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Integrating Undergraduate Research into Social Science Curriculum: Benefits and Challenges of Two Models

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Abstract: Evidence shows that undergraduate research is beneficial to students during their college years and beyond. This study evaluates two models for integrating undergraduate research into the college curriculum: (1) integrating a community-based research project into a social science course and (2) designing a senior seminar course as an undergraduate research experience. Findings show that students benefit from a hands-on research experience that deepens their understanding of both survey methods and social issues. While, students who participated in the community-based research project enjoyed interacting with community members and learning about community concerns, students in the senior seminar research experience ranked all aspects of the research project more favorably than students participating in the community-based research project. We discuss the benefits and challenges of both models as well as the implications of these findings and the steps instructors can take to improve the learning experience of undergraduates in the social sciences.

Keywords: student engagement; undergraduate research; senior seminar; community-based research

1. Introduction

For the past two decades, student engagement has emerged as an organizing construct for higher education assessment and improvement efforts. The premise of student engagement is clear-cut and easy to understand: the more students study a subject, know the content, apply what they know, and receive feedback from faculty, the deeper they understand what they are learning. They also are more adept at managing complex situations, tolerating ambiguity, and working with people from different backgrounds or with different beliefs and values [1,2]. Examining students' experiences is important because student engagement in educational activities positively affects student learning and success during college [3–6]. Engaging in a variety of educational activities during college also helps to build the foundation of skills and temperaments people need to live a fulfilling, productive life after college. In other words, engagement helps to "develop habits of the mind and heart that enlarge their capacity for continuous learning and personal development" ([2] p.5).

Undergraduate research can be viewed as the embodiment of engaged learning. Undergraduate research includes scientific inquiry, creative activities, and scholarship [7]. Under this definition, undergraduate research ranges from the analysis of historical documents to writing musical compositions to scientific experiments. The value of undergraduate research is that it can be used to attain a wide range of educational goals. Undergraduate research can lead to empowered learning (including problem solving and teamwork), informed learning (allowing the student to study the natural, social, or cultural world), and responsible learning (approving the study of the self and social problems) [8]. It assures benefits exhibited in the National Student Survey of Engagement (NSSE) student engagement benchmarks—academic rigor, active and collaborative learning, meaningful

student-faculty interaction, enriching educational experience, and a supportive campus environment [2]. Furthermore, undergraduate research can occur inside the classroom, such as a senior seminar or a first-year experience; outside of the classroom, as part of a lab or internship; in the sciences, social sciences, or humanities; as an intellectual exercise or as social action; and it can be done on campus, in the community, or abroad.

2. Literature Review

2.1. Growth in Undergraduate Research

Since the Boyer's Commission [9] request for research-based learning at the undergraduate level, United States' colleges and universities have greatly expanded their formal undergraduate research programs [10,11]. While the authors of the report first conceptualized undergraduate research for undergraduates at research universities, Hu, Kuh, and Gaston Gayles [12] found that more recently, undergraduate research programs in liberal arts and doctoral institutions have outpaced similar programs at research universities. In examining undergraduate experiences at 15 US research universities, Douglass and Zhao [13] found evidence that students completing a research project, creative activity, or paper as part of their coursework was common. However, despite an increase in undergraduate research, less than 50 percent of students participated in research-intensive courses or assisted faculty with research outside of the classroom. Furthermore, participation in research differed based on gender, race, major, class level, and aspiration to go to graduate school [13]. For example, only 18 percent of students had assisted faculty in research for course credit. Furthermore, they found that student aspirations seemed to be linked to research engagement. Overall, students aspiring to be researchers, scientists, and psychologists were more likely to assist faculty with their research. In addition, students who conducted independent research studies as undergraduates were more likely to desire masters' level professional degrees. However, from the Douglass and Zhao [13] study it is hard to determine whether ambitious and academically engaged lower-division students seek out research opportunities or if engaging in research leads to a desire for further higher education.

