Improving the Experimental Design of SoTL Research

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Improving the Experimental Design of SoTL Research

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Abstract

Limitations in previous pseudo-experimentally designed Scholarship of Teaching and Learning studies were addressed by including recent recommendations in the literature (LoSchiavo, Shatz, & Poling, 2008, Smith, 2008). These involved: (a) pretest/posttest administered in Social Psychology (SP) courses; (b) random assignment of SP students within the same course, semester, and instructor to one of the two interventions; and (c) the recruitment of students from a participant pool to serve as a control group (i.e., completely the same tests without having taken the course). This presentation focused on results from a 50-items SP exam covering SP topics, including prejudice, aggression, attraction and helping behavior. Students’ scores were compared between those randomly assigned to one of two experimental groups (n = 35) vs. a control group (n = 44). Students in the experimental conditions performed significantly better on exam than those in the control; in the control group were reduced (from n = 44 to n = 38), because 4 had already completed a social psychology course and two did not complete the exam.

Materials

Unit 3 Content & Exam 3
- Chapters from Myers, H. (2008) were: Prejudice, aggression, attraction, and helping behavior. 50-item Exam: 45 multiple-choice and 5 true/false items.

Self-referenced Essays (20 items; a.k.a. journal entries)
- Five questions per chapter due once a week (same due date as the quizzes).

Repealed Tests
- 50 items per quiz (see Marsh & Harrington, 2010 for details on the creation of these quizzes).

Discussion & Recommendations

- The current study, along with past research on learning within social psychology courses, has provided stronger evidence that two different learning strategies may be equally effective in this discipline.

- In other words, we are more convinced about the active involvement of students and the repeated assessments (quizzes and journal entries) that will help them retain more information from our classes. This greater confidence is due in large part to the pronounced experimental rigor provided by the addition of a control group and the use of repeated assignment for students enrolled in the same course.

- From this experience, the authors learned that SoTL research offers more flexibility than traditional research designs, in which control elements can be added before, during, or after data are collected and analyzed from one’s course.

Method

Participants
Students enrolled at a mid-sized university in the Midwest participated in one of two experimental conditions during spring 2011 as part of the department’s assessment efforts (n = 35) were recruited from the department’s participant pool in fall 2011 to serve as the control group; those in the control group were reduced (from n = 44 to n = 38), because 4 had already completed a social psychology course and two did not complete the exam.

Control Group
Control Group Experimental Groups (n = 35)
[Participant Pool] (n = 38)
Self-referencing Written Essays (n = 18)
Repeated Testing Quizzes (n = 17)

Women
32 (84%)
26 (74%)

Employed
17 (45%)
23 (77%)

Held previous degree (e.g., AA or AS)
2 (5%)
6 (17%)

Year in school
FR/SO
29 (76%)
1 (3%)

JR/SR
8 (21%)
33 (94%)

Did not answer
1 (3%)
1 (3%)

Note: There was no statistical difference in exam scores between the two experimental groups; therefore they were combined for the analyses with the control group.

Discussion & Recommendations

- The univariate analysis showed that students in the experimental groups (M = 38.37, SD = 4.94) significantly outperformed students in the control group (M = 23.87, SD = 6.57) by an average of 15 points, F(1, 71) = 112.04, p < .001, partial eta squared = .61, and observed power = .100.

Results

- The univariate analysis showed that students in the experimental groups (M = 38.37, SD = 4.94) significantly outperformed students in the control group (M = 23.87, SD = 6.57) by an average of 15 points, F(1, 71) = 112.04, p < .001, partial eta squared = .61, and observed power = .100.

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Recommendaions

The following are a few helpful recommendations for improving the “experimental rigor” of one’s teaching scholarship. The best advice is, certainly, to plan ahead and incorporate “control/comparison condition” before one collects data from the student population. However, Smith’s (2008) and others’ observations imply that the more practical scenario is to plan how to insert these control elements AFTER the research has started. Here are some suggestions:

- Identify which “control/comparison group” options work best for your situation:
  - Baseline
  - Assign control group in the fall, experimental group in the spring, then reverse the pattern the second year.
  - Assign the control and experimental groups to different sections within the same semester.
  - Randomly assign students to two sections of online introductory psychology courses (both inside and outside your department).
  - Use a colleague’s course (which may be a prerequisite for your course) as the comparison group.
  - Randomly assign students (within the same course) to the different conditions.
  - Utilize convenient samples such as those from a participant pool, freshmen level courses (both inside and outside your department).

- The univariate analysis showed that students in the experimental groups (M = 38.37, SD = 4.94) significantly outperformed students in the control group (M = 23.87, SD = 6.57) by an average of 15 points, F(1, 71) = 112.04, p < .001, partial eta squared = .61, and observed power = .100.