

Educational Goals Related to the Research Experience

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Since the formation of psychology in the late 1800s, students have gained knowledge of psychology by participating in research experiences. In fact, in the earliest days of psychology, students learned about psychology by replicating “classic” experiments and, subsequently, by conducting new experiments (Goodwin, 2003). Although the growth of applied psychology in the past few decades has likely led to an overall decline in the number of students who pursue research-oriented careers, research experiences have nevertheless continued to play a vital role in the education of undergraduate students, providing them with a hands-on way of learning more about psychology. In fact, several influential reports have suggested that participating in research can be one of the most important components of the psychology major’s undergraduate experience. Below we briefly discuss two of these reports.

The Quality Principles

St. Mary’s College of Maryland played host in 1991 to the American Psychological Association’s (APA) National Conference on Enhancing the Quality of Undergraduate Education in Psychology (also known as the St. Mary’s conference). The goals of the conference were to “discuss critical questions for undergraduate educators” and “to synthesize the scholarship and practice of the teaching and learning of psychology” (McGovern, 1993, p. vii). From this gathering came the *Quality Principles*, “a concise blueprint for innovation and change in undergraduate education” (McGovern & Reich, 1996, p. 252). Recommendations contained in the *Quality Principles* identified knowledge of research methods, the ability to think scientifically, and research experience as important goals of undergraduate education.

APA’s Undergraduate Psychology Major Learning Goals and Outcomes

Approximately a decade after the St. Mary’s conference, the APA’s Task Force on Undergraduate Psychology Major Competencies identified 10 goals

that psychology departments should strive to achieve (Halonon et al., 2002). The task force divided these goals into two general categories: “Knowledge, skills, and values consistent with the science and application of psychology” (e.g., understanding research methods, critical thinking) and “Knowledge, skills and values consistent with liberal arts education that are further developed in psychology” (p. 3) (e.g., communication skills, professional development). The task force subsequently outlined various subgoals, many of which entailed learning about psychology as a science.

Undergraduate Research Experience: Primary Educational Goals

Clearly, teaching students “to think as scientists about behavior” (Brewer et al., 1993, p. 169) is an important goal of undergraduate education in psychology. Although undergraduate research experiences may not achieve all of the goals highlighted in the *Quality Principles* or in APA’s learning goals and outcomes, we believe that such experiences can help achieve five primary goals: (a) knowledge of research methods, (b) the ability to think critically, (c) acquiring the values of a psychologist, (d) the ability to communicate effectively, and (e) personal and professional development. Below we discuss how research experiences help students achieve these goals and provide some evidence in support of these assertions.

Knowledge of Research Methods

Regardless of whether students intend to pursue graduate education or seek employment, knowledge of research methods, and the technical and analytical skills that accompany this knowledge, will likely enhance their chances of achieving these goals (e.g., Briihl, 2001; Keith-Spiegel, Tabachnick, & Spiegel, 1994). Although students receive exposure to research methods in some of their courses, the opportunity to acquire hands-on experience will serve further to solidify their understanding of research methods.

Baker and Serdikoff (2006) found that students who participated in undergraduate research felt they knew more about research methods and had a greater appreciation of psychology as a science than students who did not have such experiences (see also Seymour, Hunter, Laursen, & Deantoni, 2004). Similarly, students in other disciplines who take part in research experiences believe their research skills improve as a function of their experiences; they also possess more knowledge of the research process, as measured by faculty reports (Kardash, 2000).

Critical Thinking

Although learning course content is an important part of undergraduate education, teaching students to think critically about the information they encounter is arguably even more important. Whereas students will always have access to information about psychology (e.g., in books, on the Internet), they will need the skills to discern what information is accurate.

Again, undergraduates who participate in research tend to show gains in critical thinking, as well as improved “understanding [of] how to approach research problems” (Seymour et al., 2004, p. 498). These students also show better knowledge of how researchers answer scientific questions (Ryder, Leach, & Driver, 1999). Furthermore, the analytical skills that students often acquire while participating in research experiences may help them think critically about the information they encounter on television or on the Internet, for example, much of which is portrayed inaccurately (Saville, 2008).

Values of Psychology

Obtaining a degree in psychology typically means that students come to know more than just course content—it means that they learn about, and hopefully acquire, a set of values that characterizes most psychologists: the ability to “weigh evidence, tolerate ambiguity, act ethically, and reflect other values that are the underpinnings of psychology as a science” (Halonen et al., 2002, p. 14). Although students are frequently exposed to these ideas in their classes, the ideas often come to life when students have the opportunity to conduct psychological research. For example, although students may be familiar with APA’s (2002) ethical guidelines before they participate in research experiences, assisting with data collection requires them to behave in accordance with these guidelines. Similarly, although students may know that tolerating ambiguity is important, this idea may become more salient when students analyze

a set of data—especially if the data seem to contradict some previously held belief.

Students with undergraduate research experience are more likely to self-report the ability to “think like a scientist” and “appreciate scientific psychology” (Baker & Serdikoff, 2006). They also report more positive attitudes toward learning and research, and a deepened understanding of how the sciences are connected (Seymour et al., 2004).

Communication

As many will attest, students are not fond of writing APA-style papers. “This isn’t an English class, you know,” some will object. Yet, as Sternberg (2004) pointed out, effectively communicating one’s ideas is a vital part of the research process. Although researchers may have the best ideas in the world, only if they are able to communicate those ideas clearly will they have the opportunity to impact others (e.g., Bem, 2002; Silvia, 2007). Moreover, effective communication is likely to be an important skill regardless of which career paths students choose to follow. Thus, participating in research experiences—especially those that lead to conference presentations or publications—will give students the opportunity to learn how to communicate their ideas in a clear and concise manner.