Not only has undergraduate research become more common in colleges and universities, but what qualifies as undergraduate research has also expanded. The duration and type of undergraduate research activity can differentially affect the gains received by students and faculty [14]. In the social sciences, one common way to train undergraduates in social scientific research has been for faculty to guide undergraduates on research projects. This can be in the form of an independent study in which the student develops and conducts a research project under the guidance of a faculty member for college credit or by working directly with a faculty member on a portion of the faculty member's research. While an advantage of this type of undergraduate research is that the student typically is immersed in the project for an extended period while building a strong relationship with his or her faculty mentor, a disadvantage is that a single faculty member can train only a small number of students [15]. Whereas this may be ideal for small colleges and departments with a small number of majors, a large number of undergraduates attending research universities, in which departments tend to be larger and have graduate programs, may never get the opportunity to work directly with a faculty member on research. An alternative to faculty-directed research projects is a research-oriented course. For the social sciences, a faculty member teaching a research-oriented course uses a classroom setting to teach students how to conduct social science research. In these types of courses, a faculty member can provide research training to more students than he or she can on a one-to-one basis.

2.2. Undergraduate Research and Student Skill Development

Several studies conclude that undergraduate research has multiple benefits for students. These benefits include increased research productivity, stronger interest in a research career, increased confidence in conducting research, and a greater likelihood toward seeking a higher degree [16,17]. In a broad evaluation of NSF's undergraduate research programs, 75 percent of student respondents

reported an increased interest in a STEM career after being involved in research [18]. Those who participated in undergraduate research also reported enhanced problem solving, analysis of literature, and communication skills [19–23]. While the consensus is that students benefit from undergraduate research in multiple ways, Buckley et al. [24] assert that the nature and extent of student involvement in undergraduate research determine the level of benefit. Students who are more involved in reviewing literature, contributing to research questions and active in data collection, analysis, and presentation of findings are more likely to report gains in skill development than students who are involved in superficial tasks.

Furthermore, it is crucial for students to engage in undergraduate research in order to develop research competency. Cuthbert, Arunachalam, and Licina [25] found that undergraduate students are disconnected from their professor's research and what their professors teach them in class. Many students were even unsure about what one does to conduct academic research during their undergraduate years, suggesting that even intensive coursework does not develop research skills or an understanding of research that compares to conducting actual research [25]. Beyond gaining skills directly related to research development, Shostak et al. [26] concluded that undergraduate students who participate in research projects also gain a greater understanding of research and more self-assurance in their own researching skills. Students who participate in undergraduate research develop their abilities to consider multiple kinds of data and approaches simultaneously. Their study showed that undergraduate students develop these skills through working on research collaboratively, when the students can hear and consider their peers' suggestions and input while they conduct research [26].

The benefits of undergraduate research also lead to personal development, including increases in self-confidence, independence, tolerance for obstacles, interest in the discipline, and sense of accomplishment [8]. Personal development provides general benefits regardless of the career path the student takes. Whether in or out of academia, the research skills that students develop while conducting undergraduate research are applicable to many professional careers.

2.3. Purpose of the Study

Overwhelmingly, evidence shows that undergraduate research is beneficial to students during their college years and beyond. However, many studies on undergraduate research focus on STEM fields. Social science research is fundamentally different from STEM research, given that the research respondents are humans. Different challenges are present when working with humans, such as concerns related to safety, confidentiality, and validity (Recently, renowned astrophysicist Neil deGrasse Tyson claimed, "In science, when human behavior enters the equation, things go nonlinear. That's why Physics is easy and Sociology is hard" [27]. Due to the different tasks associated with social science research, it is important to explore different models of undergraduate research to identify tactics that are beneficial to student learning and those that pose problems to either student learning or research validity. In this study, we evaluate two models for integrating undergraduate research into the college curriculum: (1) integrating a community-based research project into an upper-level course and (2) designing a senior seminar course as an undergraduate research experience. We raise the following questions:

1. What aspects of each research model do undergraduates perceive to contribute to student learning?
2. What components of each research model are problematic for effective student learning?
3. Which research model do students favor more with respect to learning research?

Finally, we discuss the implications of these findings and the steps instructors can take to improve the learning experience of undergraduates.

