

Engaging Activities for Students Who are Learning Research Methods

William J. Lammers

University of Central Arkansas

Along with statistics, students often view research methods as an evil stepsister in the psychology curriculum. Unfortunately, many students who take research methods do not, at least initially, appreciate the beauty of the scientific method as a means to furthering knowledge. Thus, it is incumbent that research methods instructors reveal to students the beauty of science by actively engaging them in the learning process.

Many instructors know firsthand the disinterest and trepidation their students feel when they take a research methods course. Fortunately, many of these instructors also know the benefits of active engagement, have developed activities that engage their students, and have shared their ideas through publications. A variety of handbooks provide a rich source of ideas (Benjamin, 2008; Benjamin, Daniel, & Brewer, 1985; Benjamin & Lowman, 1981; Benjamin, Nodine, Ernst, & Broeker, 1999; Dunn, Smith, & Beins, 2007; Hebl, Brewer, & Benjamin, 2000; Makosky, Sileo, Whittemore, Landry, & Skutley, 1990; Makosky, Whittemore, & Rogers, 1987; Saville, 2008; Ware & Brewer, 1988; 1999; Ware & Johnson, 1996a; 1996b; 1996c; 2000a; 2000b; 2000c; Whittemore, & Rogers, 1987). This chapter focuses on activities described in journal articles that included assessment of effectiveness. It also includes descriptions of a few activities that I have used in my research methods course.

Annotated Bibliography

A Cooperative Learning Approach

Students work in collaborative teams, with five students per team, to conduct three research projects for the course. Each project consists of five phases (research question, research design, data collection, data analysis, and research presentation), with each phase lasting about 1 week. The instructor implements principles of problem-based learning and cooperative learning to facilitate effective teamwork. Students in this course rated the discussion, interest,

and learning higher than those in traditional lecture sections.

- Ball, C. T., & Pelco, L. E. (2006). Teaching research methods to psychology undergraduate students using an active cooperative learning approach. *International Journal of Teaching and Learning in Higher Education*, 17, 147-154.

The Feeling of Deception

Students complete a bogus personality test, receive feedback from the test, rate the quality and usefulness of the test, learn that everyone received the same bogus feedback, and then discuss what it feels like to be the subject of deception. Students reported that they learned about the Barnum effect, as well as the impact that deception may have on research participants. Some students did not enjoy being manipulated by the exercise, but nearly all saw the value and purpose of the exercise.

- Beins, B. (1993). Using the Barnum effect to teach about ethics and deception in research. *Teaching of Psychology*, 20, 33-35. doi:10.1207/s15328023top2001_6.

Measuring Constructs

Students select a psychological construct, develop a conceptual definition, and perform a database search for existing instruments to measure the construct. Then, students select one instrument (and associated publication) that matches their conceptual definition and one that does not. Finally, students make a presentation in which they compare and contrast the two instruments along several dimensions. Pretest and posttest measures showed that students who engaged in the exercise answered more questions correctly on a short survey designed to assess the goals of the activity.

- Brockway, J., & Bryant, F. (1998). You can't judge a measure by its label: Teaching the process of instrumentation. *Teaching of Psychology*, 25, 121-123. doi:10.1207/s15328023top2502_10.

Scale Development

First, the instructor lectures on a psychological construct (e.g., sensation seeking). Students develop two items on a 7-point scale to measure the construct. After the instructor lectures on scale development, students critique the items for clarity, validity, and social desirability. Students revise some items and remove others. Students administer the final scale to research participants, who return 1 week later to complete the scale again, along with a battery of other scales designed to assess convergent and discriminant validity. Students learn how to use SPSS to assess reliability, to assess validity, and to perform the analyses. Students complete the activity by writing a research report in APA format. The authors reported success with this activity over several semesters, including the fact that students generally developed good scales.

- Camac, C., & Camac, M. (1993). A laboratory project in scale design: Teaching reliability and validity. *Teaching of Psychology, 20*, 102-104. doi:10.1207/s15328023top2002_8.

