

Real-Life Solutions to Real-Life Problems: Collaborating with a Non-Profit Foundation to Engage Honors Students in Applied Research

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Colleges and universities have long emphasized undergraduate research experiences as valuable activities for students. The National Science Foundation (NSF) echoed this focus in 2003, recommending that all students get involved in undergraduate research as early as possible in their college careers (NSF). Collegiate honors programs in particular have embraced the role of student research as an integral experience for high-ability students, leading the way in developing the thesis-based model of undergraduate research that is increasingly common in institutions of higher learning.

However, one difficulty in getting honors students involved in research, particularly early in their years at college, is that they misunderstand what research entails or see it only as the province of laboratory-based science majors. Even in social science programs such as psychology or sociology or in applied programs such as nursing or communication studies, where empirical research is central to the discipline, students may not understand the value of research in these contexts or may think that they do not have the skills or ideas to participate in the research process. When asked to define “research,” many students think only of laboratories, test tubes, and technical equipment, or they think of the ubiquitous research papers that they have already encountered in their classes and that they often see as summarizing the ideas of other people rather than contributing new knowledge.

Since the spring of 2012, the Minnesota State University, Mankato Honors Program has partnered with the Southern Minnesota Initiative Foundation (SMIF) to implement two separate approaches to developing honors students’ research skills and broadening their understanding of the research process. We incorporated applied research opportunities for honors students in two different settings: a course on research methods and an independent study

research experience. Each approach was successful at building students' confidence in their research skills, giving them experience with applied research practices, and broadening their understanding of what constitutes research. Each approach had various pros and cons that might be useful to other programs with plans to develop similar opportunities, and I include recommendations for how to form connections with community groups. The reflections completed by students who participated in these opportunities provide important perspectives that supplement my own as the instructor and faculty mentor for these experiences. Finally, in Appendix A I provide a letter from the president of the Southern Minnesota Initiative Foundation presenting his perception of their partnership with our Honors program.

INTRODUCING HONORS STUDENTS TO THE RESEARCH PROCESS

The first thing that came to my mind when someone talked about research was a picture of a mad scientist wearing a white coat with goggles over their glasses in an isolated room mixing colorful chemicals.

—*First-year honors student in the pre-nursing program, reflecting on research*

This comment sums up the thoughts and impressions of many students entering honors programs with the knowledge that they are required to complete an original research project. The honors program at Minnesota State University, Mankato is similar to most other college and university honors programs in that students are required to engage in an independent, original research project and to disseminate their results, generally through presenting their research at a conference. Most first-year students in our program and probably others seem to hold this narrow, mad-scientist definition of research and fail to see how non-science majors can get involved. Even science majors are often nervous about finding the time or having the skills to engage in complex experimentation outside of their class work. Many students believe that they will have to think of ideas to research all on their own without support or mentorship, and they view the research requirement as the most formidable obstacle in their path to graduating with honors.

However, a significant number of studies have detailed the benefits to students of participating in undergraduate research experiences across many different majors and disciplines. For example, Ishiyama demonstrated that students who participated in collaborative research experiences with faculty in their freshman or sophomore years showed gains in their abilities to think analytically and to learn on their own, emphasizing the importance of having

research experience in the first years of college. Landrum and Nelson as well as Hartmann, Widner, and Carrick emphasize the benefit of developing a one-on-one relationship with a faculty mentor as a result of working on a research project. Researchers have also noted career benefits: Landrum and Nelson report that faculty perceive student research experiences as needed preparation for graduate school, and Lopatto notes that these research experiences have “instrumental value in continuing the student’s career trajectory” (28) through enhancing their credentials for graduate school.

Scholars have found these positive outcomes when studying students from many different disciplines, describing the potential for both cognitive and interpersonal growth among all students who participate in undergraduate research. In addition, numerous and varied opportunities for independent research strengthen honors programs by helping them to serve students with a wide range of interests and career goals. Given that many honors programs require students to engage in research, they have a responsibility to show students the value of developing their research skills early in their careers while providing opportunities for all honors students to participate in the research process. However, providing these opportunities can be costly in time, materials, and personnel, creating challenges for honors directors and faculty. The Minnesota State University, Mankato Honors Program worked to address some of these challenges through collaboration with an outside organization, providing opportunities for students to conduct meaningful research without costly or complicated laboratory supplies or extensive training.

