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Helping Undergraduate Students Learn from Each Other: A Pedagogical Process for in-Class Collaborative Research Projects

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Abstract

Previous research has shown that experiential, active, and collaborative teaching techniques help undergraduate students learn and develop critical thinking, communication, and teamwork skills that can help them in future study or work place roles. At the same time, universities are seeking ways to increase the number of students who get training and experience doing original research while undergraduates. This paper reports on a process for a collaborative in-class original research project which can help instructors achieve these goals. This paper first briefly reviews the relevant literature and then describes the course and the collaborative project. The value of the project in facilitating student learning is assessed by a discussion of student work, student evaluations, and student responses to a pedagogical survey. The strengths and weaknesses of the project and ways an instructor could modify it to meet specific goals are also discussed.

Keywords: active learning, research methods, collaborative projects, pedagogy, undergraduate courses

1. Introduction

Previous research has shown that experiential, active, and collaborative teaching techniques help undergraduate students learn and develop critical thinking, communication, and teamwork skills that can help them in future study or work place roles. Undergraduate students can benefit greatly from opportunities to do original research which develop skills in study design, data collection, preparation, and analysis, and apply what they have learned in their substantive area courses to a real world topic or problem. However, in many departments undergraduate original research experiences are limited to methods classes and/or capstone projects or senior theses. When a department does not have a major, even these types of experiences may not be available. Faculty time is also a scarce resource that discourages instructors from requiring original research projects in their courses. At the same time, universities are seeking ways to increase the number of students who get training and experience with original research while undergraduates.

This paper reports on a course design and process for a collaborative in-class original project which can help instructors achieve these goals. With some investment of instructor time and organizational effort, the teaching of original research skills through experiential learning can be integrated, if not completely “across the curriculum”, then at least in a much wider range of classes and levels of undergraduate instruction than is usually done. This paper reports on an entry level sociology course for sociology minors and students taking the course as a general education elective. The students and the instructor collaborated on an original research paper which was written almost entirely during class time.

This paper first briefly reviews the relevant literature then describes the course and the collaborative project and the procedures used to make it work. The value of the project in facilitating student learning is assessed by a discussion of student work on the project and student responses to a pedagogical survey. The paper includes a discussion of strengths and weaknesses of the project and ways an instructor could modify it to meet specific goals.

In American colleges and universities undergraduate education is largely viewed as something that occurs via structured events specifically designed to educate. In undergraduate courses students typically read textbooks, articles or books on the course topic, listen to lectures, discuss the material in class, and take exams and/or write research papers on the topic of the course. Much time and effort are expended, on both the students’ and the instructor’s part, for assignments and papers that may be discarded after they have been graded. While the student has undoubtedly learned and developed their skills through these assignments, these types of assignments may fail to motivate or interest today’s generation of students (Garcia 2006, 2008b).

In this paper I propose a teaching approach which is designed to provide a more engaging process through which

students can learn. This is a "learn by doing" approach which I refer to as the "pedagogy of the real" (Garcia 2006; 2008a; 2008b). In addition to traditional, individual assignments (such as a take home final asking them to synthesize and integrate their learning from the course and from reading three assigned books and set of journal articles), the instructor and the students worked together in class to produce a coauthored original research paper on a topic chosen by the students.

The instructor guides the students through a collaborative process of reading and evaluating previous research, brainstorming ideas for the research project based on this previous research, choosing a research topic, writing a research question, deciding which research subjects to interview, writing an interview guide, conducting interviews (each student was required to conduct and transcribe one interview; the data were pooled for the class project), working together in class to read and summarize articles to be used in the review of the literature section of the paper, analyzing the data in small groups, and drafting and revising portions of the paper in small groups in class.

The paper which we created was submitted to a regional sociology conference and was accepted for presentation in a roundtable session on integrating the student's experience. While I obtained a grant from the university to fund two of the students to attend the conference and help present the paper, unfortunately the students who volunteered were unable to attend so I presented the paper on our behalf.

While courses involving undergraduate students doing research are fairly common, courses which incorporate public dissemination of the results of the research into the course design are not. Students in the class learn the basics of how to do qualitative sociological research (including learning about human subjects protection, interviewing techniques, and basic analysis of the data). Instead of artificial, instructor-created "educational" assignments, the work of the class is thus subtly transformed into producing a real product through which the results of the class's research will be disseminated to the public. The hope is that the student is motivated to learn about the subject matter of the class--not just to get a good grade on assignments, but to produce good data and analysis for the group project.

