and better options for technology in general and in particular for learning statistics
- o alternative learning environments for learning statistics
- o different ways to view and think about the statistics curriculum (e.g., considering a randomization-based curriculum as a way of teaching ideas of inference).

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Suggestion 3: We will suggest two areas of emphasis:

- o Teaching statistics as science rather than as mathematics (Scientific Thinking)
- o Providing students with experience with multi-variable thinking (Multivariate Thinking)

Suggestion 4: Many of the “goals for students in an introductory course” will remain the same; some new emphasis will be given to the goals of helping students to become intelligent readers of statistically-based results, allowing students to participate in discussions of ethics relevant to statistics, and providing students with opportunities to gain an appreciation of, and some experience with, the use of computers in statistics. There has also been some discussion about a goal related to helping students understand certain measurement issues (such as reliability and validity).

- We will share thoughts on possible topics that could be removed from the first course
- We will emphasize the need to think about how the GAISE recommendations can be applied beyond the first course
- We will focus on writing out the goals in the form of learning outcomes/objectives

Suggestion 5: Each of the six recommendations will be described in more detail, with newer examples and links to newer scholarship.

Suggestion 6: There will be several updated appendices with many new examples of learning activities and assessment items.

- o Many of the appendices will be updated versions of the appendices in the original report (which emphasized examples of activities and projects, examples of assessment items, examples of using technology, and examples of real (as compared to naked or realistic, data).
- o There will also be a new appendix which provides examples of different delivery methods or different settings in which an introductory statistics course can be taught (e.g., face-to-face, flipped, online, team-based learning) and how the recommendations can be applied in those different settings, both with smaller groups of students and with larger classes.
- o There may also be a new “History of STAT 101” appendix, containing considerable material from the introduction to the 2005 report.
- o Because of the many changes in technology over the last decade, the technology appendix will emphasize six forms of technology: Interactive applets, Real time response systems, Statistical software, Accessing real experimental data online, Accessing real survey data online, and Using games and other virtual environments.

Ed. This update was provided as background for those taking the online survey.

Survey link: www.surveymonkey.com/r/?sm=3ik3i56Wntn3OIsOnKRzZBIWcTsZDs13IXlw47WqbzU%3D
That survey is now closed.