

Supervising Undergraduate Students in a Faculty Driven Research Program

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Can you teach at a small liberal arts institution and conduct research in your field of interest? Have you ever wanted to have nationally or internationally recognized research? It is possible at a small college or university if you take advantage of your most valuable asset, the student research assistant.

This chapter has three goals. First we will address the major differences between faculty driven and student driven research programs including the conditions under which faculty driven programs are better suited. Second, we will discuss the benefits and costs to a faculty driven program for both professors and students. Finally, we will present some practical advice for the implementation of faculty driven programs, using current programs as examples.

Faculty Driven vs. Student Driven Research Programs

Within a faculty driven research program, professors have preexisting hypotheses or research programs for which they need assistance. Perhaps the primary researcher or faculty member has been working in a particular area for a long time and is systematically investigating related issues. One such example of a faculty driven research agenda is our current UNK program investigating police interrogation strategies. Studies in this area range from systematic investigation of the interrogation strategies themselves to an examination of jurors' perceptions of those strategies. Since 1999, the first author has been investigating the influence of certain strategies on suspect confessions. Each year, one or two students join her in this endeavor. Another such program involves Linda Henkel's work in aging and cognition at Fairfield University in Connecticut. With support from the National Institute on Aging in the form of a 3 year Academic Research Enhancement Award (AREA), she has been able to support over 30

students in their quest to understand how repeated attempts to remember information can lead to false memories (Henkel, 2006).

These types of research programs differ from student driven research or independent study because student driven programs usually involve hypotheses generated, examined, and presented by students under the watchful eye of a faculty mentor. As independent research at the undergraduate level gains momentum (Kierniesky, 2005), it becomes important to distinguish when a faculty driven approach can be practical if not more beneficial for all those involved.

There are several practical reasons for using a faculty driven model of research. First, because some projects have time-consuming methodology, it becomes necessary for different students to collect data. Longitudinal research is probably the most common example of this kind of dilemma. Second, this faculty driven approach is appropriate for those researchers conducting several small studies within a major theme or confirming a common hypothesis several different ways. Instead of just one faculty member conducting sequential research over time, he or she can have several research assistants conduct those studies simultaneously. Third, when investigating a novel area of study, it is not uncommon to test stimulus material or run pilot groups. For example, across several investigations of juror perceptions concerning police interrogation strategies, we have developed several questionnaires and techniques for assessing mock jurors' beliefs. Our findings appear even more reliable because of their convergence across methods. In order to maintain a research program of this type, one or more student researchers per semester are needed. Although the research program itself may last for years, the individual students tend to work only one or two semesters and then graduate.

Faculty Benefits and Costs

A faculty driven research agenda is an excellent plan for those at institutions with high teaching loads who are striving for tenure and need the requisite presentations and/or publications. Although this type of research program can be beneficial to students, faculty members clearly profit the most. From collecting data in their primary area of interest to making significant contributions to the field, faculty members at smaller institutions can dramatically impact their fields with the support of their undergraduate research assistants. As a result, these faculty members compare favorably to their counterparts at research-intensive institutions where graduate students are plentiful. Standing out in one's field increases chances for external grants and other forms of recognition such as research awards.

In addition to possible scholarship recognition, working with undergraduate assistants in ongoing research programs affords faculty more time in two distinct ways. First, faculty with undergraduate students capable of conducting research can spend more time designing research studies, and less time on day-to-day tasks such as collecting and entering data. Second, compared to supervising independent projects based on students' original ideas or methodologies that may not be in professors' primary field, professors may take less time to prepare for individual studies because their research is thematic.

In addition to benefits, there are also possible costs to a faculty driven research agenda. First, researchers may become stagnant if they continue investigating the same issues or if they ignore their students' creative ideas. Second, it can be difficult to sustain "research program memory" when the same study or related studies are conducted by different students over a long period of time. Keeping detailed Institutional Review Board documents and having students keep rigorous procedural notes make it easier to pass on wisdom from one student assistant to another. Third, in a climate of high teaching loads and a "publish or perish" mentality, faculty must plan for adequate supervision of research assistants. Unlike graduate students, faculty supervisors need to monitor undergraduate students who are often at different levels of their academic careers, accordingly. Regardless of the time invested, in the first author's experience, well-prepared, well-supervised undergraduates, perform comparably to average graduate students. Finally, because of the time consuming nature associated with an ongoing research program, we find it challenging to publish as frequently as necessary. Sometimes it takes concentrated effort to step away from the newest

hypothesis and spend the required time completing studies for publication.