2. Review of the Literature: Towards a "Pedagogy of the Real"

There are three important aspects of this pedagogical innovation which are supported by previous research: active learning, experiential learning, and collaborative learning. First, there is an extended literature on the benefits of active and experiential learning (e.g., Bonwell and Eison 1991; Cross 1987; Chickering and Gamson 1987; Garcia 2006, 2008b; Marlin-Bennett 2002; Pedersen 2010; Broughton 2011; Sutherland and Bonwell 1996; Teixeira-Poit et al. 2011; Wolsk 2003). Meyers and Jones (1993) argue that

active learning provides opportunities for students to talk and listen, read, write, and reflect as they approach course content through problem-solving exercises, informal small groups, simulations, case studies, role playing, and other activities--all of which require students to apply what they are learning. (Meyers and Jones 1993: xi)

Meyers and Jones (1993) found that the use of active learning approaches also makes learning more collaborative; an added benefit for today's students. McDuff (2012) found that use of a collaborative learning process in an undergraduate theory course improved student learning outcomes as well as their interest in the subject matter of the course.

Hutchings and Wutzdorff (1988) advocate experiential learning because they find that course work does not always readily translate to skills in the workplace (see also Watts 2003). They argue that:

There is a tradition in education of assuming that what is learned in the classroom will make a difference in the large world of public life and professional work, that classroom learning will somehow connect with or have an impact on students' experiences outside the classroom. What we have seen, however, is that for many students the gap between knowing and doing is large, indeed. (Hutchings and Wutzdorff 1988: 2)

Sullivan (1991) advocates that undergraduate students should be taught to conduct research in the context of their course work in order to prepare them for graduate studies or research-related employment.

There is agreement in the literature that undergraduate courses using active, experiential, and/or collaborative learning approaches may be more effective instructional procedures and may better assist students in making the transition from the student role to workplace roles. The course described in this paper achieves all three dimensions. The proposed project also adds the public dissemination of the results of the students' research through a conference paper submission, giving the learning process real world impact rather than merely serving as a pedagogical exercise.

3. Description of the Course and Collaborative Project

This assignment was used in a sociology course called "Animals in Society." The purpose of the course was to explore the relationship between animals and humans in contemporary society from a sociological perspective. The course was an entry-level course open to freshmen through seniors who could use the course toward a sociology minor or to fill a general education requirement.

Students learned about a range of issues and topics regarding how humans use and relate to animals, and learned about a range of approaches to conducting research about animals in society through their readings, class lectures and activities, and class discussions. They completed individual assignments (writing daily quotes and questions on the readings, conducting and transcribing an interview, and writing a take home essay final intended to integrate learning from the semester) in addition to participating in the class group research project.

The description of the in-class collaborative original research project from the course syllabus is copied here:

The class will work together to write a collaboratively authored paper based on the interviews conducted by class members. We will select the topic for the interviews and write the interview questions together in class.

a. Each student will find one person to interview. They will audiotape the interview and make a verbatim transcript of it. Excerpts from the interview may be used (with permission from the person interviewed) in the group ethnography project. (25 points)

b. The group project will be co-authored by all students who complete the course, including the instructor--*the instructor will be listed as first author; all student coauthors will be listed alphabetically*. This paper will be submitted to [regional sociology conference] to be held in [conference location and dates].

If the paper is accepted, an attempt will be made to get a grant to support travel expenses for some of the class members to attend the meeting and present the paper. If that is not possible the instructor will present the paper on the class's behalf.

c. We will create working committees to do the work of analyzing the data, researching the literature review section of the paper, drafting the paper, editing the paper, and preparing the conference submission. Each student will be asked to join at least one of these committees. *As much of the work as possible for putting the paper together will be done during regularly scheduled class time*, but students may have some work to take home to finish in terms of drafting and editing portions of the paper. (Class participation including work on the group project is 25% of the grade).

Briefly, the instructor guided the students through a process of choosing a topic for the project and framing a research question, deciding what types of research subjects to interview, writing an interview guide, conducting individual interviews and transcribing them, reading an extended bibliography of sources for the lit review section of the paper and summarizing them, working together in class to analyze the pooled interview data, and drafting and revising the paper.

