



# INNOVATION ABSTRACTS

December 6, 2018 ♦ Vol. XL, No. 40

## Increasing Research Knowledge Through a Simple Research Activity

In the behavioral sciences, research methodologies are covered in almost every course. Still, students continue to struggle with the application and understanding of terminology related to research; being able to explain the importance of independent variables, dependent variables, or construct validity to random sampling or random assignment seems to cause confusion. We know that hands-on learning is the best strategy to help increase students' understanding and engagement with material. Sending students off with a guiding worksheet and a container of bubbles (the kind that children play with that come with wands and can be purchased at toy or discount stores) has proven to be a simple research activity that has increased their understanding of research terminology and engagement in other course activities.

In preparation for this research activity, students should have read assigned course material covering research methods. In class, a brief overview of the different types of research methods, the benefits and concerns of each method, and the difference between correlational and experimental research is offered to provide a more in-depth focus on terminology and methodology related to experiments. Students are then given an opportunity to participate in a mini research activity before engaging with published research by reading through research articles from scholarly journals.

While I have tried various mini research activities under this lesson plan, the one that seems to have had the greatest success (both in terms of engagement and increased grades) involves a simple container of bubbles. The mini research activity asks students to select an area of interest, develop a study beneath it, and create a procedure for testing the study's hypothesis, all of which are open to them to decide. Students are also given creative liberty with how they will use their container of bubbles in their study. Students are allowed to work in groups of up to four people or participate in the lesson as an individual. They must take a picture of the accompanying mini research activity worksheet and submit the photo at the end of class, but may turn in their completed worksheet during the following class. Students who do not have a means to take a picture of their progress and email it may have the worksheet signed by someone in the building's office. This ensures that students complete their work during the activity, but still have time to edit the study worksheet

prior to it being graded. Groups may turn in one group worksheet or individual worksheets for each group member.

The mini research worksheet given to students is designed to offer practical experience across a variety of research fields as well as to crystallize their understanding of several important research terms. The worksheet first instructs students to develop a hypothesis to guide their selected study. This offers students practice in formulating a hypothesis, while the process of testing it offers a basic understanding of why a hypothesis must be specific and testable. Students must also identify the independent and dependent variables for their study. Identifying variables is a particular area of difficulty for many students. However, the process of referring back to the hypothesis and evaluating what to manipulate and what to measure in order to test it seems to make an understanding of variables more clear. Students also need to identify the type of research they are conducting. Students often refer to any type of study as an "experiment," but generating a short description of their research process forces students to assess the different types of research methodologies and categorize their study based on study-specific criteria.

Since students have creative liberty in formulating their mini research activities, it is interesting to see the variety of hypotheses and studies they develop. Those with an interest in psychology will generally develop a study involving people. For example, students may design a study that incorporates the container of bubbles by testing whether people will smile upon seeing bubbles being blown, counting the people who pop the bubbles, taking note of gender differences in those who interact with the bubbles, or developing some other sort of bubble-interactive study. Students with an interest in science often design studies that address the height of bubbles in different environments, test what happens when substances (such as syrup) are added to the bubble mixture, or assess whether temperature affects how far a bubble floats off. Again, as long as students have correctly formulated a hypothesis, identified the variables, evaluated the type of research their study falls beneath, and have listed details of the study, the actual type of study and procedure is of their choosing.

Of course, students also report on their study results. Depending on the type of research they engage in, results are qualitative or quantitative. Some students produce charts and graphs, while others submit narratives of what they observed. Students also analyze their results and explain if and why they are important, and how they relate to the hypothesis. Finally, students report on what they learned about the research process and what they would do

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differently if they were to do the study again. These answers range from “Paper towels would be a useful tool to have on hand” to “Using what we learned and gathered from this experiment, we are able to apply it to future studies and continue to improve upon our skills from there.” While levels of critical thinking vary, students are critically analyzing the research process and demonstrating learning.

Once students’ worksheets are finalized, the class participates in the peer review process. During peer review, students are very excited about the variety of ideas and tend to notice similarities between studies. They frequently discuss comparable processes and problems and how both were handled by respective “researchers.” Moreover, students are exposed to an array of studies, allowing for development of a greater understanding of hypotheses, variables, and types of research. Students also have suggestions for limitations and confounding variables that the original researchers may have missed.

Student engagement and evidence of new awareness during and after the peer review process is truly phenomenal. Students quickly realize the activity is not about the bubbles, but about the research process. After the mini research activity, students have stronger comprehension of how difficult research is, how many variables are involved in scientific studies, a better appreciation of scholarly research, and they become excited as they realize that they can participate in the research process. The mini research activity leaves students with the understanding that someone does not need to be a graduate student to conduct research.

Since implementing this mini research activity into my lesson plan for teaching research strategies, my students’ understanding of research terminology has increased. The average class test grade in research terminology went from 70.48% to 77.27%. Similarly, when students move on to look at research articles from scholarly journals, they have a greater comprehension of research methodology and are able to analyze strengths and limitations of published studies. Average class grades in research methodology went from 80.3% to 85% after implementing this activity. Additionally, students are more engaged in the class and less intimidated by research.

Empowering student researchers with a container of bubbles, a worksheet, and encouragement that they can conduct scientific study has made a noticeable difference in my students’ understanding of research. They are engaged in the bubble-based mini research activity and develop transferrable knowledge that carries over into other course concepts and content.

**Regina Roof-Ray**, *Assistant Professor, Psychology*

For further information, contact the author at Harford Community College, 401 Thomas Run Rd., Bel Air, MD 21015. Email: RRoofRay@harford.edu