A Four-Stage Content Analysis Research Project

Students use content analysis to study an example of stereotyping in the media by (a) searching the literature to identify a research question; (b) selecting a medium, coding scheme, and unit of analysis; (c) developing a coding sheet and collecting data; and (d) evaluating limitations of external validity and implications of results. Students produce written documents for each stage of the project and produce a poster at the end. Students reported that the project improved their research skills.

- Carpenter, S. (1998). Content analysis project for research novices. *Teaching of Psychology, 25*, 42-44. doi:10.1207/s15328023top2501_13

Becoming Critical Consumers of Research Reported in the Media

Working in small groups, students answer a series of questions regarding a research report in the media, discuss their answers as a class, receive additional information from the actual research article, identify flaws in the media report, generate recommendations for better reporting, and then complete a similar homework assignment in which they compare a media report to the original research article. A short survey showed that students believed the exercise was useful.

- Connor-Greene, P. (1993). From the laboratory to the headlines: Teaching critical evaluation of press reports of research. *Teaching of Psychology, 20*, 167-169. doi:10.1207/s15328023top2003_8.

Collaborative Writing and Peer Review as Aids to Report Writing

Working in pairs, students write a research proposal, receive instructor feedback, conduct the study, write a draft, engage in peer review, and make final revisions. Students also maintain a process journal to describe the work performed by each member of the team. Although 40% of students reported they would rather work alone, most reported that they shared the workload and that the collaboration enhanced their learning.

- Dunn, D. (1996). Collaborative writing in a statistics and research methods course. *Teaching of Psychology, 23*, 38-40. doi:10.1207/s15328023top2301_8.

Writing Letters to Explain Concepts

Students select a research methods concept and write a letter about that topic to another student taking the same course. The letter addresses the concept itself and why the concept is important for the course, for psychology majors, and for the general public. Letter recipients then write a reply letter. Students generally liked the activity, and analysis of the letters showed that most students provided an accurate description and often corrected confusing or incorrect information in the reply letter.

- Dunn, D. (2000). Letter exchanges on statistics and research methods: Writing, responding, and learning. *Teaching of Psychology, 27*, 128-130.

Validity and Interviewing

Students begin by critiquing a mock interview based on principles provided by the instructor. Then, working in small groups, they develop a set of interview questions to measure a personality trait. Students then test their questions by conducting a pilot interview on a student from another group. Students discuss and edit their questions. Before the next class, each student interviews a participant with the set of questions and administers an established scale to measure the same personality traits. Students discuss and analyze measures of convergent validity. This activity resulted in positive student evaluations and higher test scores on items related to the activity content.

- Friesen, M., & Ellis, B. (2008). Convergent validation of an interview-based personality assessment: A laboratory project. *Teaching of Psychology, 35*, 109-112. doi:10.1080/00986280802004552.

Revealing Experimenter Bias

The instructor informs students about participant bias, tells them that alcohol will decrease performance on a mirror-tracing task, and has a

confederate perform the task after consuming different amounts of a supposed alcoholic drink. Students rate the confederate's speech and task performance. Although the confederate exhibits stable levels of performance, students rated that the confederate's speech and task performance decreased with increasing levels of alcohol. The class then discusses the issue of experimenter bias. Students reported that the activity was an effective demonstration of observer bias.

- Goldstein, M. D. (1994). "The eye of the beholder": A classroom demonstration of observer bias. *Teaching of Psychology*, 21, 154-157. doi:10.1207/s15328023top2103_5.

Comparing a Media Report to the Actual Journal Article

Students read a media report (selected by the instructor), answer a set of worksheet questions, read a journal article that served as the source of the media report, answer a set of worksheet questions, answer additional worksheet questions that compare the two reports, discuss their worksheet answers in small groups, and engage in discussion with the instructor regarding the limitations of media reports. Students who engaged in this activity were better able to answer questions about the issue than students who did not.

- Hall, S., & Seery, B. (2006). Behind the facts: Helping students evaluate media reports of psychological research. *Teaching of Psychology*, 33, 101-104. doi:10.1207/s15328023top3302_4.