ENGAGING STUDENTS IN RESEARCH VIA A SERVICE LEARNING MODEL

We were able to make a difference in practice. . . . Our research had a definite purpose.

—*Sophomore psychology major reflecting on her experience conducting applied research for a community organization*

Although requiring independent research for honors students is designed to provide them with the benefits described above, many honors students find this requirement daunting and do not view research as an opportunity they wish to embrace. Providing students with applied research projects, where the data they collect is needed by an outside organization, is one way to help them see the value of the skills they are developing and the potential for research to make a significant difference in their own lives and in their communities.

Focusing on applied projects where students collaborate with an outside organization places this approach in the tradition of service learning, which has been shown to provide students with meaningful learning opportunities in

a number of contexts (Strage; Peters). Service learning balances equally the concepts of serving an outside constituent with enhancing student learning (Furco), and this was the model we felt would be beneficial to our students while also ensuring a continuing and useful partnership with external organizations. In addition, the focus on partnering with a community group connects to another of our honors program's major competencies: developing knowledge and skills in global citizenship. Service learning is a form of civic engagement and has been successful at building citizenship, community engagement skills, and responsible attitudes in students (Levine; Deeley).

Although the use of service learning as an experiential educational tool in all disciplines has grown rapidly in recent decades (Harkavy & Hartley), using service learning specifically to build students' research skills is rare at the undergraduate level even though, at the graduate level, it has been built into programs like occupational therapy (Schindler). Research and service learning are nevertheless a natural fit given their shared experiential focus, especially since community groups are continually pressed for time and resources that student researchers can provide. Contributing a needed resource to local community partners while at the same time providing an opportunity for students to develop their research skills makes a research-based service learning experience a valuable addition to honors programs.

Most honors programs do provide courses that cover topics related to information literacy, the ethical conduct of research, writing, and critical thinking, all of which serve to build skills that students need to engage in research. However, the service learning paradigm builds in a practical component as well: Students can experience first-hand various methods of collecting data, summarizing results for a non-academic audience, and recommending future practices or continued research, all while providing meaningful help to their community. Also, college and university students can bring another resource to community partners: The students' access to library databases gives them the ability to provide useful literature reviews or contrasting viewpoints to the outside organization, an exercise that simultaneously builds students' information analysis and writing skills. Finally, as a result of research-based service learning, students not only develop their research skills but see clearly the purpose of their work in furthering the goals of a community organization, making the research process more concrete and rewarding and potentially increasing their interest in continuing to do research.

COLLABORATING WITH A COMMUNITY PARTNER TO PROVIDE STUDENT RESEARCH EXPERIENCES

Our work was productive and beneficial for others, which made this process so much more rewarding.

—*Sophomore psychology major reflecting on completing research for the Southern Minnesota Initiative Foundation*

To connect our students with research opportunities while serving a community partner, we approached a local non-profit, the Southern Minnesota Research Foundation (SMIF). SMIF is one of six regional groups throughout the state of Minnesota that were created in 1986 by the McKnight Foundation (see <<http://smifoundation.org>> for more information). Currently, they receive funding from the McKnight Foundation as well as from federal grants and local donations. SMIF focuses their grant and loan programs on supporting entrepreneurs and early childhood development programs. For example, SMIF has worked with local communities to support pre-school programs in providing educational resources to students. SMIF also manages loan funds targeted to small business development and awards grants to businesses working to build collaborations within their communities. The diverse interests of SMIF make them a good partner with our program as they have been able to suggest a wide range of research needs for their various programs and activities that connect with students' majors or interests.

The first contact with SMIF came at a committee meeting at our university where local business leaders connect with faculty and administrators to develop new partnerships that might benefit students. The president of SMIF expressed interest in working with our honors program, suggesting that students could help provide hands-on research support. We followed up with several meetings with SMIF personnel, culminating in a list of specific research needs that would help SMIF advance their programming and ensure that they were providing the most useful opportunities for local communities. SMIF was a good partner because they were already familiar with the university as well as the honors program and were committed to establishing new opportunities for students.

