Block 27

Statistics Teaching Inventory

This revised inventory is being used to obtain information about the teaching and assessment practices of introductory statistics teachers. The data collected from this survey will be used to inform the broader statistics education community about current pedagogical, assessment, and curricular trends.

If you agree to participate, you will be asked about the pedagogy employed and student learning outcomes in your introductory statistics course. You will also be asked to respond to items related to curricular content in the course (e.g., the use of data and technology, computation and simulation).

By continuing to the survey, you are consenting to participate in this research. Your responses, which will remain de-identified, will be recorded and saved in a log-in secured database. Only summaries of the data will be reported. A copy of the full consent form is available here.

We expect that this survey will take you less than 20 minutes to complete.

Introduction

As you complete the Statistics Teaching Inventory please do so in reference to a single section of an introductory statistics course that you teach (or have recently taught). For example, if there are multiple sections of this course that differ in their pedagogy/content (e.g., online, face-to-face), consider one. Note that the course name you enter will be used throughout the survey to guide your responses, but will be deleted from the data as part of the de-identification process.

Please enter the name of this course:

Block 3

Pedagogical Practices

The purpose of this section is to obtain information about the pedagogy used in *${q://QID1/ChoiceTextEntryValue}*.

Pedagogy

The purpose of this section is to obtain information about the **pedagogical practices** used in *${q://QID1/ChoiceTextEntryValue}*. To what extent do you agree or disagree with the following statements?

	Strongly Disagree	Disagree	Agree	Strongly Agree
The course content is				

presented primarily through the instructor/TA lectures.	○	○	○	○
The course content is presented primarily through student activities.	○	○	○	○
The course frequently requires students to work together to complete classroom work/activities.	○	○	○	○
	Strongly Disagree	Disagree	Agree	Strongly Agree
The course frequently requires students to work together to complete assessments (e.g., homework, quizzes, exams).	○	○	○	○
This course encourages students to discover ideas on their own.	○	○	○	○
This course often used technology (e.g., web applets, statistical software) to help students understand concepts.	○	○	○	○

Block 34

Student Learning Outcomes

The purpose of this section is to obtain information about the student learning outcomes addressed in the curriculum and assessment content of *${q://QID1/ChoiceTextEntryValue}*.

Curricular Emphasis - General

How much emphasis is placed on each of the following **general student learning outcomes** in *${q://QID1/ChoiceTextEntryValue}*?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Students will understand the importance of variability in the field of statistics	○	○	○	○
Students will be able to critically consume statistically-based results reported in popular media	○	○	○	○
Students will be exposed to ethical issues associated with statistical practice	○	○	○	○

Curricular Emphasis - Graphs & Summaries

How much emphasis is placed on each of the following **student learning outcomes related to data visualization** in *${q://QID1/ChoiceTextEntryValue}*?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis

Produce visualizations of *univariate data by hand*	○	○	○	○
Produce visualizations of *univariate data with technology*	○	○	○	○
Interpret visualization of *univariate data*	○	○	○	○
Produce visualizations of *bivariate data by hand*	○	○	○	○
Produce visualizations of *bivariate data with technology*	○	○	○	○

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Interpret visualization of *bivariate data*	○	○	○	○
Produce visualizations of *multivariate data by hand* (three or more variables)	○	○	○	○
Produce visualizations of *multivariate data with technology* (three or more variables)	○	○	○	○
Interpret visualization of *multivariate data* (three or more variables)	○	○	○	○

How much emphasis is placed on each of the following **student learning outcomes related to numerical summaries** in *${q://QID1/ChoiceTextEntryValue}*?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis

Produce numerical summaries of *univariate data by hand*	○	○	○	○
Produce numerical summaries of *univariate data with technology*	○	○	○	○
Interpret numerical summaries of *univariate data*	○	○	○	○
Produce numerical summaries of *bivariate data by hand* (e.g., correlation, regression)	○	○	○	○
Produce numerical summaries of *bivariate data with technology* (e.g., correlation, regression)	○	○	○	○

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Interpret numerical summaries of *bivariate data* (e.g., correlation, regression)	○	○	○	○
Produce numerical summaries of *multivariate data by hand* (e.g., correlation conditioned on a third variable)	○	○	○	○
Produce numerical summaries of *multivariate data with technology* (e.g., correlation conditioned on a third variable)	○	○	○	○
Interpret numerical				

summaries of *multivariate data* (e.g., correlation conditioned on a third variable)	○	○	○	○

