

General Psychology Laboratories

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Psychology as a natural science was born in the laboratory, and the laboratory is the core of its being. Although William James (1892) wrote a plea for psychology as a natural science, it was through college and university laboratories at the turn of the 20th century that psychology established itself as a natural science (Benjamin, 2000). In 1903, Titchener wrote, “psychological instruction centers in the laboratory” as it does “in elementary physics or elementary zoology” (p. 175). By the 1920s, Kline and Kline (1927) asserted, “this position... will readily be admitted by all psychologists” (p. vii), Foster (1923) had developed a course with 90 hours allotted for laboratory work, and the psychological laboratory was on the rise in America (Fuchs & Milar, 2003).

As we enter the 21st century, however, the laboratory holds a small place in the psychology curriculum. A psychology major typically garners little laboratory experience (Perlman & McCann, 1999), and an analysis of 500 introductory courses across the United States (Perlman & McCann, 1999) revealed that only 5% of these courses included a laboratory component. In response, there have been urgent calls for faculty to teach the scientific method (McGovern & Reich, 1996; Miller, 1992; Sternberg, 1999); and Berthold, Hakala, and Goff (2003) argued that the laboratory, considered integral to the discipline, should once again become the norm, not the exception.

For over 30 years, the College of St. Catherine and St. Olaf College have had laboratories in their psychology curricula. This report describes our parallel efforts to develop investigative laboratories beginning at the introductory level.

The College of St. Catherine Experience

St. Catherine, which has included a hands-on laboratory component in General Psychology since the 1970s, set out in 2001, with the help of a National Science Foundation (NSF) grant, to move away from canned studies and extend the scope of its offerings. We moved from providing a taste of psychological research to offering opportunities for direct scientific inquiry, expanding laboratories to a full semester and including greater depth and breadth of coverage.

The purpose of the General Psychology laboratory at St. Catherine is to enhance learning by affording opportunities for scientific inquiry, providing students with firsthand experience of

different research methods, and helping students develop their research skills. Students meet with their lab group (12-16 students) and lab instructor once each week for an hour. Lab instructors, who are paid and typically serve for two semesters, are upper-division psychology majors or minors.

The current version of the lab experience includes five discrete labs and is the result of highly collaborative work by all faculty members in the department. Each of the labs focuses on a different component or type of research method: (a) literature review, (b) observation, (c) experiment, (d) correlational research, or (e) archival research. In addition, each lab is tied to class lectures and to specific assigned readings from “Forty Studies that Changed Psychology” (Hock, 2002). For example, students conduct a structured observation of children’s exploratory behavior in lab, cover developmental psychology in class, and read about a study by Piaget.

Lab 1 is a literature review based on a student-chosen topic related to gender or culture. Students learn how to use PsycINFO and work with lab partners to conduct literature searches.

Lab 2 is a structured observation based on developmental psychology, specifically children’s curiosity. Students observe a videotape of six different children playing individually with Banta’s Curiosity Box. They learn how to gather and record observational data, distinguish observations from inferences, and analyze the data.

Lab 3 is an experiment on memory. Students design an experiment using software developed at St. Catherine and conduct their experiment with students from other lab sections. They learn how to design an experiment, analyze data, and draw conclusions about phenomena such as the serial position effect, false memory, and isolation effects in free recall.

Lab 4 uses the correlational method and examines the relationships between stress, personality, and health. Students use computer software to gather heart rate data under baseline and “mild stressor” conditions. They also complete surveys about life stress and personality type. Students learn to collect physiological data and calculate statistics using Minitab.

Lab 5 uses the archival method and is based on social psychology, specifically the relation between attitudes/beliefs and behaviors. St. Catherine has administered the College Institutional Research Program survey to first-year students since 1971. Data from these surveys are saved on lab computers; and students generate hypotheses, conduct a literature search on PsycINFO, select items from the survey, and test their hypotheses.

As part of the lab experience, each student is required to write five lab reports in APA style. To assist in writing these reports, students purchase a 90-page lab manual that contains handouts and instructions, as well as supporting materials (e.g., APA guidelines for writing lab reports, a guide to PsycINFO, sample lab reports). Based on our early experiences, we learned that writing full reports for every lab was cumbersome and, at times, overwhelming for students. Thus, the first four reports are partial reports, and the fifth is a full report. The

course instructor provides feedback and grades the first and last reports; lab instructors assess the remaining reports.

Comprehensive evaluations are conducted each semester. Surveys are used to evaluate students' comfort level, experience, and interest in several content and skill areas targeted by the labs. Surveys are also used to evaluate each of the specific labs and the lab instructors. In addition, students initially complete pre-tests and later post-tests, as part of their final exam, to measure their knowledge of lab related concepts.

