Investigating Instructional Strategies in Introductory Statistics

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Recommendations for the teaching and learning of introductory statistics at the tertiary level have been set forth by the research community, including recommendations outlining desirable pedagogical strategies, such as the use of student-centered instruction and the integration of technology and resampling methods to support the development of students' conceptual understanding. Yet, surprisingly little is known about how introductory statistics is being taught at colleges and universities across the United States. The research presented here aims to shed light on these aspects of the introductory statistics course by reporting preliminary findings from an instructor survey that was recently completed by 148 instructors nationwide.

Keywords: Instructional Strategies, Introductory Statistics

The importance of teaching for conceptual understanding has been stressed in mathematics and statistics education research at both the K-12 and college level. To support the development of students' ability to think and reason with data, researchers have set forth recommendations for the teaching and learning of statistics, including recommendations that instructors foster active learning and leverage technology as part of their instructional approach (ASA GAISE College Report Revision Committee, 2017). Additionally, emerging empirical evidence suggests that teaching statistics using simulations and resampling methods has the potential to support student learning of statistics (Hildreth, Robison-Cox, & Schmidt, 2018). Since statistics is one of the fastest growing undergraduate degrees of any STEM disciplines (ASA GAISE College Report Revision Committee, 2017), it is important that we understand if the pedagogical strategies used by instructors align with the recommendations made by researchers.

Based on a nationwide cluster sample, instructors from 80 selected universities were surveyed in Spring 2018, resulting in 148 participants (response rate 27.2%). Preliminary findings show that of these 148 instructors, 64% use lecture as their primary instructional format while approximately 28% integrate some form of active learning as part of their instruction (i.e., problem-based learning, inquiry oriented instruction, etc.). Additionally, despite calls for use of statistical software and technology to support student learning, only 46% of instructors report using technology as a fundamental or supplemental part of their course, with many limiting the use of technology to graphing calculators. As part of our poster presentation we will expand on these findings and report on how institutional and instructor characteristics relate to how statistics is being taught in these courses.

References

ASA GAISE College Report Revision Committee. (2017). *Guidelines for assessment and instruction in statistics education (GAISE): College report 2016.* Alexandria, VA: American Statistical Association. Hildreth, L. A., Robison-Cox, J., & Schmidt, J. (2018). Comparing student success and understanding in Introductory Statistics under consensus and simulation-based curricula. *Statistics Education Research Journal*, *17*(1), 103-120.