3. Research Methodology

3.1. Course Design

3.1.1. Community Research Project

The community research project took place during the spring of 2015. We advertised the research experience campus-wide by placing ads in the university newspaper, posting flyers on campus, emailing majors in the College of Liberal Arts, and having liberal arts faculty announce it in their classes. Students were required to have an overall GPA or GPA in their major of 3.0 or higher. In total, 32 upper-level undergraduate students participated in the research project, 60% were classified as seniors and 40% were juniors. All received 3-credit hours for their participation in the project, by enrolling in an internship or independent study with one of the faculty members involved in the project.

The community research project was a part of a larger project funded by the National Science Foundation that combined research, pedagogical, and service missions into a single project. The community research project model drew on three basic principles. First, the project was intentionally interdisciplinary in order to break "silos" of departments and to draw on the insight of multiple disciplines in policy-relevant research. Second, students were explicitly included in the project through class enrollment that required participation in data collection both to enlighten pedagogical material and acquire practical skills. Finally, the research topic was grounded in local issues that were of interest to citizens and stakeholders. It specifically focused on concerns that were on the local agenda, providing new information about public opinion into the debate.

Students attended five training sessions during the first eight weeks of the semester. Because the research experience was not a formal class with a set meeting time, the training sessions occurred in the evenings when all students could meet. The training included an introduction to the community study, safety briefings provided by local law enforcement, information about surveying and sampling, and specific training for the community survey. While students were not directly involved in designing the survey, they were trained on how to ask the questions, record their answers, and field any questions that respondents may have had with respect to the survey or specific survey items. Since we asked questions on the survey about local community issues, students were made aware about the issues, why they were important to study, and what were the study's major research questions.

Students were paired up based on their schedules and each group was provided with a list of 118 residences to survey. In total, there were 16 pairs. When surveying, students wore specially designed t-shirts for the project. The t-shirts said "(name of town) Project" on the front and "Student Researcher" on the back. Before they set out to survey, they had to check in with their assigned graduate teaching assistant (GA). Once they checked in, they went door-to-door (by walking or driving) to the residences on their list. Students read from a prompt that described who they were and what they were doing. They asked the head of household if they could do a survey that covered several community issues. If the resident agreed, the student surveyor instructed him/her to sign a consent form and the students began to administer the survey, with one student reading the questions and answer choices and the other marking the resident's answers. If a resident wanted to take the survey but did not have time at that moment, the students left the survey with the resident and picked it up later. After the pair of students was finished for the day, they checked out with their assigned GA. Students made three attempts for each address (on three separate occasions) before marking it off their list as unanswered.

For their safety and to minimize response error, students had to follow a number of rules when surveying residents. These rules were 1. Always work in pairs; 2. Never enter a respondent's house; 3. One of the two must carry a cell phone; 4. Call 911 if there is an emergency; 5. Let your assigned GA know when you are going into the community to survey and when you are done; 6. Record the results of attempted contact with respondents on the printed address list; 7. When at a computer, record the results of the attempted contacts in the google documents spreadsheet. Do this as soon as you can; 8. Make three attempts at each address; 9. Do not show anyone unassociated with the project the

addresses or maps of the potential respondents; 10. The person not recording the survey results should use the response sheet to show the respondent the possible response choices. Graduate assistants were advised to stay in touch with their assigned pairs, be available when they were in the field surveying, and help students keep track of which households were surveyed, which households returned surveys, and the number of attempts for each household. They also entered survey data.

3.1.2. Senior Seminar

The senior seminar class was a 400 level course that upper-level students took in the Spring of 2019. Twelve students participated in the course, 50% were graduating seniors and 50% were juniors or seniors graduating in the fall. The main goal of the course was to give students a general understanding of how scholars conduct social research. To do this, students were involved in a class research project that integrated information and skills learned in previous courses. As a class, students were expected to 1) formulate empirical research questions; 2) identify proper methodology to study the research questions; 3) identify proper sampling techniques that will lead to low levels of error; 4) design all materials needed to conduct research; 5) obtain human subjects approval; 6) collect data on the research questions; 7) analyze the data; and 8) present findings at a major sociological conference.