Curricular Emphasis - Design

How much emphasis is placed on each of the following **student learning outcomes related to study design** in *${q://QID1/ChoiceTextEntryValue}*?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Understand the benefits of ***random sampling*** in designing studies and drawing conclusions	○	○	○	○
Understand the benefits of ***random assignment*** in designing studies and drawing conclusions	○	○	○	○

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Recognize whether reported results reasonably follow from the study and analysis conducted	○	○	○	○

Curricular Emphasis - Statistical Inference

How much emphasis is placed on each of the following **student learning outcomes related to statistical inference** in *${q://QID1/ChoiceTextEntryValue}*?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Use hypothesis tests for statistical inference	○	○	○	○
Use interval estimation for statistical inference	○	○	○	○
Understand the role of a statistical model in statistical inference (e.g., assumptions)	○	○	○	○
Understand the limitations of statistical inference (e.g., based on study design, sample size)	○	○	○	○

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Communicate appropriate results of inferential procedures	○	○	○	○
Use tables for statistical inference (to find critical values, *p*-values, etc.)	○	○	○	○
Use *p*-values below a particular threshold for decision making	○	○	○	○
Supplementing *p-values* with other summaries (e.g., effect size, relative risk)	○	○	○	○

Curricular Emphasis - Statistical Investigation

How much emphasis is placed on each of the following **student learning outcomes related to the cycle of statistical investigation** in *${q://QID1/ChoiceTextEntryValue}*?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Posing a question	○	○	○	○
Designing a study	○	○	○	○
Collecting data	○	○	○	○
Analyzing data	○	○	○	○
Drawing conclusions	○	○	○	○
Communicating results	○	○	○	○

How much emphasis is placed on each of the following **statistical topics** in *${q://QID1/ChoiceTextEntryValue}*?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Bayesian ideas/methods	○	○	○	○
Causal models (e.g., directed acyclic graphs)	○	○	○	○
Contemporary visualizations (e.g., interactive graphics, violin plots)	○	○	○	○
Covariates (e.g., statistical control/adjustment)	○	○	○	○

Unsupervised learning methods (e.g., clustering)	○	○	○	○

Block 30

Datasets and Data Practices

The purpose of this section is to obtain information about the datasets and data practices used in *${q://QID1/ChoiceTextEntryValue}*.

Real Data

Of all the **datasets** students see in *${q://QID1/ChoiceTextEntryValue}*, estimate how many **meet the following criteria**?

	None	A few	About half	Most	All
Real data	○	○	○	○	○
Includes multiple types of attributes (quantitative, categorical, etc.)	○	○	○	○	○
Collected by students	○	○	○	○	○
Includes 100–1,000 cases/observations/subjects	○	○	○	○	○

	None	A few	About half	Most	All
Includes more than 1,000 cases/observations/subjects	○	○	○	○	○
Includes 2 variables/attributes	○	○	○	○	○

Includes 3 variables	○	○	○	○	○
Includes more than 3 variables	○	○	○	○	○

Data Practices

Consider the **data practices** in *${q://QID1/ChoiceTextEntryValue}*. How much emphasis is placed on having students do each of the following?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Plan data collection (e.g., make decisions about what data will be recorded, how it will be recorded)	○	○	○	○
Work with a data codebook	○	○	○	○
Use data stored in a flat file (e.g., CSV, TXT, SAV)	○	○	○	○
Use data stored in a relational database (e.g., mySQL)	○	○	○	○

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Collect data via web scraping	○	○	○	○
Validate data (e.g., range checking, variable type)	○	○	○	○
Clean data (e.g., error				

coding, recoding, duplicate case elimination)	○	○	○	○
Structure data (e.g., reshaping, filtering, subsetting)	○	○	○	○

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Join/merge multiple datasets together	○	○	○	○
Generate data from a model (e.g., random sample from a Normal distribution)	○	○	○	○
Generate data from a sample (e.g., bootstrapping, randomizing)	○	○	○	○

Block 32

Technology Tools Used to Analyze Data

The purpose of this section is to obtain information about the technology tools students use to analyze data in *${q://QID1/ChoiceTextEntryValue}*.

Course Technology

Which of the following best describes the **primary technology tool(s) students use to analyze data** in *${q://QID1/ChoiceTextEntryValue}*? (If there is more than one, check all that apply.)