As honors directors consider the potential benefits of collaborating with a community partner in order to provide opportunities for students, they need to weigh many factors: for example, the availability of courses through which to offer these projects or experiences; the availability of faculty to teach courses or mentor students independently; the extent to which students can earn credit for their work; the types of skills that students need to develop; and the needs of the community partner. Because our students need to develop general research

skills and SMIF has diverse research needs, our partnership has allowed for a broad flexibility in student research and in ways that faculty can structure the experience, contributing to the overall success of our initiatives. Even though SMIF identified particular areas where they needed research support, students have had considerable freedom to develop specific research questions within those areas. Honors directors who have a high level of flexibility in their requirements of students and who seek out a community organization with a high level of flexibility in their needs and projects may be best poised to make the most of a potential partnership as they will be able to manage expectations fluidly and develop applied projects to serve everyone's needs and interests.

INCORPORATING APPLIED RESEARCH PROJECTS INTO A RESEARCH METHODS COURSE

When looking at the big picture, research proposals are not just written papers, but rather a real life solution to a real life problem.

*—Sophomore business student completing an honors course
on research methods that incorporated SMIF projects*

To teach honors students the basics of research using a hands-on approach, we developed a semester-long research methods course that included small research projects provided by SMIF related to their early childhood funding initiatives. The first half of the course covered topics such as operationalizing variables, ethical considerations involved in research with human participants, development of survey and interview questions, and observational research designs, after which the students completed a literature review on a topic of their choice related to early childhood development. In the second half of the course, small groups of students worked on the research projects identified by SMIF to provide them with feedback and data on grant programs related to their early childhood education funding initiatives. Students developed materials, collected data, and presented their final products to representatives from SMIF at the end of the course. (See Appendix B for a week-by-week course schedule with topics and major course projects that can be readily adapted to a wide range of course types and instructional goals.)

One group of students, for example, examined ways for local pre-school teachers to improve their assessment of the cognitive and motor abilities of the children in their classes. The students developed a parent questionnaire to complete at the beginning of the school year so that teachers could combine their own observations of the children with the parents' ratings of children's skills and abilities. Students met with local representatives from pre-school

classes, learned about their assessment needs, and then designed the questionnaire. They gained feedback on the questionnaire from pre-school teachers to assess its usefulness for their needs and how well it mapped onto their own assessments, revising it accordingly. The students provided the questionnaire to SMIF to distribute to local pre-schools for their use and developed suggestions for future research to continue revising this form of assessment by, for example, tracking the extent to which parents' ratings correlate with teachers' observations.

In addition to these applied projects, students were led through the process of conducting and writing a literature review as well as a research proposal. The students engaged in the project described above wrote literature reviews that examined research on early childhood education and development, and they wrote research proposals that suggested ways to extend work on the measure they had developed. Students' reports of the knowledge that they gained from the course focused mostly on the writing skills they had developed. One student commented that "whether I will be writing a letter to my manager or writing a thesis for a doctorate program, writing skills I have developed will be of great importance in my future." This student not only saw the potential transfer of skills to her future work both in and beyond college, but she also grasped the centrality of writing skills to the research process, whether synthesizing the work of others in a literature review or proposing empirical data collection to answer a research question.

One drawback to focusing on writing literature reviews and research proposals, however, was that students had less time to develop their applied research projects; many students were able only to collect preliminary data or develop measures for future use rather than complete extensive data collection and analysis. The applied projects thus became a secondary aspect of the course and the writing pieces primary. However, most of the students had not had prior experience with applied research, and as a whole they were engaged by their brief experiences in this area. One student noted,

In most of my other classes much of the critical thinking and analysis has already been completed, so doing new research or thinking above and beyond is not really necessary. However, in this course, we were able to use the information we learned in class and our own creative ideas to 'go further' than the normal class.

In general, even though the time spent on the projects was limited, students were able to see the value of the work that they put in for community organizations. Honors directors who work to develop applied research experiences in their own programs can present these as opportunities for students to work

with real-world issues or problems, which will engage student interest in seeing the tangible results of their work.