The St. Olaf College Experience

St. Olaf College has long included laboratory and research instruction for its psychology majors, but it did not offer laboratory courses in General Psychology until 1994-95. At that time, a college-wide curricular change resulted in the Department of Psychology being included among those offering introductory courses as core courses in the natural sciences. To meet this challenge, the department obtained an NSF grant and developed laboratory spaces, renovating and strengthening them for use in research.

In 1997-98, with the receipt of another NSF grant, the department extended its goals and included investigative laboratory experiences for introductory students. With renovated spaces and curricular opportunities, students were able to see the possibilities and practices of each research space, work with the researchers and faculty, and participate in investigative work. The goals were to foster inquiry; encourage students to work together in the library, laboratory, and field; and encourage students interested in college or secondary school teaching to teach psychology as an investigative science.

To achieve these goals, the St. Olaf faculty developed small investigative laboratory sections in which students learn how to propose hypotheses; use protocols for gathering data; collect, analyze, and interpret these data; and report their results orally and in written form. Students work together in groups of three, sharing their data and interpretations, and then present their findings to the other students in their laboratory section. Therefore, students in these courses have, from the outset, an understanding of psychology grounded in scientific activity, rather than derived through the consumption of predigested ideas. These courses thus avoid what Whitehead (1967) termed the blight of "inert ideas," and they help students develop a more rigorous and critical frame of reference that they can use when they encounter claims made about psychology in the larger culture.

The St. Olaf faculty members encourage students interested in teaching to serve as preceptors for the course. Preceptors are students "who earn credit by learning course material while assisting faculty members" (The 1994-1995 St. Olaf College Catalog, 1994, p. 6). The preceptors for General Psychology teach with faculty in the laboratory; help other students formulate testable research questions; and advise on observation, experimentation, ethics in research, data analysis, and presentation format. In addition, preceptors attend lectures, read the assigned material, and assist with constructing and grading examinations.

It is a common dictum that the best way to learn is to teach. Psychology preceptors gain experience from teaching with a college professor and report being better prepared to instruct their own students. They become well grounded in the discipline of psychology, especially in designing and conducting research. Thus, the inclusion of preceptors interested in teaching is likely to improve the teaching of psychology at the secondary, college, and university levels.

These laboratories also encourage students to work together as a community of learners. This collaborative-learning model extends from small research groups of three students to laboratory sections of 15 students, and to a classroom of 60 or 120 students. Collaborative learning also continues in an integrated course component on information literacy and fluency. Under the direction of a reference librarian, students learn a logical sequence of doing research in the library, focusing on the investigative questions they ask. Finally, collaborative learning is used in a field project in which groups of students make behavioral observations as part of a larger class research study.

The introductory laboratories reflect the specific interests of the St. Olaf psychology faculty. Each investigative laboratory is designed around a prominent psychological question that students may approach from a variety of standpoints (e.g., What might eye blinks reveal about attention? How can noise be beneficial? Can a subjective illusion be measured?).

Students working in small groups discuss the question and, with the support of their professor and preceptor, devise testable hypotheses and design and carry out the study. Finally, they prepare a full APA-style report. Students complete the Discussion section of each report in the week following the investigative laboratory experience. This section has two parts: a discussion of the findings and a discussion of the process. In the discussion of process, students reflect on the outcomes they obtained and extend their thinking from the laboratory to the outside world; in essence, they report on the meaning or significance of their results. Finally, students reflect on the process of investigation—the value of teamwork, sharing ideas, insightful observations, difficulties encountered, and what they learned from the research process.

Concluding Note

The goal of this paper was to inform readers that the introductory course, largely populated by first- and second-year students, can include a substantial laboratory component and that it can take on different forms. The introductory laboratories at the College of St. Catherine and St. Olaf College stand as illustrations and do not exhaust the possibilities. In both cases, the way in which each department includes a laboratory in General Psychology is a matter of the history, experiences, and realities of each institution. We would advise our colleagues at other institutions who are contemplating a move to introductory labs to keep this in mind.

Most important, we think, is that students of psychology fully and completely understand that the laboratory and psychology are closely intertwined and, in fact, “[i]t is the establishment of the laboratory that marks the transition of psychology from philosophy to science” (Benjamin, 2000, p. 318). Furthermore, it is essential that students’ time in the laboratory is not simply a matter of demonstration projects but rather that “every student should be presented an

opportunity to understand what science is, and is not, and to be involved in some way in scientific inquiry, not just a ‘hands-on’ experience” (NSF Advisory Committee, 1996, p. 2).

As a final note, we have both short-term and long-term objectives. In the short-term, we hope that our experiences will help others make the case for a General Psychology laboratory at their own institutions. In the long-term, we hope that undergraduate students will be no more puzzled by a laboratory in General Psychology than they would be by a laboratory in General Biology, Physics, or Chemistry.

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