	No	Yes
Calculator without built-in statistical functions	○	○
Calculator with built-in statistical functions	○	○
Desktop/Web-based software	○	○

Block 35

What are your reasons for not using technology other than graphing calculators in *${q://QID1/ChoiceTextEntryValue}*? (Select all that apply.)

	No	Yes
There is no computer technology available	○	○
There are course/institutional constraints on technology use	○	○
There is not enough time	○	○
Students are not comfortable enough or skilled enough with technology tools	○	○
I am not comfortable enough or skilled enough with technology tools	○	○
Other	○	○

Please describe your reasons for not using technology other than graphing calculators in *${q://QID1/ChoiceTextEntryValue}*.

Calculator

Although students only use a calculator to analyze data in *${q://QID1/ChoiceTextEntryValue}*, are they provided the **opportunity to read/interpret computerized output from analyses performed with a statistical package** (or from generic output designed to mimic those results)?

- ○ No
- ○ Yes

Do students use the following **desktop- or web-based applications/software to analyze data** in *${q://QID1/ChoiceTextEntryValue}*?

	No	Yes
CODAP	○	○
Excel	○	○
Fathom	○	○
JMP	○	○
Minitab	○	○
Python	○	○
R GUI	○	○
R with R Studio / R Studio Server	○	○

R Studio Cloud	○	○
SAS	○	○
SAS Studio / University Edition SAS	○	○
SPSS	○	○
Stata	○	○
StatCrunch	○	○
Statkey	○	○
Tableau	○	○
TinkerPlots	○	○
Other	○	○

Please list any other software used by students to analyze data in *${q://QID1/ChoiceTextEntryValue}*.

Which of the following grammars are used by students in *${q://QID1/ChoiceTextEntryValue}* to **work with data***?*

	No	Yes
Base R (e.g., $ notation, indexing with square brackets)	○	○
Mosaic (e.g., df_stat() function)	○	○

Tidyverse (e.g., dplyr)	○	○
Other	○	○

Please indicate what other grammar(s) you use to work with data.

Which of the following grammars are used by students in *${q://QID1/ChoiceTextEntryValue}* to **visualize data**?

	No	Yes
Base R (e.g., plot() function)	○	○
Mosaic/ggformula	○	○
Tidyverse (e.g.,ggplot)	○	○
Other	○	○

Please indicate what other grammar(s) you use to visualize data.

Do you have students use any of the following in *${q://QID1/ChoiceTextEntryValue}*?

	No	Yes
Git/Github	○	○

Jupyter Notebooks	○	○
LearnR tutorials	○	○
R Markdown documents/notebooks	○	○
Shiny Apps	○	○

Block 33

Simulation

The purpose of this section is to obtain information about the degree to which students use, evaluate, design, or construct simulations in *${q://QID1/ChoiceTextEntryValue}*.

Modeling & Simulation Practices

Do students encounter or work with simulations (e.g., resampling, bootstrapping) in *${q://QID1/ChoiceTextEntryValue}*?

○ No
○ Yes

Conditional Modeling and Simulation

How much emphasis is placed on having **students use simulation** in *${q://QID1/ChoiceTextEntryValue}* to do each of the following?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Advance their understanding of statistical concepts through interacting with a simulation	○	○	○	○
Evaluate a conjecture/claim about a real-world phenomenon	○	○	○	○
Evaluate competing conjectures/claims about a real-world phenomenon	○	○	○	○
Draw a conclusion	○	○	○	○

Evaluate Simulations

How much emphasis is placed on each of the following when **students evaluate simulations** in *${q://QID1/ChoiceTextEntryValue}*?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Identify similarities/differences between the simulation and the real-world phenomenon being simulated	○	○	○	○
Describe how the design of the simulation (e.g., assumptions, choices) impact the conclusions drawn	○	○	○	○

Constructing Simulations

Design Simulation

How much emphasis is placed on each of the following when **students design computer simulations** in *${q://QID1/ChoiceTextEntryValue}*?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Identify elements of the real-world phenomena that will be included in the simulation	○	○	○	○
Decide what data will be produced by the simulation	○	○	○	○

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Understand how the assumptions of the simulation impact the conclusions that can be drawn about the real-world phenomena	○	○	○	○

Block 34

Computation

The purpose of this section is to obtain information about the degree to which students experience computation in *${q://QID1/ChoiceTextEntryValue}*.

Computational Syntax

In ${q://QID1/ChoiceTextEntryValue}, do students work with code/syntax?