DEVELOPING INDEPENDENT RESEARCH TEAMS TO WORK ON APPLIED RESEARCH PROJECTS

This project has given me confidence to pursue research as an undergraduate, especially as part of a research team.

*—Sophomore education student reflecting on her experience
working on an independent research team*

Although the research methods class was an effective way to provide students with exposure to core concepts of empirical research in an applied setting and succeeded at enriching their understanding of the value of applied research, we also wanted to explore options for giving students more time to work on the empirical data collection potential in these projects. To the extent that student teams could collect, analyze, and summarize meaningful data related to SMIF initiatives, their findings could also be more useful to SMIF and fulfill a need for the non-profit as well as a learning experience for the students. We decided to use a model of independent research teams in the following academic year to collaborate with SMIF on new research needs. These teams were open to any interested student regardless of their prior coursework or experience with research. Students could still have the option of registering for credit, but independent research teams led to more flexibility for both the students and the faculty mentor and also opened up new opportunities for presenting the completed projects at local academic conferences as the students had more time to collect and analyze data and to develop presentations.

To guide the students through this process, a faculty mentor volunteered her time to work with the students and serve as a liaison to SMIF. Although working with these research groups was an addition to the workload of the faculty mentor, our university values facilitating undergraduate research, and the student production of research presentations can help faculty achieve some of their own goals toward tenure and promotion. Ideally, faculty members who work with students on independent research projects should be compensated in some way for their time through workload reduction or additional monetary compensation. Issues of compensation are not unique to our university; Guzy, for instance, examines faculty compensation for teaching honors courses or participating in other honors program activities. In our case, the rewards for the faculty mentor were the several undergraduate research presentations presented under her supervision and the development of her own research and mentoring skills through working on these applied projects.

Prior to the academic year, the faculty mentor connected with SMIF, which had identified two projects for students to work on: one on the experiences of local businesses that had participated in a SMIF-funded workshop on succession planning and the other on a survey of local school-based preschool programs about their needs and experiences in implementing a new standards-based rating system. In both cases, the projects had the potential to provide SMIF with valuable feedback about the success of their grant programs and workshops as well as information on where to concentrate funding resources in the future. In addition, the projects gave students the opportunity to develop specific research questions, construct surveys to test the research questions, collect data, and summarize findings. The research teams were formed over the first month of the fall semester, and then the students began finding background information and developing survey questions to provide the feedback that SMIF wanted.

Eight students expressed interest in working on these independent research teams, resulting in two teams of four students, one working on each focus identified by SMIF. In each case, the teams developed a survey to send to respondent lists provided by SMIF, obtained IRB approval of the survey, conducted background literature reviews on the topic of their project, summarized results, and created a professional report for SMIF detailing their work and their recommendations based on the findings of the survey. In addition, the students were asked to submit a reflection once a month detailing what they had accomplished and learned about research during that time. The faculty mentor convened research team meetings as needed (generally every other week) in which she reviewed the students' work, discussed the next steps in the project, and talked about any issues that had arisen. The faculty mentor offered suggestions when needed and helped the students set goals of what needed to be accomplished to advance the projects. Also, the faculty mentor served as the primary liaison with SMIF, keeping the non-profit updated about the progress of the research and passing on questions from students as they arose.

The students' reflections from the fall semester, which detailed their initial involvement and steps to design their surveys, showed that they were hesitant at the outset, expressing some of the concerns and stereotypes about research that we have commonly found in our students. One wrote, "I was really nervous to start this project because I felt like I didn't know what I was doing, or if I was even smart [or] qualified enough to start on a research project." Another said, "I had always thought of research as boring and un-enjoyable." Responses like these show the importance of overcoming students' negative expectations about research and building their self-confidence that they can successfully complete such a project. By showing students how the research process is broken down into steps, setting clear tasks and expectations throughout the

course of the project, and reviewing student work with constructive criticism and positive comments, the faculty mentor worked to ensure that students were confident in their work and to build their understanding of the research process.