Student Benefits and Costs

In addition to faculty benefits, there are numerous benefits for the undergraduate research assistant. Regardless of whether undergraduate research experience occurs in a lab course, as part of an independent study, or within a faculty member's existing research program, students benefit through increased student engagement, intellectual achievement, and preparation for graduate school (Elmes, 2002).

According to Light (2001), Cornell undergraduates surveyed about their reasons for attending the university remarked, "the faculty does cutting-edge research" (p 70). Yet cutting-edge research is not limited to Cornell and students can engage in similar experiences at other institutions. Because the level of interaction between students and their professors depends on student research competencies, experiences, and personal interests, student roles in ongoing faculty research vary from research assistant to collaborator. At any level of interaction, undergraduate students gain knowledge if faculty supervisors require those students to perform at higher levels. These experiences are vital for student success, regardless of whether they ultimately enter graduate school or an occupation upon completion of their undergraduate degrees. Compared to those undergraduates not engaged in the research process, students working with faculty often gain more analytical, presentation, and writing skills (Ishiyama, 2002).

Those students beginning a new research project with previous research experience can work more collaboratively, allowing those students unique opportunities in hypothesis development. In this case, students are encouraged to formulate their own research ideas while simultaneously gaining vast knowledge directly from an expert in that field. These ideas may potentially contribute to the overall research design, which in turn, assists the faculty member in evaluating the hypothesis in a new light. More immediate benefits to students include a better understanding of the positives and negatives of certain research paradigms, statistical tests, and comparisons of current findings to previous results. Given that the faculty supervisors evaluate, design, and monitor the research process at every level of interaction, students may contribute significantly to their supervisors' fields of expertise. As a result, students increase their likelihood of becoming first or subsequent co-authors on publications and conference presentations. This opportunity for

students mirrors those benefits found in many traditional graduate level programs for graduate students. Undoubtedly, undergraduate students are strongly challenged by these research experiences. Yet these challenges create immense opportunities for students to excel as researchers.

Although research assistantships are great resources for students, potential drawbacks should also be considered and addressed. Given the amount of time and energy that goes into the preparation of a study, students often do not get a chance to be involved in the research process during its most crucial stage—namely, when ideas are formed. Often, undergraduates join a program of research long after the initial research has been conducted and the proposal has taken off. As a result, students may develop a better understanding of such activities as observing and collecting data, but lack confidence in their abilities to develop research ideas, construct a working hypothesis, design a test of a working hypothesis, and write articles for publication (Kardash, 2000). This can leave students with limited opportunities to prepare for comparable tasks in graduate school. This finding suggests that student collaboration experiences differ from their assistant experiences. We agree that students with less experience and weaker foundations in the discipline will probably benefit more from serving as research assistants than their more experienced counterparts. Having said that, many students work as apprentices within ongoing research programs prior to developing their own independent research. As a result, their experiences assisting faculty should be beneficial when it comes time to develop their own ideas.

Tips for Establishing and Maintaining Similar Program

Based on our joint experience, we believe the benefits to a faculty driven research program far outweigh the costs. At this point we would like to share some issues to consider as well as some strategies for implementing a new program in an undergraduate curriculum.