Solving Riddles to Learn About the Scientific Approach

The instructor poses a riddle to students, who then ask the instructor a series of yes/no questions to solve the riddle. Students then work in small groups on a series of riddles, with one member of each group serving as the person with the answer who responds to the yes/no questions. Finally, the class discusses the principles of the scientific approach learned by the activity, including influence of perspective, the danger of assumptions, posing good questions, importance of contradictory information, persistence, simplicity, and excitement. Students reported that the activity was interesting, useful, and the instructor should use it in the future.

- Hatcher, J. W., Jr. (1990). Using riddles to introduce the process and experience of scientific thinking. *Teaching of Psychology*, 17, 123-124. doi:10.1207/s15328023top1702_14.

Making Ethical Decisions Regarding the Use of Animals in Research

Students role-play being a member of an animal care and use committee and work in small groups to make yes/no decisions regarding animal research proposals based on actual situations. After learning about different philosophical positions regarding the use of animals in research, students read research proposals and work to reach consensus regarding the ethics of the proposal. Each of the four proposals addresses slightly different issues. Nearly every student recommended that the instructor use the activity in the future.

- Herzog, H. A. (1990). Discussing animal rights and animal research in the classroom. *Teaching of Psychology*, 17, 90-94.

Observations in the Cafeteria

This activity describes how students can perform naturalistic observation, correlational research, and experimental research with patrons of a campus dining facility. For naturalistic observation, students choose a variable to observe, provide an operational definition, and perform descriptive statistics. For correlational research, students select two quantifiable variables to observe (with some suggestions from the instructor) and create a scatterplot. For experimental research, students select an environmental variable to manipulate and record behavior. The activities provide opportunities to discuss various aspects of research methods, including the advantages and disadvantages of different methods. Evaluation showed higher test scores and more positive feedback from a class that performed the activities than from a class that did not.

- Koschmann, N., & Wesp, R. (2001). Using a dining facility as an introductory psychology research laboratory. *Teaching of Psychology*, 28, 105-107. doi:10.1207/S15328023TOP2802_07.

Gender Differences in Smiling

Students bring a yearbook to class, and the instructor informs them to begin with the assumption (null hypothesis) that there is no difference in the frequency with which young men and women smile. Students decide on the alternative hypothesis, discuss possible operational definitions of smiling, collect data, and write a conclusion. Students discuss the importance of operational definitions, interpretation of results, external validity, and other concepts. Students reported that the activity was effective, fun, and useful for future classes.

- Lipsitz, A. (2000). Research methods with a smile: A gender difference exercise that teaches methodology. *Teaching of Psychology*, 27, 111-113. doi:10.1207/S15328023TOP2702_07.

Wording of Survey Questions

Students collect data for two surveys that only differ in the wording of the questions; compare mean participant responses; and discuss issues such as implicit assumptions, ambiguity of terms, validity, and interpretability. A pretest-posttest assessment showed that students were better able to identify and correct poorly worded scale items.

- Madson, L. (2005). Demonstrating the importance of question wording on surveys. *Teaching of Psychology*, 32, 40-43. doi:10.1207/s15328023top3201_9.

A Hands-On Touch Perception Experiment

Using cookie-cutters, students perform a replication of a touch experiment that compares perception with active touch versus passive touch. In the active touch condition, participants have 2 s to move their fingers on the shape, whereas in the passive touch condition, they simply sense the shape pressed into the palm of their hand. Working in small groups, students serve as experimenters and participants to collect data, analyze data, discuss extraneous variables, and assess possible improvements to the procedure. Students then implement their new procedure, research additional literature and write a research report. Students reported that this study was their favorite of the semester, and faculty reviewers judged their research papers better for this study than others performed during the semester.

- O'Dell, C., & Hoyert, M. (2002). Active and passive touch: A research methodology project. *Teaching of Psychology*, 29, 292-294. doi:10.1207/S15328023TOP2904_07.