The students worked on their research projects over the course of an academic year, spending the fall semester in developing the surveys, researching background information, and obtaining IRB approval while in the spring semester they focused on data collection, analysis, and preparing their reports. In addition, both teams of students submitted their projects for presentation at on-campus and off-campus conferences and sought on-campus grant funding to offset research costs, giving them experience in writing abstracts and grant proposals and in developing and presenting research posters. Having an entire academic year allowed students more time to see the research process through from conception to dissemination, leading to a richer experience for the students. One student stated, “[Presenting at a conference] was one of the best experiences I have had thus far in research because I was able to share it with a lot of people,” and another noted, “Other people’s questions and comments made me see our data in a new way and increased my understanding of our research.” In developing conference poster presentations for the general public, students thought deeply about how to explain the value of their projects in ways that were easily understandable. All of the students on the research teams found their presentations to be positive capstone experiences for their projects.

In addition, the students gained experience working effectively in teams. They had to work together to design the surveys, summarize the results, and prepare their presentations. Team work was a challenging experience for many of the students, one of whom stated, “Before joining this research team, I never relied on others to do quality work and I would always undertake every responsibility.” Many of our honors students report negative experiences with group and team work in their courses; they are frequently the ones to take on more work to cover for lack of effort by others, and therefore they often approach these types of projects with an assumption that they will have to do everything. However, with this project, the students were teamed with other honors students, helping them trust in the work of others. Also, the faculty mentor took care to provide clear goals and a timeline as well as to prompt the teams to consider how they would split up work, thus helping students avoid issues of miscommunication or uncertainty about how to participate.

All students reported a positive experience with teamwork in their reflections, and for many this part of the project was the most surprising or useful. Halfway through the project, one student stated, “The most important thing I have taken from this project so far is the ability to trust others,” and another

said, “Being part of such a highly motivated group of people has shown me the huge benefit of working on a team, and has raised my opinion of collaborative projects.” This positive experience seems to have made a powerful impression on their attitudes toward working together on large projects.

Honors programs that incorporate any kind of research experiences for students as requirements should consider as primary learning goals not just completing the research itself but also formally presenting it to others. Another important goal is positive team experiences that will be necessary for students’ success in graduate school and/or their future careers. In addition, in collaboration with outside groups, students learn to understand organizational needs while designing the research and communicating their findings to the group, aspects of research that can be lost in more traditional research experiences. The letter in Appendix A presents the benefits of this experience as perceived by SMIF and shows the success of the students’ work.

Their applied projects allowed students to see both how their research was contributing to an existing knowledge base and how their findings could help directly improve their communities. One student stated, “As I began to explain to others why our research was relevant and important to society, it really began to sink in for me. I realized that we were doing a service to not only SMIF, but to parents in the community.” She saw that their survey of local pre-school programs would be used to improve these programs and would make a real difference in the lives of local families. Seeing first-hand the relevance of their work is another benefit of applied research that is rarely available in more traditional research experiences.

DISCUSSION AND RECOMMENDATIONS

This project allowed me to see how important research is as an undergraduate and the wonderful effects it can have on real-world experiences . . .

—Sophomore psychology student’s reflection after spending a year completing an applied research project

Through working with the local non-profit SMIF, students in the honors program at Minnesota State University, Mankato have had opportunities to develop their research skills through both coursework and independent experiences that included designing surveys, collecting data from community respondents, analyzing and summarizing results, and preparing professional reports and posters to communicate the project outcomes to SMIF and to the general public. Overall, their experiences suggest that students developed a better understanding of the research process, improved their writing and communication skills, and gained experience working effectively with teams. In addition, working with an outside organization helped to reduce some of

the workload for the faculty instructor and mentor as SMIF provided general topics, participant groups to study, some background resources, and opportunities for students to present their findings. These experiences benefitted both students and SMIF, and this collaboration will provide a source of meaningful research opportunities for students in our honors program in the years to come.

Applied research experiences where students collaborate with an outside organization like the ones described in this paper are particularly effective at providing opportunities for students to collect data and connect their findings to community issues or the particular needs of the outside group. However, engagement with a community of scholars through theoretical research got less attention; in both the course and the projects, students' research questions and data collection were driven more by the specific needs of the outside organization than by sustained literature analysis of the overarching concepts and issues connected to the project. One concern about applied research, therefore, might be that students will miss the ongoing conversation between scholars and experience research as isolated instances of data collection that do not speak to a broader picture.