- ○ No
- ○ Yes

Conditioned Computational Syntax

How much emphasis is placed on each of the following when **students work with code/syntax** in *${q://QID1/ChoiceTextEntryValue}*?

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Read and understand code/syntax	○	○	○	○
Modify existing code/syntax	○	○	○	○

	No Emphasis	Minor Emphasis	Moderate Emphasis	Major Emphasis
Debugging code/syntax	○	○	○	○
Create code/syntax from scratch	○	○	○	○

Block 35

Assessment

The purpose of this section is to obtain information about the assessment practices used in

${q://QID1/ChoiceTextEntryValue}.

Assessment

To what extent do you agree or disagree with the following statements about **assessments used** in *${q://QID1/ChoiceTextEntryValue}*?

	Strongly Disagree	Disagree	Agree	Strongly Agree
Students are assessed on procedural skills (e.g., calculate a standard error).	○	○	○	○
Students are assessed on reasoning about key statistical ideas (e.g., explain how sample size impacts uncertainty).	○	○	○	○

	Strongly Disagree	Disagree	Agree	Strongly Agree
Students are assessed on ability to critically evaluate statistically-based results reported in popular media.	○	○	○	○
Students are assessed using formative assessments (assessments not used to determine a student's grade) to monitor/improve their understanding.	○	○	○	○

Block 34

Course and Instructor Characteristics

The purpose of this section is to obtain characteristics about *${q://QID1/ChoiceTextEntryValue}*, including institutional and instructor information.

Course and Instructor Characteristics

Which of the following best describes the teaching format of *${q://QID1/ChoiceTextEntryValue}*?

- ○ Face-to-face
- ○ Online
- ○ Hybrid

Approximately how many students were enrolled in *${q://QID1/ChoiceTextEntryValue}* the last time the course was offered? (Note: If the course has both a lecture and lab/recitation section, provide the enrollment for the lecture section.)

Do you use an open source textbook in *${q://QID1/ChoiceTextEntryValue}?*

- ○ No
- ○ Yes

Course Characteristics Part II

Do you have teaching assistants who help with *${q://QID1/ChoiceTextEntryValue}*?

- ○ No
- ○ Yes

Do your teaching assistants take on any of the following roles and responsibilities in *${q://QID1/ChoiceTextEntryValue}*?

	No	Yes
Facilitate discussions/activities	○	○
Grade assignments	○	○
Hold office hours	○	○
Lead recitation/lab sessions	○	○
Lead lecture sessions	○	○
Respond to student questions outside of class (e.g., e-mail)	○	○
Other	○	○

Please indicate other responsibilities your teaching assistants have in *${q://QID1/ChoiceTextEntryValue}*?

Course Characteristics Part III

Which constraints, if any, keep you from updating the content or assessments used in *${q://QID1/ChoiceTextEntryValue}*?

	No	Yes
Personal time	○	○
Departmental/institutional requirements (e.g., stakeholders)	○	○
External requirements (e.g., transfer requirements, state requirements),	○	○
Student characteristics (e.g., ability, interest)	○	○
Technology (e.g., lack of computer lab, cost of software)	○	○
Textbook	○	○
Other	○	○

Please identify any other constraints that keep you from updating the content or assessments used in *${q://QID1/ChoiceTextEntryValue}*.

Course Characteristics Part IV

How would you classify the institution at which you teach statistics?

- ○ Two-year college
- ○ Four-year college
- ○ University (grant advanced degrees)
- ○ Other

Please classify the institution at which you teach statistics.

What is the primary classification of the department in which you teach statistics?

- ○ Biostatistics
- ○ Business
- ○ Data Science
- ○ Economics
- ○ Educational Psychology/Educational Statistics
- ○ Mathematics
- ○ Mathematics Education
- ○ Psychology
- ○ Sociology
- ○ Statistics/Combined departments that include “statistics” (e.g., Mathematics and Statistics)
- ○ Other

Please classify the department in which you teach statistics.

What is your institutional position?

- ○ Adjunct faculty/Instructional staff (part-time)
- ○ Adjunct faculty/Instructional staff (full-time)
- ○ Faculty, non-tenure track
- ○ Faculty, tenure-track
- ○ Faculty, tenured
- ○ Graduate student
- ○ High school teacher
- ○ Other

Please classify your institutional position.

How many years have you taught statistics/data science?

- ○ 0–5
- ○ 6–10
- ○ 11–20
- ○ 21–30
- ○ 31+

What additional comments, if any, do you have?