Graphs Prevent Gaffes

Students work with four bivariate data sets that result in the same Pearson r value. However, two data sets include outliers, and one data set represents a curvilinear relation. Students calculate the Pearson r correlation coefficient for each data set and produce a scatterplot for each data set. Then for each data set, they write a paragraph that reports the r values, a paragraph that describes the relation between variables, a paragraph that describes the appropriateness of using the Pearson r , and a paragraph that describes what they learned from the activity. A review of the student paragraphs showed that most students responded correctly, and most

correctly described the issues involved with outliers and nonlinear relations.

- Peden, B. (2001). Correlational analysis and interpretation: Graphs prevent gaffes. *Teaching of Psychology*, 28, 129-131. doi:10.1207/S15328023TOP2802_14.

Designing a Survey for Graduating Majors

Students learn about survey research, work collaboratively to develop items for an exit survey of the undergraduate psychology majors, refine the items, develop a consent form, collect data, analyze data, and work individually to write an APA-format research report. In a follow-up questionnaire, students reported that the project helped them learn a variety of concepts and increased their interest in conducting research.

- Sattler, D. N., Back, S., & Pollitt, H. (1995). An exit survey project for a social psychology laboratory. *Teaching of Psychology*, 22, 238-240. doi:10.1207/s15328023top2204_6.

Understanding APA Style

This article describes an out-of-class activity where students use the APA Publication Manual to detect a variety of style errors in a poorly constructed manuscript. Students who completed the activity scored higher on an APA-style posttest and provided positive self-report ratings of the activity's effectiveness. Scores on the activity were positively correlated with grade on a subsequent research report.

- Smith, G., & Eggleston, T. (2001). Comprehending APA style through manuscript analysis. *Teaching of Psychology*, 28, 108-110. doi:10.1207/S15328023TOP2802_08.

Predicting Test Performance

Students in small groups design a survey with five questions (predictor variables) designed to predict performance on an exam. Questions from all groups form a questionnaire given to all students. The instructor analyzes the data and provides a detailed regression report to students. Each group then makes a summary presentation to the class regarding the quality of their items. The instructor provides extra credit points based on the predictive power of the five items. Students reported that the activity was effective in demonstrating the challenges of generating a survey and in the concepts of regression analysis.

- Timmerman, T. (2000). Survey design and multiple regression: Frequently encountered, but infrequently covered. *Teaching of Psychology*, 27, 201-203. doi:10.1207/S15328023TOP2703_08.

Activity to Demonstrate Regression to the Mean in Therapeutic Treatment

Students self-report their mood and recent food consumption, undergo an obviously ridiculous treatment (e.g., touching an elbow and repeating a mantra), wait several days, and again self-report their mood and recent food consumption. The instructor collects the data, selects the top 10% and bottom 10% pretreatment scores, pairs those scores with the posttreatment scores for the same students, and creates a line graph depicting the means before and after treatment. Students discuss explanations for the absurd effect of the treatment and, after evaluating several possible extraneous variables, realize the regression to the mean explanation. Students reported that the activity was enjoyable and useful.

- Viken, R. J. (1992). Therapy evaluation: Using an absurd pseudotreatment to demonstrate research issues. *Teaching of Psychology, 19*, 108-110.

Testing Astrological Claims

Students determine their astrological sign, describe astrological assumptions about human behavior, learn about the scientific method, work in small groups to generate a hypothesis based on an assumption, share their hypotheses with the class, and then test the hypothesis that particular zodiac signs are associated with particular personality traits. Students then select a set of personality traits that best describe themselves. The instructor collects the data, analyzes the data, and discusses how statistics provide a conclusion. Students reported that the activity was valuable.

- Ward, R., & Grasha, A. (1986). Using astrology to teach research methods to introductory psychology students. *Teaching of Psychology, 13*, 143-145. doi:10.1207/s15328023top1303_11

A Script Activity to Learn the Steps of Research

Students learn about scripts, develop a list of actions to complete a research project, work in small groups to compare their scripts, share their lists with the class, and develop a composite script. Initially, students receive the first (get project idea) and last (publish research) items of the script and then list, in sequential order, about 20 actions necessary to progress from the first to the last item. Students subsequently get into small groups and compare their scripts. All students report their items to the class in an effort to create a composite script that is then compared to a script developed by actual researchers. Student surveys and reports suggested that the activity was effective.