4. The Role of the Instructor and the Process of Doing the Work

During the course I guided the students through a process of first learning about qualitative research approaches in sociology (including the symbolic interactionist perspective and the semi-structured interview method). We then covered the reasons for protection of human subjects and the procedures and forms to be used for doing so. We then began reading the books and articles on the syllabus, focusing our discussion of these works on a range of substantive issues relevant to the topic of the course. Our discussion also focused on the students' quotes and questions, and the instructor gradually worked toward an understanding of what a researchable question was and how such questions can be developed from reading other's work on a topic.

When we had finished the bulk of the reading for the course, we spent parts of several class periods brainstorming ideas for research questions that grew out of the materials read. Appendix A shows one of the preliminary lists of questions that came from students' written questions and those suggested in class during our discussions of the readings. This list shows that a wide variety of potential research questions were suggested by

the students. I copyedited them and handed them out to the students at our next class, where we further narrowed down our choices. I used a reiterative, preferential voting process for the students to narrow down which of the many topics they wanted to use for the group project. Appendix B shows the question the students decided to use for our class project (the “overall question”).

The purpose of the handout in Appendix B was a "worksheet" for the students to create an interview guide for the semi-structured interviews we planned to conduct. Note that on the bottom of the page there are five potential interview questions already listed. These had been generated in a previous class by the students. I typed these onto the form, and also left space for more questions to be added. The students worked in their small groups during class to brainstorm ideas for additional interview questions. At the end of the class each group handed in one copy of the form with their suggested questions and the names of their group members. Most groups chose to type these into their laptops and email them to me. I then collated all of their suggested interview questions and organized them thematically into the interview guide (Appendix C). This guide shows the large number of useful interview questions the students had come up with. The same type of process was used for all of the tasks of analyzing the data and writing up the paper.

Students were each required to find one person to interview using our interview guide. When each student had conducted their interview they emailed me the audio file and their transcription of the interview. I then listened to each audio tape and made corrections as needed (students received individual grades on their tapes and transcripts). I then made copies of the corrected interview transcripts for each student in the class. Each student received a complete set of these in a folder, which I handed out at the beginning of each class and then collected at the end (in order to minimize lost or forgotten folders). Each group was then assigned a subset of the interview questions to analyze. For example, Group 2 was assigned the questions about “Your Relationship With Your Family’s Dog.” They worked together to read through all the transcripts and discover how each interviewee had answered the six questions in that theme. They tallied the answers that could be answered numerically, and summarized those that needed a qualitative description of the findings. They identified the most representative quotes from the interviews so that examples of relevant responses could be cited in the paper as needed. As the students worked on these tasks I went from group to group answering questions about coding or the interpretation of interviewees’ responses. I provided handouts with empty tables for the tallies; between classes I collated their results and brought them back to the next class for the next stage of work.

When the analysis of the data was complete we then shifted to drafting sections of the paper. Groups were assigned to draft the section they analyzed, then to help edit another group’s section. When the rough drafts of the sections of the paper were done, at the end of class one member of each group would email me their work. I would do some editing and reorganizing, but mostly I made suggestions and asked questions so they could fix or add things during our next class. We finished drafting the paper by the end of the semester.

After the course ended, I received a small grant from the university to hire one of the students from the course as a research assistant to help me with the final revisions to the paper. Since we had submitted an abstract for the paper to a regional conference, I had to “fact check” the entire paper. I had already checked the transcripts so I knew the interview data were reliable, but with the help of the research assistant all of the coding of data was also checked. I also went back to the articles cited in our literature review and reread them to make sure our use of previous literature was accurate, and I added some additional citations to the paper. The research assistant and I both copyedited the paper and proofread for errors. The final edited version of the paper that was presented at the conference was the same paper the class had written together but was thoroughly checked and edited for “quality control.”

While the role of the instructor was therefore quite demanding for this course, it provided the students with an active learning, collaborative experience which should benefit them in a variety of ways. Together they worked through every stage of writing an original research paper, from the discovery of topics of interest and reading previous research to develop new research questions, all the way to the writing and revising of the manuscript.