1. *Consider whether you as a faculty member are ready to develop research and advisory relationships with undergraduate students.* Johnson (2002) found that undergraduates often emerge from research experiences lacking certain abilities. He surmised this may be due to the nature and structure of institutional research or, conversely, may reflect the belief that the mentoring (or in our case supervising) process simply occurs through natural interactions (Johnson, 2002). Although mentoring

usually distinguished from supervising by the degree to which teaching or guidance is offered, we believe becoming an effective research supervisor is similar to becoming an effective mentor. Therefore, we will apply many of Johnson's thoughts to this process. It can be quite tempting to simply give undergraduates a "laundry list" of things to do and send them on their way. Yet, neither the student nor the supervisor ever really benefit from this type of relationship. Because most new faculty are not born with effective supervisory skills, departments should establish supervisor training guidelines and reward individuals who are effective supervisors (Johnson, 2002). Examples of such rewards could include course release time, mentor recognitions, or even merit pay. If such guidelines are not readily available, individual faculty could spend time establishing ground rules for his or her supervisory experience. For example, an advisor may want to start by considering the costs and benefits of his or her own experiences as a research assistant. Examples could include the characteristics associated with his or her previous successes and/or failures, aspects of the research process needing improvement, and appropriate compensation for research assistants ranging from salary to authorship opportunities. Ways to resolve these issues will vary across researchers and institutions.

2. *Consider whether the current research agenda has the breadth with which to set up a comprehensive research program.* Not all faculty research interests are multifaceted or interrelated. Both characteristics help immensely in creating a productive research agenda supported by undergraduates. In the case of our University of Nebraska at Kearney lab we have two major veins of research currently underway. The first, systematic investigation of factors contributing to success and failure of police interrogations has supported student researchers for six years and resulted in 4 national presentations, 1 international presentation and two publications. Although we attribute much of the success of this research program to the timeliness of the topic, we also believe that continued student interest in conducting this type of research has contributed to its success. We have been actively pursuing the second research agenda, jurors' perceptions of evidence plays for two years resulting in 1 regional and 3 national presentations. Students co-authored on all but one of those products. Another factor contributing to the success of both of these programs involves their breadth. Zacks and Roediger (2004) outline several criteria to consider when starting a research lab which can assist even veteran investigators in avoiding research ideas which are too narrow. Suggestions relevant to the current article include a)

integrating projects by using either a common body of knowledge or a common methodology, b) considering the larger picture or your ability to apply research outcomes to larger theoretical issues, and c) only pursue those new projects which relate in some way to your existing program.

3. *Consider financial requirements for the type of research necessary and determine if students can be supported across multiple simultaneous or continuous projects.* Regardless, when it comes to developing a new research program or expanding an existing one, often cost is a factor. Yet not all projects require funding other than copying fees or time outside of class or work. At our university, students either volunteer or receive class credit for assisting faculty members. Similar to faculty at other institutions, some professors consider a research assistantship experience as a prerequisite before agreeing to supervise independent studies. Students earning the opportunity to present at a national or international conference are able to apply for university funds specified for that purpose. It is also possible to keep costs down by thinking about economical ways to ask expensive research questions. Consider jury research. Having mock juries composed of college students read scenarios is an inexpensive way to conduct jury research, yet these techniques provide indispensable pilot data. Using this data, researchers refine hypotheses and methodologies prior to conducting more expensive jury studies using paid jury-qualified community members.

4. *Determine the time requirements necessary and available for supervising all stages of individual and or multiple projects.* Regardless of the funds available, other costs of conducting research of this kind involve time and effort. When working with students we have found it particularly helpful when the primary researcher, in this case, the faculty member, maintains active participation at all levels of research. Specifically, faculty members should be actively engaged in reading the articles in the lit review, entering data, running analyses with students, interpreting the results, working on the discussion, and editing and or writing the documents. Because this is the faculty member's project he or she is ultimately responsible for its outcome. However, for students to get the most out of the research process we firmly believe it is also a teaching process. For example, faculty should work with students to understand how and why the project was developed. Since the ultimate goal is to present this research at regional, national or international venues, professors can be assured that the methodology, data and writing is sound because of their continuous involvement. Usually the undergraduates who choose to work as

research assistants are among the best but they often have questions, support needs, and concerns.

Professors should consider the amount of time necessary for the level of the students involved and only take on the number of students who can be supervised appropriately. One solution for increasing the number of students who benefit from your expertise while decreasing the time invested involves the use of research teams where students work collaboratively to assist the faculty member. Research teams can include similarly experienced students or differentially experienced students. In the case of differentially experienced student teams, both the professor and the more research savvy undergrads work together to acclimate the newest researcher.