In future research collaborations with SMIF, however, we hope to build a more in-depth literature review into the project and push students to connect their particular measures and findings to other research done on their topics. Former students or teams involved in the projects could, for instance, present their findings to new groups of research students; the new teams could be prompted to consider how they can build on the work of previous students. Even though students are exposed to different models of research in their other coursework, applied research experiences that focus on data collection should still provide opportunities for students to connect their work to prior literature and findings in order to develop a deeper understanding of the research process.

With such adjustments, applied research is a valuable strategy for honors programs, which may be particularly situated to work well with community, non-profit, and business groups as they often have students from many different majors and disciplines who need to complete a research project. For example, an applied research experience may be particularly well-suited to students majoring in areas such as business, economics, or marketing, where they can develop skills learned in other classes. In addition, many honors programs emphasize community engagement and citizenship, which result from connecting students with community organizations. Applied research is a powerful way to engage talented students in their community while building their research, writing, and communication skills.

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APPENDIX A

SMIF PRESIDENT TIM PENNY DISCUSSES THEIR PERSPECTIVE ON THE PARTNERSHIP WITH THE HONORS PROGRAM

For the past two academic years, our Foundation, the Southern Minnesota Initiative Foundation (SMIF), has partnered with the Minnesota State University-Mankato (MSU-M) Honors Program. In many respects this partnership has been highly beneficial to our Foundation and to the Honors students.

As a regional economic development foundation, SMIF has concentrated its work in two key areas which we believe will determine the future vibrancy of our twenty-county service area. We invest in early childhood programming—as we believe it to be a long-term bet on a quality workforce. We also invest in entrepreneurship through small business lending, technical assistance and economic development grants in order to grow and sustain new businesses within our region. In both categories of our work, we establish benchmarks to measure the success of our investments.

The ability to access the research skills of MSU’s Honors students has allowed us to more thoroughly examine the effectiveness of some of our programs. Each year, we identify research needs that would offer students a practical, “real world” research experience—on a project that would be relevant to our Foundation’s needs. For example, the research conducted on our business succession planning work helped us to understand the best aspects of that work and make adjustments in our strategy. Similarly, the research project on availability and quality of pre-school programs helped to inform our Foundation’s ongoing early childhood efforts.

Going forward, we intend to identify additional research projects—and to coordinate more closely with the directors of the Honors program to enhance the research process and strengthen the results and recommendations growing out of the process. We believe the team approach has improved the quality of the research work. We also believe that allowing the students additional time—throughout the academic year (as was done this past year)—to conduct their research provides for a better opportunity to review background material, conduct surveys, and collect data. We are also hoping that our relationship with the MSU-M Honors program may lead to the creation of internship opportunities here at SMIF.

REAL-LIFE SOLUTIONS TO REAL-LIFE PROBLEMS

In all, I strongly feel that this MSU-M Honors program partnership has been, and will continue to be, a “win-win” for both the university and the Southern Minnesota Initiative Foundation.

Respectfully submitted,

Timothy J. Penny

President, Southern Minnesota Initiative Foundation

APPENDIX B**WEEK BY WEEK SCHEDULE FOR THE RESEARCH METHODS COURSE**

Week	Topic and Major Projects
Week 1	Course overview, description of scientific method
Week 2	Comparison of science with pseudoscience, aspects of empirical research
Week 3	Types of research strategies, types of variables, ethical considerations
Week 4	Use of library databases and search tools
Week 5	Conducting survey research, overview of first course project—literature review
Week 6	Workshop of literature review drafts
Week 7	Conducting experimental research, comparing laboratory to field research, drafts of literature review due
Week 8	Course presentations of literature review project, final literature review papers due
Week 9	Overview of applied research projects, formation of project teams
Week 10	Conducting observational research, developing data collection strategies for applied research projects
Week 11	Conducting program evaluation research—using research findings to improve practice
Week 12	Writing a research proposal—connected to applied research projects to suggest next steps for projects
Week 13	Working on applied research projects—finalizing data collection, interpretation, and recommendations
Week 14	Workshop of drafts of applied research papers, with future research proposal included
Week 15	Presentations of applied research projects to classmates and representatives of SMIF
Finals Week	Final drafts of applied research papers due