- Wilson, T., & Hershey, D. (1996). The research methods script. *Teaching of Psychology, 23*, 97-99. doi:10.1207/s15328023top2302_5.

Observing Behaviors in a Television Program to Learn Techniques of Observation

After listening to a lecture about time sampling, event sampling, and trait rating techniques of observation, students work in small groups to develop a method for using one of the three techniques to observe certain behaviors in a predetermined television show. After making observations, students calculate interrater reliability for their technique. Students discuss the pros and cons of their technique, compare reliability measures across the different techniques, and discuss the advantages and disadvantages of the three techniques. Students believed the activity was effective and recommended it for future use.

- Zeren, A., & Makosky, V. (1986). Teaching observational methods: Time sampling, event sampling, and trait rating techniques. *Teaching of Psychology, 13*, 80-82. doi:10.1207/s15328023top1302_8.

Additional Ideas for Engaging the Student

I now include several activities from the instructor's manual that Pete Badia and I coauthored a few years ago for our textbook *Fundamentals of Behavioral Research* (Lammers & Badia, 2004).

Reliability of Observations of the Instructor

At the beginning of a class period, tell students that they will observe and record a particular behavior exhibited by you (the instructor) during the course of the class period. They can either record the occurrence or nonoccurrence of the behavior during specified time intervals (e.g., 10-min periods) or they can keep a running total of the number of times that the behavior occurred during the entire class period. Tell them that they will select a particular behavior and that you will not know the behavior selected. They should select a behavior that is likely to occur several times during the class period (e.g., saying a particular word, making a particular hand gesture, walking to a particular location at the front of the room). After deciding on the method of observation (time intervals or total number), leave the room for 2 min and ask the students to agree on the behavior to be observed and then begin recording when you return to the room. At this point, continue with the topic for the day.

You can either discuss this activity at the end of the class period or the beginning of the next class period. Select two observers who did not sit next to each other to share their recorded observations with the class. Ask the students why you did not select two students who sat next to each other and emphasize the importance of independence of observations. Calculate a measure of interobserver reliability (the particular method will depend on the method used to make observations). Discuss why the reliability was high, moderate, or low. Discuss challenges the students encountered during the observation period. Discuss why it was important for you not to know the behavior that students observed.

Sources of Extraneous Variability

Most textbooks list at least a dozen possible sources of extraneous variability in an experiment, organized into one of three categories – sources due to participants, sources due to experimenters, and sources due to method. One of the best ways to understand these design flaws is to design hypothetical experiments that include these flaws. Students should work in small groups, and the instructor should assign each group two sources of extraneous variability. For each source, the groups should develop a hypothetical experiment in which the source of extraneous variability is a significant design flaw. Depending on class size, all or some of the groups should present their hypothetical experiments to the class. Students then determine which design flaw (i.e., which extraneous variable) is exhibited in each experiment. (Another option is to assign secretly two sources to each group. The groups then write their hypothetical experiments on a piece of paper, after which they exchange pieces of paper and attempt to determine which source of extraneous variability is the flaw in each study.)

Concluding Statement

Research Methods is a challenging course to teach. Many students perceive the terminology as difficult, do not foresee a future in which they will engage in research, and are relatively unaware of the everyday situations in which they are consumers of behavioral research. But what student does not like to go on a treasure hunt? The treasure is the discovery of principles that describe and explain human behavior and thought; there can be no better treasure for a psychologist. To reach the treasure, behavioral scientists must search for and uncover the clues that lead to the hidden treasure. The clues are created by the research they perform. Useful clues are those that lead further down the correct path. Researchers will uncover useful clues only if they ask good questions,

design sound studies, properly analyze their observations, and critically interpret their results. Teachers need to engage students in the treasure hunt. Students should practice the skills that provide the clues and actually experience the excitement of finding a clue. It is nice to read a story about a treasure hunt, but it is so much more fun to participate in one!

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