4.1 Potential Difficulties with the Technique and Possible Solutions

This method worked well in my class of 28 students. If the instructor is working with larger numbers of students, it may be necessary to split them into subgroups in order to keep the work groups of manageable size. I chose to invest some instructor time outside of class editing, organizing, and at times typing short paragraphs of students’ work, and to create the tables from the students’ collated data. I reserved in-class time for students to engage in intellectual labor, discussion, and analysis rather than these more mundane activities. However, constraints on the instructor’s time and/or the desire to have students learn to accomplish these supportive tasks as well could be handled by assigning each group some outside tasks. I chose not to do this in my class, because I was using a

hybrid model—teaching a regular class with in-class discussions, lectures, films, a fairly heavy reading list, and several individual writing assignments—in conjunction with the collaborative group project. I wanted to contain the students’ work on the group project to in-class time as much as possible, to avoid over-burdening the students with individual work. I also wanted to provide a workshop-like environment in which the students were all learning from each other as they figured out how to do the tasks involved in designing, executing, and writing up an original research project. However, an instructor could choose to make the collaborative project the entire course or the bulk of the course, thus opening up more outside-of-class student hours for handling the more mundane tasks of the collaborative project.

5. Assessment and Evaluation

The university has students complete online standardized course evaluations for every course taken. For this course, the student’s responses to the questions on the survey ranged from 5.2 to 5.52 (on a scale of 1 to 6, with 6 being the best score). I also administered a pedagogical survey directly to the students in class during the last week of the semester with questions about the readings, assignments, and teaching methods used in the course. The students were also asked to evaluate the experience of conducting interviews, participating in the collaborative research project, and sharing in the in-class group work. Twenty-six out of the 28 students in the course were present and completed the pedagogical survey.

Almost half of the students reported that they had no previous experience with original data collection or conducting interviews, thus indicating that there is a need for more of this type of experience in the curriculum. Students were asked to rate their responses to a set of questions about various aspects of the collaborative project on a scale of 1 to 6, with 6 being “to a great extent” and 1 being “not at all”. Table 1 shows that the results were positive, with high proportions of the students finding the different aspects of the group project beneficial.

Insert Table 1 here

A separate set of questions asked students about their experience with the group work on the project. More than half of the students said that the “group members worked together very well,” with 100% (26) saying that they worked together either very well or reasonably well. 92.3% of the students rated the distribution of labor in the groups reasonably to very fair. In spite of the innovative nature of the course, all except two of the 26 students felt they learned at least as much from this course as from other courses at the university they had taken, with 30.8% stating they had learned more from this course as from others they had taken.

6. Appropriate Contexts for Collaborative In-Class Research Projects

One of the things I hoped to demonstrate with this paper is that even students who are not sociology majors and who have not completed a research methods class can benefit from an introduction to research methods and an opportunity to conduct original research. As Healty-Etten and Sharp (2010) demonstrate, undergraduates can be taught a considerable degree of skill in interviewing if deliberate steps are taken to accomplish that goal. Similarly, my project demonstrates that even non-major students can also be taught to develop a research question from a review of the literature, conduct interviews, analyze the data, create at least basic interpretations of the data, understand the study’s limitations, and develop policy recommendations from the research findings, if they are explicitly taught to do so. I found that this collaborative in-class research project was an effective way of accomplishing those tasks in an engaging way which drew the students’ interest. The method could be effectively applied to courses in a wide range of substantive areas within sociology or other social science disciplines. The size or type of the institution offering the course is probably not a relevant factor, but class size is. The method will probably work better and be easier for instructors to manage if class sizes are under 30.

7. Conclusions

I conclude that the in-class collaborative original research project was successful in enhancing student’s understanding of how sociological research is done and their skills in accomplishing it, and that the in-class work was an essential component of the learning experience. It is also a more efficient use of instructor time to organize and facilitate one group project rather than work on separate original research papers with each student. The collaborative in-class nature of the project enhances student learning in several key ways. The pedagogical purpose of the in-class group work was to obtain the benefits for the students of working together with others while avoiding the problems with scheduling, cooperation, and other problems associated with outside of class time group work. While small group projects completed outside of class are appropriate for more advanced students, the goal of this course was to provide an educational experience that would be appropriate to the skill

and developmental level of students ranging from freshmen to seniors. A second pedagogical purpose was to enable the students to ask the instructor questions when they arose to facilitate learning and to benefit from the instructor's guidance and knowledge as they worked through the tasks of doing research. A third pedagogical benefit is students were able to learn from each other through the in-class process. Fourth, the shared and public nature of the process provided a built in incentive for the students to try to do a good job at all aspects of the project—the fruits of their labor were shared with the class, and they could compare their work with that of other students. I therefore believe that doing group work during class time was an effective use of class time. Providing students at all levels with the opportunity to do original research in the context of entry-level substantive area classes is a viable approach to expanding our students' exposure to research.

