Advances in Biology Laboratory Education, A Publication of the Association for Biology Laboratory Education
Volume 46, Extended Abstract 29, 2026

Statistics and data visualization in CUREs

Ania A. Majewska[1]

[1]Southeastern Cooperative Wildlife Disease Study, Population Health, College of Veterinary Medicine, University of Georgia, Athens, GA 30602, USA

Extended Abstract

Course-based undergraduate research experiences (CUREs) often require that students engage in data analysis, visualization, and interpretation (Brownell and Kloser 2015; Corwin et al. 2015), yet teaching these skills within a CURE is challenging due to time constraints. Readily available tools such as Microsoft Excel or Google Sheets are helpful for storing data and programming languages such as R and Python are preferred options for data analysis and visualization and reproducibility. However, the amount of time necessary to learn coding is prohibitive for a CURE. This workshop introduced DataClassroom.com, a web-app for data analysis and visualization that bridges the gap between Excel and more advanced programming tools. DataClassroom.com is designed to actively engage students with data and progressive skill building through curated datasets and associated lesson plans. The instructor can use the platform to scaffold activities and assignments that align with common CURE learning objectives. For example, an instructor can choose a subject (e.g., Biology, Environmental Science) or a statistical test (e.g., t-tests, Chi-square, linear regression) that aligns with their CURE and use it as an introduction to the platform. It is recommended that instructors walk the students through the first login to allow familiarization with the steps of using the platform (see Supplemental Material for step-by-step instructions for students). In order to use the platform, all users must create an account. A key requirement is proper data formatting: data analysis and visualization in DataClassroom.com is only possible with data in "tidy format", where each variable forms a column and each observation forms a row (Wickham 2014). In DataClassroom.com, data files can be imported and shared among users and within a "class" setup by the instructor with "members", or students added via email addresses. Because data format is important, it provides an opportunity to discuss best practices for entering and managing data, including naming columns consistently, using consistent formats, codes, spellings in a single column, and using data validation tools in Excel (see Supplemental Material for data formatting and best practices). Further, since the platform provides graphing options, it also offers an opportunity to discuss an appropriate plot for given data. DataClassroom.com generates high-quality, customizable graphs that are suitable for student reports and even scientific publication. Finally, the statistical tests are scaffolded with progression from descriptive to inferential statistics that provide an interpretation of the tests. A key consideration for using DataClassroom.com is the subscription cost for the students, which at the time of writing this abstract is $37 per year. Overall, DataClassroom.com is a valuable tool for CURE instructors who want to incorporate data literacy into their courses without requiring students to learn programming languages.

CITED REFERENCES

Brownell SE, Kloser MJ. 2015. Toward a conceptual framework for measuring the effectiveness of course-based undergraduate research experiences in undergraduate biology. Studies in Higher Education. 40(3):525-544.

Corwin LA, Graham MJ, Dolan EL. 2015. Modeling course-based undergraduate research experiences: An agenda for future research and evaluation. CBE—Life Sciences Education. 14(1):es1.

Wickham H. 2014. Tidy data. Journal of statistical software. 59:1-23.

Keywords: data analysis, data literacy, figures, quantitative skills

Link to Supplemental Materials: https://doi.org/10.37590/able.v46.sup29

Citation: Majewska. AA. 2026. Statistics and data visualization in CUREs. Extended abstract 29 in: Cole M and O'Brien J, eds. *Advances in biology laboratory education*. Volume 46. Publication of the 46th Conference of the Association for Biology Laboratory Education (ABLE). DOI: https://doi.org/10.37590/able.v46.extabs29

Correspondence to: Ania A. Majewska, majewska@uga.edu

Mission, Review Process & Disclaimer

The Association for Biology Laboratory Education (ABLE) was founded in 1979 to promote information exchange among university and college educators actively concerned with teaching biology in a laboratory setting. The focus of ABLE is to improve the undergraduate biology laboratory experience by promoting the development and dissemination of interesting, innovative, and reliable laboratory exercises. For more information about ABLE, please visit https://www.ableweb.org/.

Papers published in *Advances in Biology Laboratory Education: Peer-Reviewed Publication of the Conference of the Association for Biology Laboratory Education* are evaluated and selected by a committee prior to presentation at the conference, peer-reviewed by participants at the conference, and edited by members of the ABLE Editorial Board.

Compilation © 2026 by the Association for Biology Laboratory Education, ISSN 2769-1810. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the copyright owner. ABLE strongly encourages individuals to use the exercises in this volume in their teaching program. If this exercise is used solely at one's own institution with no intent for profit, it is excluded from the preceding copyright restriction, unless otherwise noted on the copyright notice of the individual chapter in this volume. Proper credit to this publication must be included in your laboratory outline for each use; a sample citation is given below the abstract.