10 Steps to a Service-Learning Project for AP Statistics

1. Identifying Partner Organizations:

   For one of the very last assignments of the fall semester I give students the handout "AP Statistics Spring Project Questionnaire." I take time to discuss with them the underlying motivation and general structure of the project, as well as sharing examples of successful projects from previous years (either in my class or that I have come across in different sources). I then ask them to submit a list of preferred community organizations that they wish to partner with for their project and to also indicate which other students they would ideally like to work with.

   I recommend compiling a list of local non-profit organizations for students to choose from but still allowing students a write-in option if an organization is not listed. It is easy to compile such a list through either the local newspaper or a simple google search on non-profits and volunteer opportunities in your city. I have yet to have an organization say "no thank you."

   Keeping it local is important! If the students are going to work with Habitat for Humanity, say, then partner with the local chapter of the organization, not the national entity. The personal interactions and local application of the project results each play a significant role in the students making meaningful connections with the statistics that underlie the project.

2. Assigning Groups:

   The very first day of class in the spring is dedicated to officially assigning the project and revealing which groups students will participate in. I try my best to organize students together based on their requests for the organization with which they wish to partner. A shared passion amongst the group tends to lead to stronger teamwork amongst the group members.

   I use my own discretion in assigning groups based on teammate preferences to ensure that every group does not have one person that carries the entire load and at the same time, every group can produce a quality finished product. I personally find that the two smaller projects[1] students complete in the fall semester give me opportunities beyond time in class to see who works well together.

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[1] The first fall project is a study in response bias in which students work in teams and gain experience in giving surveys, analyzing bias, and producing a statistical poster. The second fall project requires students to work in different teams to analyze data from the Census at School website. The second project gives students experience in working through real world data sets in Microsoft Excel, creating statistical charts and graphs, and developing an effective PowerPoint presentation. In total by the end of the fall the students have given surveys (both good and bad), examined data sets, worked with Excel, and given two different forms of presentations, all with different classmates as partners.

At this point the students receive the following documents:

- “Project Details”
  This document gives a thorough treatment of the entire process of completing a statistical project. A lot of the language (and insight form practicing statisticians) is borrowed from the ASA project competition document “What is a Statistical Project.”

- “Project Checklist”
  I want the students to be well informed on the task they are undertaking, but at the same time it needs to be manageable. I have found this condensed checklist very useful for students in remembering what to do next. (Plus it came out to be 12 steps long, so we have fun with thinking of this document as guiding us through our 12-Step Statistics Program).

- “Project Calendar”
  This gives a basic overview of what is due when. I have also found it useful to include important dates on this calendar that might be specific to your school (such as half-days, holidays, or testing).

- “Project Proposal”
  The first assigned task of the project will be for teams to write a proposal. This document helps to guide them through that process.

- “Project Rubric”
  I find it best to let the students know at the front end how their grade will be determined on the project. The rubric also acts as a helpful guide for the final report in terms of length and formatting.

3. Contacting Organizations:

   Once the students have been assigned groups, they need to determine an organization to partner with. If I have assigned the groups properly then ideally each student in the group will already have the same first choice as to which organization to partner with. There may still be some details to negotiate, but by the end of the first week back to school in the spring I like to have every group set to contact their organization.

   At this point as a teacher I take a big step back from the process. It is the students’ responsibility to contact their organization, arrange meetings, plan out the study, etc. I am of course still in the picture to advise, facilitate and step in directly when needed, but I try to place as much responsibility on them as possible.

   To get them started, I do provide an “Email Template” for them to use for their first contact with their organization. I also require that I am copied on all email correspondence between them and their organization throughout the project.

4. Writing a Proposal:

   The proposal is the first assigned task of the project. After an initial meeting with their partner organization (either in person, over the phone, or in email correspondence) the students then write a proposal for their project that centers around the main question their organization is trying to answer. The "Project Proposal" document gives some more detail but I am basically looking for the who, what, when, where, why, and how of the whole project.

   I require students to get their proposal approved before they can move on to the next phase of their project. This may take several submissions and revision phases and time needs to be allowed for that on the calendar. Though this may result in a fair amount of work upfront, it is worth it to have a solid document that the team and myself as the teacher can continually point back to as a guide.

5. Workdays and Checkpoints:

   Since the design of the project puts much of the onus on the student for keeping themselves on task throughout the project, I find it helpful to use a handful of class days to simply allow them to work on their projects. This gives me an opportunity to check in with each team, see how they are progressing/struggling and offer them feedback and suggestions.

   Theses can also be useful checkpoints. Some years I will use these days to set deadlines such as "the proposal must be approved by this workday," or "you must have data from your survey for this workday," etc.

6. The Written Report:

   This project culminates in a written statistical report. The "Project Rubric" and the last page of the "Project Details" handouts give the students guidance on how to write their reports. I strongly encourage students to treat this stage of the project like a literature class – they should be talking with me through ideas in rough draft format and then refining their work, as opposed to writing everything from the project down the night before. It can be useful to use a final workday with the stipulation that "a first draft of the report must be done prior to the workday." This allows the instructor a chance to look over every teams report prior to a final, official submission.

   "Sample Reports" can also be useful for students as well. Depending on your students' ability to type statistical language it may be useful to provide them with an electronic document with symbols like μ, Σ, $\bar{x}$, χ^2, etc. so they can simply copy and paste needed symbols.

7. Practicing the Presentation:

    After completing the written report, one class day should be devoted to students presenting their results to the class. This provides an opportunity for feedback from the instructor and classmates prior to the students presenting in front of their partner organization.

8. Giving Presentations:

    This is the grand finale, your students standing in front of a community organization to explain how their statistical analysis will benefit them in the service work that they undertake. At the beginning of the project, once every team has been officially partnered with an organization, I contact the organizations in a mass email to thank them and give them several dates toward the end of the semester to put on their calendar for presentations. I try to give them a choice between 2-3 different class days over a week after we have finished covering the material of the course and prior to the AP exam. The organizations are invited to come to the classroom to make scheduling easier, though there have been instances in the past when I had to travel with the students to the organizations' headquarters to give the presentation.

9. Reflection and Feedback:

    I like to take one day after the AP exam is complete for the students to provide me with feedback on the project and to offer them a chance to reflect on the year as a whole. The "Student Reflection and Feedback" document walks students through describing their quantity and quality of work both for themselves and their teammates. It also asks for honest feedback (either positive or negative, nothing neutral) on the project as a whole.

10. Preparations for the Following Year:

    I read through the reflection and feedback forms and make modifications to the project as necessary. Needless to say the current version of the project that I am presenting is not how it looked in its first incarnation. In order for the project to be truly successful it is important that you tailor it to address the needs and situation of your current student. Just making the project service based isn't enough. If the students don't want to do it or don't enjoy doing it, then it becomes just another project.

Thank you for considering using service-learning in your classroom. I hope both you your students gain as much from the process as I and my students have.