As a class, students discussed general social topics of most interest to them. During the first two weeks of class, they narrowed down their interests to two broad social topics. With the instructor's assistance, they formulated two empirical research questions that they believed the literature inadequately addressed. Based on their social research questions, the instructor provided them with sample survey questions used in Pew Research surveys, the General Social Survey, and previous surveys of the instructor. The instructor tasked each student with developing five survey questions she or he wanted to include in the class survey. The questions could be taken from previous surveys or be the student's own creation. The instructor merged all of the students' survey questions into one document, sorted by topic. In class, students, with the instructor's assistance, revised the survey by removing duplicate questions or questions that seemed not to fit with the rest of the survey, rephrasing question stems and answers, and ordering questions in a manner that flowed well. After the first round of revisions, the survey was eight pages long. Each student then performed cognitive interviews with five other students (not taking the class) to see which questions needed further revision. During class, students made a few final revisions based on the results of the cognitive interviews. With the help of the instructor, the class transformed the final paper version of the survey into an online survey using Survey Monkey software.

Through a Freedom of Information Act request, the class secured the names and emails of all undergraduate and graduate students at the university. In Microsoft Excel, an algorithm assigned students a random number from 0 to 1 and then sorted them by the random number. The class sampled the first 5888 students from the sorted list.

In March of 2019, the class emailed students a message with a link to an online survey. In the body of the email, they explained who they were, how they received their name and email, and what the survey covered. In addition, they explained that they were gathering information about students' perceptions on a variety of social issues, that their decision to participate or not to participate in the study would not affect their performance in any of their courses including the courses in which they were currently enrolled, that they had to be at least 18 years old to take part in the study, and that they could opt-out of the study by clicking on unsubscribe. On the consent page of the survey, they assured them that their answers were completely confidential, that only people directly involved with the project would have access to survey responses, all survey material was password protected and would be destroyed after it was electronically coded, and only summaries of the data would be released in which one's answers could not be traced back to a particular individual.

From the initial sample size of 5888, 941 students completed the online survey. In addition to the online survey, each student visited a classroom, with the instructor's permission, and surveyed

students in the classroom who had not filled out the online survey. An additional 157 students completed the survey in the classroom bringing the total completed surveys to 1098.

During class, students entered data from the 157 paper surveys into Microsoft Excel and merged the datasets with the online survey datasets. They also examined the data for inaccuracies and cleaned the data. During class, students watched as the instructor conducted univariate, bivariate, and multivariate analyses on the major independent and dependent variables, along with conducting descriptive statistics for the sample. While the students did not conduct the higher-level statistics by themselves, they needed to know how to interpret the regression tables.

In April 2019, students, along with the instructor, attended a regional conference that was nearby. The instructor divided the class into two groups and each group presented during a roundtable discussion. So that students would not have to bear the cost of presenting, the instructor's department funded all travel, lodging, and registration expenses for students.

3.2. Assessment

For both research experiences, at the end of the semester, the instructor administered a survey to the students to assess their experiences with the research project. The survey included 11 Likert scale items asking students to rate how much they agreed (5 = strongly agree) or disagreed (1 = strongly disagreed) about different aspects of developing and administering the survey, learning survey research, and participation in the course (see Table 1). Of the 11 items, seven were included in surveys administered to students in both research experiences. In addition, we asked three open ended questions: (1) Overall, what did you find to be the most valuable part of this project? (2) Overall, what could be improved the next time we carry out a project like this? (3) Do you have any other comments about the project? The students also participated in a focus group session, led by a graduate teaching assistant, in which they answered in depth questions about their involvement in and perceptions of the research experience. Finally, for the students enrolled in the senior seminar class (the second research model), their preparation and discussion of their major project at a roundtable discussion at a regional sociological conference served as another form of assessment. This included describing the social research questions, the dependent and independent variables, sample, and methodology, and presenting the univariate, bivariate, and multiple regression results. They also were responsible for asking and answering questions at the end of the roundtable presentations.

Table 1. Univariate and bivariate statistics for variables by type of course.