5. *Develop criteria for different levels of student workers.* Regardless of the experience of the student workers it is important to develop standards or expectations outlining the roles for all participating students and faculty. As faculty researchers, it is not uncommon to have student assistants with different levels of experience or even different motivations for conducting research. For example, students at our institution can take research apprenticeship hours for one, two, or three credit hours. As expected, the number of credit hours corresponds to the amount of work expected. Other students may volunteer to conduct research without receiving credit but hope to co-author a presentation or paper with the faculty researcher. Regardless of the motivation for conducting research, both assistant and supervisor should have clearly defined criteria for performance. Contracts are one way to delineate responsibilities. Information that should be included in this contract includes expectations for the student (i.e., number of hours, specific responsibilities, required meetings), for the faculty member (i.e., degree of supervision, work contributions), and for the product (i.e., database, oral or poster presentation, publication). Given that the expectations for students entering data will be different from the expectations for students presenting research in its entirety to others, contracts make clear what is expected of each assistant.

6. *Maintain active participation at all levels of research.* As we have alluded to before, it is our firm belief that in order for research supervisors to also be truly effective teachers, they must learn to actively involve undergraduates in as many stages of the research process as possible. This is often difficult since faculty members develop research agendas long before students join the lab. Also, because undergraduates have little prior research experience faculty advisors may simply assign readings in a way that forces the undergraduates to play "catch up" rather than discussing those readings with them in a

way that enhances their understanding. In addition to assigned readings for undergraduate assistants, regular meetings should be held to discuss the relevant literature and the “how and why” of the research process beyond data collection or entry procedures. This is no easy task. Because faculty must manage competing demands on their time, the decision to neglect the research teaching process in favor of a minimal supervision is tempting (Johnson & Huwe, 2002). However, if the proper steps are taken, the benefits of the research assistantship for both faculty and students far outweigh the costs.

In addition to having research assistants maintain active participation throughout the process, faculty advisors should do the same. Examples include reading the articles in the literature review, either entering some of the data or reviewing the data entered by students, conducting statistical analysis and explaining rationale to students, remaining involved in the discussion and finally dissemination of results. Depending on their experience, having students edit your work can be eye-opening for all those involved.

7. *Creating a research culture.* Even when students work on such mundane but important tasks as data entry, they should still have a basic understanding of the faculty member’s hypothesis, its grounding in theory and the project’s relation to other work done in the area.

Quay and Quaglia (2004) describe several ways professors can create a culture in their classrooms that inspires student learning. We have modified some of these principles for the faculty driven research program. First, *create a sense of belonging* in your lab by making sure students know their work is valued and that your success is rooted in their success. Second, *recognize your students’ accomplishments, not just their grades.* Although many students will work for course credit or letters of recommendations, other types of success can also be recognized. Examples include understanding the gist of a difficult journal article or learning a new statistical technique. When supervising faculty comment on or even reinforce the improvements students make, it emphasizes the developmental process associated with becoming a researcher. Sometimes an individual student needs recognition or even praise to realize they have achieved an important milestone which is not only immediately fulfilling, but ultimately related to future success. Although grades are important, these latter skills will last much longer and form the foundation of any graduate research program. Third, *work to build moments of excitement into the project.* The most thrilling moment in a research project for us is data analysis. Will the result be what we predicted? Will it

be significant? Will it lead to other questions? If you are excited, the students will be excited too. Zacks and Roediger (2004) say it best. “One of the great features of academia is the opportunity for each researcher to identify the questions that gets his or her blood pumping and work on those” (p. 149). Finally, *provide opportunities for students to be leaders and take responsibility for their own research questions.* After the main study is completed or even simultaneously, allow students to ask questions interesting them. Most research projects have more than enough data to allow students to generate and test hypotheses of their own.

Final Thoughts

Whether you are a new faculty member establishing a comprehensive research program for the first time or a tenured full professor starting a new one, establishing programmatic research supported by undergraduate research assistants provides many benefits and manageable costs. What will make those student experiences different for individuals working with you as compared to your colleagues? The difference is the extent to which working for you involves collaborative as well as teaching moments.

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