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Appendix A: Examples of Students' Preliminary Ideas for Research Questions

I. Questions that arose from students' class discussion and course readings about the use of animals as food:

- a. A transition to a vegetarian lifestyle requires a strong commitment when a person is living in a society in which meat eating is the norm. What factors affect whether a person who believes we should not eat animals is able to successfully adhere to a vegetarian lifestyle or not? What are some of the challenges in their path? How does this differ from a person who chooses to eat meat in a predominantly vegetarian society? What personal, social, religious, cultural, political or economic factors affect individuals' decisions about whether to eat meat or not?
- b. Does an individual's level of knowledge about the reality of animal farming and slaughter affect their decision about whether to eat meat or not? What types of rationalizations or belief systems do people use/hold to justify their decision to be vegetarian or meat eating given the suffering of food animals in American society?
- c. Why do people believe that it's okay to eat and treat inhumanely some types of animals, whereas other types of animals that we perceive to be special (those Garner refers to as “sentient” or as having “self-consciousness”) we believe must be treated “humanely”? What is the role of our emotional connection to these animals (e.g., dogs and cats) in this distinction?
- d. Are people who give up meat for ethical reasons (to not cause harm to animals) more sophisticated morally or ethically than people who give up meat for health reasons? Similarly, is there a difference in moral development or ethical sophistication between people who choose to be vegan as opposed to those who choose to be vegetarian?

II. Questions that arose from students' class discussion and reading of R. D. Rosen's (2007) book *A Buffalo in the House*:

- a. Why do some people keep wild or exotic animals as pets instead of typical domesticated animals such as cats or dogs? Do people treat pets differently or relate to them differently when they have a wild animal or exotic pet as opposed to a domesticated animal as a pet?
- b. How are people's attitudes toward hunting affected by their personal experiences with animals (e.g., experiences with hunting or experiences with having pets)?
- c. Why do Americans want to have pets? What role do they play in their lives? How do our relationships with our pets compare to our relationships with the humans in our lives?
- d. Why do people choose to have purebred pets or mixed breed pets? Are pure bred animals valued more? To people who choose purebreds choose them for social status or for characteristics of the breed? Do owners of purebred pets treat them and relate to them in the same way as owners of mixed breed pets?
- e. How do people decide how much medical care to provide for their pets? Does it relate to availability of funds, whether the pet is defined as a member of the family or not, or some other factors?
- f. What is the relationship between loving relationships with animals and health (e.g., do animals heal faster when loved by their owners; can pets improve the health of their pet owners, can therapy dogs improve the health of those they serve)?

Appendix B: Students' Research Question and Interview Question Worksheet

Instructions: Based on our research question (shown below), discuss the possibilities listed for interview questions we should ask our subjects. List any additional ideas for research questions your group comes up with.

Overall question: Why do Americans want to have dogs? What role do they play in their lives? How do our relationships with our dogs compare to our relationships with the humans in our lives? In some ways we think of dogs as animals, and in some ways as human, or humanlike. How do our beliefs about animals' nature affect how

we interact with them and interpret their behavior?

a. What role do dogs play in our lives? Can they function as a support system, e.g. helping us cope with particularly upsetting or challenging times in our lives? Do they help us cope with the minor stresses of day to day life? When we are apart from our dogs, e.g., when traveling, or being away at school instead of at home, to what extent do we miss our dogs and experience the lack of the support they routinely give us?

b. Do some people view having dogs as a substitute for having children? How do these people treat or relate to their dogs compared to people who see dogs as different from children?

Our Initial Ideas for Interview Questions:

1. Tell the story of how and why your family got your dog/s.
2. What types of activities did you do with your family dog?
3. How did your dog interact with you and your friends and family?
4. Do you plan to have a dog of your own in the future (in the next 5 years? ten years?)
5. How does the cost of pet ownership affect your relationship with your pet or your plans for future pets?

Add additional ideas for research questions here:

6. _____
7. _____
8. _____
9. _____
10. _____

Appendix C: Interview Guide (Created from student questions; edited by instructor)

I. Preparing to Conduct the Interview

Find some one to volunteer to be interviewed who is currently an undergraduate student attending college in the greater Boston area and who lived with a dog in the home for at least part of the time they were growing up. If the interviewee had more than one dog while growing up, ask them to choose one dog to base the interview on.