	Community Research Project		**Senior Seminar Course**		
	Mean	**SD**	**Mean**	**SD**	***t*-Test Statistic**
I enjoyed talking to residents about issues on the survey.	3.93	1.00	—	—	
I learned a lot about local issues through this experience.	4.00	0.73	—	—	
In general, I learned about research design through this experience.	3.67	1.03	4.50	0.53	2.39 *
I feel confident in being able to conduct my own survey in the future.	3.80	1.05	3.88	0.64	0.19
I felt safe administering the survey.	4.13	1.00	4.38	0.52	0.53
The survey was easy for respondents to complete.	3.00	1.07	4.25	0.46	3.90 ***
My graduate assistant was helpful.	3.53	1.34	—	—	
The faculty directors/professor were helpful.	4.20	0.89	4.63	0.52	1.27
Overall, my participation in this project was a great learning experience.	4.07	0.91	4.63	0.52	1.91 +
I would do a project like this again in the future.	3.93	1.10	4.13	0.83	0.43
Presenting at the Midwestern Sociological Society was a valuable experience.	—	—	4.5	0.53	

+ $p < 0.10$. * $p < 0.05$. *** $p < 0.001$.

4. Results

4.1. Student Experiences in the Community-Research Project

Overall, students had a positive experience participating in the community-research project. With respect to participating in the project, students on average agreed that overall their participation in the project was a great learning experience ($\overline{x}$ = 4.07) and that they would do a project like this again in the future ($\overline{x}$ = 3.93). Undergraduate students also had a positive experience interacting with community members. On average, students agreed to the following statements: 1. I enjoyed talking to residents about issues on the survey ($\overline{x}$ = 3.93), 2. I learned a lot about local issues through this experience ($\overline{x}$ = 4.00). Several students mentioned getting involved with the community as the most valuable part of the project. As one student stated, "I most enjoyed talking to people even with language and cultural barriers". Similarly, another student claimed, "I learned how to talk to other strangers who might not have wanted to talk to me otherwise". One student had a slightly different take, stating "Getting out and collecting data like this is an excellent way to make people feel as though their opinions matter". Two students expressed how they most enjoyed learning about the community. For example, one claimed, "Overall, I learned that a majority of the residents in the east side of town are getting the wrong end of the stick when it comes to a lot of different issues". Similarly, another student stated, "A lot of residents did not want to participate in the survey because it was too long, but they did inform me of on-going problems that are occurring in the community".

Students also had a positive experience with respect to learning survey methods. On average students agreed with the following statements: 1. In general, I learned about research design through this experience ($\overline{x}$ = 3.67), 2. By working as a surveyor, I feel confident in being able to conduct my own survey in the future ($\overline{x}$ = 3.8). A few students mentioned the research experience as the most valuable part of the project. According to one student, "The most enjoyable part for me was learning about how much effort and time is put into a survey. It showed how much work it takes just to start a survey". Similarly, another student claimed that the most valuable part of the project was "learning how much work goes into survey research". Many student groups realized that not only was surveying difficult, but that they would need to adjust their tactics to receive responses. For instance, as one student claimed.

After a couple survey days, the team decided that it was almost impossible to get people to fill out the survey on the spot. This led them (the team) to skip that step most of the time and simply start off with giving them the survey to fill out on their own and coming back. This greatly increased our success even if a few surveys were lost along the way.

This same student acknowledged that through this experience, "I gained an immense amount of knowledge about surveying".

While students enjoyed meeting with community residents and learning about community issues and appreciated how difficult it was to correctly put together and administer a survey, the community-based research project had some major pitfalls that the students pointed out. Perhaps the biggest problem the students experienced was getting the respondents to complete the survey. The students partly contributed this to the length of the survey. The item on the student survey that students ranked the lowest was "The survey was easy to read to respondents". The average score for that item was a 3. Students mentioned that the survey should be less complicated and more organized with fewer questions. As one student noted, "Many people looked at the size of the survey and declined because they assumed it would take too long. Others, who did choose to fill out the survey, took much longer than the 15–20 minutes stated". Students also had problems with residents declining outright. One student mentioned how their team was ignored by some residents who were home and could be seen through the windows. Other people answered the door but stated that they did not have time, were not interested, were heading out, or were not residents. Some who answered the door did not live at the residence; and therefore, did not qualify as head of household.

