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A comparison of student attitudes, statistical reasoning, performance, and perceptions for web-augmented traditional, fully online, and flipped sections of a statistical literacy class.
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Summary: Web-augmented traditional lecture, fully online, and flipped sections, all taught by the same instructor with the same course schedule, assignments, and exams in the same semester, were compared with regards to student attitudes; statistical reasoning; performance on common exams, homework, and projects; and perceptions of the course and instructor. The Survey of Attitudes Toward Statistics-36 (SATS-36) instrument and eight questions from the Statistical Reasoning Assessment (SRA) were given both at the beginning and end of the semester to measure change. The students selected their own sections, but the students in the sections were similar demographically, with similar pre-course college grade point averages. The SATS-36 showed increases in affect, cognitive competence, and perceived easiness and decreases in value, interest, and effort from beginning to end of the semester for all sections. Only affect and perceived easiness showed any differences for section, with traditional higher than online on average for both. Results from the SRA questions showed an increase in correct statistical reasoning skills and decrease in misconceptions for all sections over the semester. Traditional students scored higher on average on all three exams, but there were no significant differences between sections on homework, the project, or on university evaluations of the course or instructor. Results are contextualized with prior educational research on course modalities, and proposals for future research are provided.

Classification: D45 U55 K15 C25 C35
Keywords: stochastics; statistics; university teaching; introductory course; statistical literacy; evaluation; educational research; student attitudes; statistical reasoning skills; student performance; achievement; student perceptions; teaching methods; course delivery methods; comparative studies
http://ww2.amstat.org/publications/jse/v23n1/gundlach.pdf