Before you start the interview, let the interviewee read the consent form, and answer any questions they may have about the research project. After they have signed the consent form, turn on the tape recorders (it's good to have 2 recording devices so you have a back up in case one malfunctions). (Please do a sound check with the tape recorder in advance to make sure you're getting good sound and that the tape recorder is placed closely enough to pick up your interviewee's voice.)

II. Interview Guide:

Remember that you are limited to about 30 minutes of interview time. *You do not need to ask all of the questions on this list.* You can ask follow-up questions that occur to you in response to the interviewee's answers, or ask them to explain things if necessary.

A. Your Family's Dog

1. Tell the story of how and why your family got the dog.
2. What type or breed of dog did your family have? Why did your family choose that particular type of dog?
3. Was your family's dog an indoor dog or an outdoor dog? Was it a family pet or a guard dog?
4. Where did the dog sleep at night? Why did s/he sleep in that location?

B. Your Relationship with your Family's Dog

1. Approximately how much time did you spend with the dog on a typical day? How did that vary at different phases of your life?
2. What types of activities did you do with your family dog? How did your dog interact with you and your friends and family?
3. If you were going on a trip, did your family take the dog with them or not? If you left the dog behind, where did your family leave the dog?
4. Did you participate in the training of the dog, and if so, what was that like?

5. Did having a dog ever limit your activities or prevent you from doing something you wanted?
6. Describe your dog's personality (e.g., friendly, nervous, calm, smart, playful).

C. Emotional Connections

1. Does your dog ever affect your emotional state? If so, explain how. Did your dog miss you when you weren't there? Did you miss him/her?
2. Did your dog know when you were upset or especially happy?
3. What were the positive aspects of having a dog while growing up? What were the negative aspects? (Or, "What did you like most/least about having a dog while growing up?")
4. Did your family dog help you cope with the stresses of every day life, or did it make your life more stressful? Give an example.
5. How is your relationship with your dog similar to or different from that of your relationship with a friend? Do you consider your dog your friend?

D. Future Plans

1. Do you plan to have a dog of your own in the future (in the next 5 years? ten years?) (Why or why not)?
2. If you do get a dog in the future, will it be the same breed/type of dog you had growing up? Why or why not?
3. Did your family buy a lot of toys and treats for the dog? Did the dog receive veterinary care? How does the cost of pet ownership affect your relationship with your pet or your plans for future pets?

E. Wrap up and Close the Interview

1. Make sure you have basic information about the interviewee:
Gender: _____ Year in School: _____ Which School?: _____
How old when got your dog? _____ Was the dog adopted or purchased? _____
2. "Is there any thing that I've left out that you would like to mention?"
3. Thanks and Goodbyes. Offer to give them a copy of the paper when it's finished, if they're interested in seeing it.

Table 1: Pedagogical Survey of Student Reactions to Course and Project
 (Rating scale 1-6; 1 = “not at all”; 6 = “to a great extent”; n = 26)

Questions:	Rating: Number/Percent:	1 # %	2 # %	3 # %	4 # %	5 # %	6 # %	Average rating
Did the assignment to conduct and transcribe an interview improve your understanding of what sociological research is and how it is done?		1 3.8%	0 0%	1 3.8%	1 3.8%	8 30.8%	15 57.7%	5.3
Did conducting the interview help you get ideas for how to understand and analyze the data?		0 0%	1 3.8%	0 0%	7 26.9%	10 38.5%	8 30.8%	4.9
Did reading the interviews that the other students had conducted help you understand what good techniques for interviewing and transcribing look like?		0 0%	1 3.8%	3 11.5%	4 15.4%	8 30.8%	10 38.5%	4.8
Did the group research project improve your understanding of what sociological research is and how it is done?		0 0%	0 0%	2 7.7%	10 38.5%	8 30.8%	6 23.1%	4.7
Did the group research project help you get ideas for how to understand and analyze the data?		0 0%	0 0%	0 0%	9 34.6%	13 50%	4 15.4%	4.9
Did working on the group research project with other students in the class help improve your understanding of collecting and analyzing data and writing up the results of research?		0 0%	0 0%	1 3.8%	8 30.8%	11 42.3%	6 23.1%	4.7

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