Another issue of concern for some students centered on safety. While precautions were taken to ensure the safety of student surveyors and no incidents occurred, some students experienced a few abnormal encounters. For instance, a few residents, while not shy to talk to the surveyors, had issues with the students surveying certain homes. According to one student, "When arriving to give a survey to one resident, she stated to the team that, 'We should avoid X house because they were criminals'". According to the student, the same resident made sure to avoid letting those neighbors see her give them her completed survey. One survey team experienced a man approaching them after they knocked on the door of an older woman's home. The man stated, "The man who lives across the street would be very angry if he saw you talking to his mother". The most concerning incident involved a large group of men standing outside the parking lot of one of the public housing buildings where one survey team was surveying. According to one student, the men were commenting and yelling at the survey team. When the team finished surveying in that area, they noticed that the men were closely looking at the team's car. According to this student, the incident caused the team to feel uneasy and they decided not to go back to that building a second or third time.

The last major concern students expressed centered on communication with other team members, GAs, and professors. According to one student, one student on his team did not receive any of the emails from professors that included useful information about gift cards and meetings due to the professors having an incorrect email address for the student. Two students mentioned how they would email their GA supervisor and never get a response, while another student claimed he would get a response from his GA supervisor part of the time. The lack of communication between students and GA supervisors became problematic when students needed to find replacement partners. For safety reasons, students always needed to be in the field with at least one other student. However, sometimes a student would fulfill his/her hours more quickly than his/her partner resulting in the partner needing a replacement. Under this circumstance, it was important that the student surveyors and GA supervisors had effective communication given the short time frame for surveying residents. In this particular circumstance, it took over a week for the student to find a new partner to finish surveying.

4.2. Student Experiences in the Senior Seminar Class

Overall, students had a positive experience participating in the senior seminar project. With respect to participating in the project, students on average agreed that overall their participation in the project was a great learning experience ($\overline{x} = 4.63$) and that they would do a project like this again in the future ($\overline{x} = 4.13$). They also would recommend the course (as it was taught that semester) to be taken by other social science majors ($\overline{x} = 4.25$). When compared to the community-based research project, students participating in the senior seminar course were more likely to agree that their participation in the project was a great learning experience ($t = 1.91$, $p = 0.07$)

Students also had a positive experience with respect to learning survey methods. On average, students agreed with the following statements: 1. In general, I learned about research design through this experience ($\overline{x} = 4.5$), 2. By working as a surveyor, I feel confident in being able to conduct my own survey in the future ($\overline{x} = 3.88$). They also felt safe administering the survey ($\overline{x} = 4.38$) and believed the survey was easy for respondents to complete ($\overline{x} = 4.25$). Nearly all students mentioned the research experience as the most valuable part of the project. According to one student, "We developed a research experience that many students on campus do not have while allowing us to do it during class time". Students appreciated developing the survey through a "step-by-step" manner and learning how to administer a survey (both online and face-to-face). When compared to the community-based research project, students participating in the senior seminar course were more likely to agree that they learned about research design through this experience ($t = 2.39$, $p = 0.03$) and that the survey was easy for respondents to complete ($t = 3.90$, $p = 0.001$).

Undergraduate students also believed that presenting at the regional sociology conference was a valuable experience ($\overline{x} = 4.5$). As one student noted, "What I found to be most valuable was learning survey and presenting skills which I would not have had otherwise". Several other students specifically

mentioned attending the regional sociological conference as being the most valuable part of the course. As one student noted, "Presenting at the Midwestern Sociological Society's annual conference was an extremely valuable experience that will help me in my future". Eight of the nine students presented at the regional sociology conference toward the end of the semester (one had to miss due to an illness). Students presented their research during two roundtable sessions (four students per session). During the roundtable sessions, they took turns discussing their research questions, methodology, results, and discussion and all actively participated in the question and answer session at the end of all presentations. They enjoyed the more laid-back atmosphere of the roundtable session and found the discussion with other students and faculty at the end of the session to be rewarding. In addition to presenting, each student had to attend other sessions or plenary talks. Overall, students found these to be rewarding and especially enjoyed the plenary talks, as the speakers discussed new, socially relevant research in areas that interested them.