Participating in undergraduate research often results in an improved ability to collaborate with others (Mabrouk & Peters, 2000) and improved writing and presentation skills (Bauer & Bennett, 2003; Kardash, 2000). In addition, Seymour et al. (2004) found that students from four different liberal arts colleges in a number of different disciplines (e.g., biology, mathematics, computer science, psychology) reported an improved ability to present and explain their work, make oral arguments, and comprehend scientific literature after conducting their own research.

Personal & Professional Development

Finally, research experience gives students an opportunity to focus on personal and professional development. For instance, although many students become psychology majors with hopes of becoming clinicians, counselors, and the like (Saville, 2008), many are unaware of the specific duties that each of these entails. Research experience, whether basic or applied in nature, provides undergraduates an opportunity to learn more about some of the different areas of psychology and identify which area(s) appeals most to them. Identifying which areas of psychology interest them is especially likely when

students have the opportunity to work with several faculty members on different types of research projects or continue with one research group for an extended period of time (Seymour et al., 2004).

Not only do students who participate in research report improved confidence and self-esteem (Alexander et al., 1998; Seymour et al., 2004), but they are also more likely to present their research at conferences and co-author a publication, both of which increase their chances of gaining admission to graduate school (Carmody, 1998; Keith-Spiegel et al., 1994; Landrum, Davis, & Landrum, 2000). In fact, students who participate in research are more than twice as likely to be admitted into doctoral programs (Bauer & Bennett, 2003).

Suggestions for Enhancing the Undergraduate Research Experience

In the preceding sections, we discussed five outcomes that likely result when students participate in undergraduate research. In the sections that follow, we provide additional tips for enhancing students' undergraduate research experiences.

Get Students Involved Early

One way of increasing the likelihood that students will achieve the aforementioned goals is to get them involved early (e.g., Ishiyama, 2002). There are several ways to accomplish this. Ask your colleagues to announce research opportunities in their introductory courses. Talk to underclassmen in your department, tell them about your ongoing research projects, and explain to them why research experience is important. You might also have seniors who participated in research experiences talk to your students. Most importantly, give novice students the opportunity to join your research group. Although this means that you will have inexperienced students who might require more mentoring, you may also have the opportunity to grow professionally from these interactions.

Take Students to Conferences

In our experience, it is very rewarding to watch students attend their first professional conference. Meeting the "big names" in our field can have a huge impact on students' professional development. Similarly, having students present their research can also be a great experience. However, as you well know, attending conferences can also be expensive. Thus, it is important to search for funding available for undergraduate projects. For example, the

National Conference on Undergraduate Research (NCUR) provides funding to students who will be presenting their research at professional conferences; Psi Chi (<http://psichi.org/awards>), APA (<http://www.apa.org/ppo/funding/atoz.html>), and APS (<http://psychologicalscience.org/apssc/undergrad/>) also have such funds available. Your own institution may even set aside funds for students attending conferences. Encourage your students to apply for these funds.

Form a Research Group

By participating in collaborative endeavors, students and faculty both reap a number of rewards (Davis, 1999). For students, these may include gaining research experience, presenting their work at conferences, and maybe even publishing a paper. Similarly, faculty receive a number of rewards as well. For example, in addition to the increased productivity that often results from having a number of students working together on several different projects, faculty get watch their students develop professionally, "perhaps the richest reward" (Davis, 1999, p. 202).

In our research groups, we include lower-level students who may be new to the group and who want to gain research experience and upper-level students who may be completing honors theses or helping with more advanced projects. Ideally, each research project includes students at all levels. In this way, the faculty member serves as more of a facilitator, and the experienced undergraduates direct the projects. Most often, students in our research groups conduct the studies on their own time; our large research meetings then become a forum for status reports, feedback, and brainstorming. Although such a set-up may take some time before it runs smoothly, it ultimately can be very productive and rewarding.

Ask Students to Help with Manuscripts

Most psychology teachers consider writing to be a very important skill for students. However, many undergraduates do not get considerable practice, as it is often labor-intensive for teachers to give extensive feedback on a larger number of papers (Boice, 1990; Goddard, 2003). Thus, allowing students to be involved in your own writing projects can be beneficial to you and your students. Students can start by writing smaller sections of a manuscript or by reviewing a paper that you are writing; in time, they can make more substantial contributions.

Give Students Responsibility

If you give students a chance to be responsible, they will rise to the challenge. Students can search for their own funding opportunities, plan their own conference trips, write their own IRB proposals, schedule rooms for running subjects, develop stimulus materials, and so on. As faculty, we need to supervise, not micromanage. As students gain more experience with research, they are able to assume more responsibility. For example, lower-level students may begin by entering data. As they become more comfortable and acquire more knowledge about research in general and about certain projects in particular, they may eventually be able to make decisions regarding different aspects of those projects (e.g., whether to continue collecting data or whether to manipulate a variable). This type of involvement gives students the opportunity to learn from their failures, both of which will be important after they graduate.

Conclusion

Undergraduate research experiences can be some of the most academically challenging and rewarding experiences for students. Not only will your students gain valuable experience that will benefit them professionally, they will likely gain knowledge about themselves that will have a long-lasting impact on their personal lives.

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