Students in the senior seminar course had two major concerns that they believed the instructor could improve. The first concern they had dealt with the analysis of survey results. Students would have liked to have done more analysis in the computer lab rather than watch the instructor conduct analyses. While students were more comfortable with describing the univariate statistics and bivariate statistics, they were unsure about the higher order statistics, such as regression. A second way they thought the instructor could enhance the course for students was to have the course taught during their junior year, instead of their senior year. Several students planned to go to graduate school the following year and would have benefitted by being able to include the research experience in their application materials for graduate school. Since many universities have February deadlines, students could not include many details about the research experience in their graduate applications.

5. Discussion

In this study, we described and compared two different models for providing undergraduates with a research experience. The first model was community-based research for which students received training and collected data outside of the classroom. Students volunteered for the research experience and could get credit as an internship or substitute the research experience for taking exams in one of three social science courses taught by the instructors. The second model provided an undergraduate research experience through a required senior seminar course. Since the instructor designed the course as a research experience, students met twice a week and, with the assistance of their instructor, designed, implemented, analyzed, and presented their own research project. While students in the first research model focused solely on survey methods and data collection, students in the second research model were involved in all aspects of the research process from formulating research questions to presenting results at a regional conference.

Like similar studies [28,29], we find that engaging undergraduates in a semester-long research project benefits undergraduate students. Students benefit from a hands-on research experience that deepens their understanding of both survey methods and social issues that they can use in the workplace or in graduate school. Students who participated in the community-based research project enjoyed learning about community issues from the residents they surveyed and several perceived interacting with community members to be the most valuable part of the project. Students from both models believed they learned about research design; however, students in the second model were more likely to strongly agree with the statement. Except for the questions that pertained to interacting with the local community members, students in the second model ranked all aspects of the research project more favorably than students from the first model. This may be due to several challenges that students faced while collecting data in the community.

For the first model (community-based research project) there are certain challenges that faculty must consider. Some challenges relate to communication and logistics, while others are specific to the community. While the use of GAs minimized the workload for faculty, some students had problems communicating with their graduate student advisor. While some GAs were quick to respond to

students and assist them in a timely fashion, others were not. Unfortunately, these students did not let faculty know about spotty communication between GAs until the end of the project. If GAs serve as advisors, some mechanism needs to be in place to ensure they are keeping track of undergraduates in the field, responding to their queries, and assisting them, or contacting a faculty member to assist them. Faculty must have continued contact with GAs to ensure they are keeping track of their undergraduate advisees and constant contact with undergraduates to make sure that they are able to contact their GA and if not, that they can contact a faculty member. In addition, some students had trouble with being able to find times to survey with their team. Although professors paired students with other students that had similar schedules, some students' schedules changed mid-way through the semester. Better communication among professors, GAs, and undergraduate students would help with dealing with these types of logistical problems. One solution would be to have more meetings take place during the data collection phase that focus on addressing problems as they arise in the field. Another solution could be to use group texting or social media to pair up team members for going out in the field.

A second challenge that some students encountered while participating in the community-based research project was a feeling of danger when surveying residents. Instructors assigned student teams to neighborhoods in the community that were close to each other so that students on foot would not have to walk too far. Due to the fact that the town is very segregated with wealthier residents on the west side of town, poorer residents on the north side of town, and students in the center and east parts of town, some teams were assigned to neighborhoods where they felt a bit unsafe at times. Faculty researchers anticipated safety concerns beforehand and had police officers provide some training on safety to the students. There were also strict rules about not surveying after dark, to survey in pairs, and to be in contact with their GA. While no major incidents occurred, sometimes, community members warned teams not to survey certain residences and in one case, a team felt uneasy when a group of men was outside shouting at them, as they knew they did not live in the neighborhood. Because instances like this was anticipated, neighborhoods that were less safe were assigned to teams consisting of men with a car. Teams that surveyed on foot or teams with only women were assigned to safer neighborhoods. In one case, a student expressed to the instructor that she did not feel safe surveying. She was immediately taken out of the field and assigned other tasks for her to complete related to the research project. These instances illustrate that faculty should assess the community before sending students out to survey residents. The study community was below 25,000 residents and had relatively low numbers of violent crime. Therefore, with the safety training and precautions taken, faculty felt that surveying residents in the field posed little risk to students. For communities or neighborhoods with relatively high crime rates, a different methodology may be necessary for students to participate in community-based research, such as leading focus groups [28] or conducting in-depth interviews [26,30,31]. These methodologies allow students to gain knowledge about community issues, but in a more controlled setting such as a place on campus.

Unlike the first model, students conducting research under the second model (undergraduate research taught as a required course) did not have any issues with safety or communication. Since the students chose to survey students, they were able to gain access to their email addresses to connect them to an online survey. They also were able to survey students in the classroom. While some students had to contact two or three instructors before they could get one to allow them to administer the survey to their classroom, every student was successful in administering a paper version of the survey to at least one classroom. This was important because it gave each student an opportunity to talk about the survey's purpose and to discuss confidentiality and the consent form. By collecting paper surveys, students also learned how to code and input survey data into a spreadsheet. Students believed they learned the most about survey construction and data entry and believed that presenting at the regional sociology conference was a valuable experience. Indeed, these were the most applied components of the course. Several weeks were dedicated to constructing, testing, and revising the survey. Similarly, students inputted survey data during four class periods and students participated in the conference for three days.

Students were less confident in conducting the statistical analyses required to test their hypotheses. While the instructor conducted analyses in SPSS during three class periods, students did not conduct the analyses on their own. Students presented their results at the conference and correctly interpreted all results; however, they were not required to conduct their own analyses or write up a report explaining their findings. This was mainly due to a time limitation. One way to amend this problem would be to coordinate the class with an earlier research methods class. Under this model, students in the research methods class would work on a research proposal that requires one or more research questions and a detailed methods section (with a proposed questionnaire or interview guide) knowing that they would conduct and analyze the research the next semester in the research seminar class. This would provide more time for the students to conduct their own analyses and write a results section on their own to present at a conference.

Students had favorable experiences with both research models. However, students had more favorable ratings in the second model that allowed students to be involved in the whole research process. Since data collection, especially community data collection, can take up much of a semester, we recommend the research experience 1. be taught as a formal course and not as something extra; 2. be paired with a research methods class so students can work on the research questions and data collection instruments before taking the research seminar; 3. be designed to allow students to be involved in all aspects of the research design, collection, and analyses; and 4. allow for an opportunity for students to display their research at either a disciplinary conference or a university-wide conference/poster session.

This recommended model may be useful for other scientific disciplines as well. Crowe [32] found that a three-year scholarship program for biological science students that emphasized student engagement through required student research, attendance at professional development workshops, and participation in a 4-day long summer institute increased students' sense of belonging, perceived faculty support, and student satisfaction of their major. However, the scholarship program was competitive and students had to have at least a 3.0 GPA. Furthermore, while students worked in faculty labs outside of the classroom, they received $10,000 per year from the scholarship program. If it were not for the funding provided from the scholarship, many would not have the time to work in the lab as they would be working at a part-time job to support themselves.

Faculty and upper administration can take measures, similar to what we outlined above, to create the same conditions for all their science majors without the need for a large federal grant. Since students are more likely to drop out of school or switch majors by the end of their sophomore year, departments can set up a required sophomore-level course that introduces students to research in the field and requires them to work with a professor in her/his lab as part of the class. Departments can also set aside funds for student travel to conferences such as departmental distance education money. Similarly, departments can set up an on-campus institute early in the fall semester that students would be required to attend. Over the course of two days, students would attend workshops, listen to speakers in their field, participate in fun activities, and present some of their research. On-campus student research conferences or symposia is one approach to involve students in disseminating their research findings locally. Students would be required to attend or present as part of their course-work in the major.

Student engagement is complex; it includes many factors that interact in multiple ways that can either enhance engagement or trigger disengagement. In this study, we examine two models for undergraduate research in the social sciences. Based on the study's findings, we provide several recommendations to achieve a rewarding research experience for all students, including students in traditional STEM majors. Future research is needed to determine how such a model can be successfully applied to STEM majors and if it is successful in increasing student engagement and retention.

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