

Student Project Groups in Statistics Classes at LSU-Shreveport -- A Four Year Review

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Abstract

Statistics courses have achieved among some students, the reputation of being difficult, useless, and boring, much like mathematics courses. Academic departments have attempted to eliminate the boring factor by using texts with terminology and applications specific to the needs of their students. Thus, in addition to those general statistics courses traditionally offered by mathematics departments, one finds statistics courses for those majoring in engineering, education, psychology, business, health sciences, and agriculture, to name a few, not to mention those courses which have a major statistics component. Regardless of the level of and department in which the statistics course is offered, faculty may want to consider introducing data collection and analysis components to lecture-only courses and thereby help bridge the gap between in-class theory and real-world issues. As a result, students who complete the course will have a greater appreciation of the power and applications of statistics.

The mathematics department at Louisiana State University (LSUS) offers several statistics courses, two of which are offered every term. Early in the term, students are separated into student project groups, each of which elects a captain who is in charge of coordinating the group's work. Although the groups have some flexibility in choosing a project topic, each project should be worthwhile, in that each group's findings should be useful to some segment of the community, whether it be a business, industry, government agency, the students themselves, and in some cases, politicians running for office. Over the past four years, many projects have been completed, and while none have been specifically focused on engineering topics, several could have easily been extended to industrial engineering topics, such as quality control.

In this paper, the following points will be covered: (1) setting up and managing the student statistics project groups, including the reporting of results; (2) examples of past projects; (3) benefits to the students and to the community; and (4) working with the media in the reporting of student's findings.

1. Setting Up and Managing the Student Project Groups

On the first day of class, the students are given an overview of the course in which the topics of data collection and student project groups are discussed. Examples of previous projects, both interesting and uninteresting, are given.

Within the first several weeks, students are assigned to groups of five, either randomly or alphabetically. An exception to this assignment procedure may be considered if one or more students are already involved in a data collection project outside of the statistics class. If so, they may be permitted to work together on this already-established project. Also, an exception may be made if a

single student is involved in a worthy data collection project at work, in which case they may be permitted to use it as their own (non-group) personal class project.

Although attrition rates at LSUS are not as high in the statistics courses as in the lower level mathematics courses, such as College Algebra, group membership problems do arise if a project group loses more than one student. With the loss of one member, student project groups generally adjust easily, but the loss of more than one forces the remaining members to collect significantly more data to achieve the original sample size goal. When appropriate, remaining members can be integrated with another project group if the two groups have the same topic, such as polling on public opinion issues.

After the groups have been established, members meet informally and exchange names, addresses, e-mail addresses, telephone numbers, class and work schedules, and other necessary information. In this initial meeting, they also elect a group captain.

The project group captain's responsibilities include the following: (1) helping the group members reach a consensus on a project topic; (2) constructing a questionnaire or survey if one is appropriate to the project; (3) meeting with the instructor to make corrections in the questionnaire or survey; (4) making certain that each student collects their data in a timely manner; (5) making certain that each student actually collects their reported data; (6) making certain that each group member meets the instructor for purpose of data entry; (7) meeting with the instructor to go over graphs and tables to be produced for the final report; and (8) producing the final report. The overall success of the group and their project depends to some degree on the leadership abilities of the group captain.

One of the greatest obstacles facing the project groups is the difficulty in finding a convenient meeting time. Most LSUS students are employed part-to-full time, with some working considerably more than 40 hours per week. These students traditionally schedule morning classes and leave the campus by 1pm for work. Some prefer to enroll in classes meeting only on Monday, Wednesday, and Friday, or Tuesday and Thursday, in order to schedule more work hours. To further complicate the issue, some students commute a considerable distance to campus, as LSUS draws students from all over northwest Louisiana, east Texas, and southwestern Arkansas. Consequently, a project group meeting may require a 45 minute or longer one-way commute for some students. Typically, these commitments leave time during class as the only convenient opportunity to meet. As a result, approximately two days of class time is lost so that the student project groups can meet.

Perhaps, even more difficult than scheduling a meeting time for all group members is scheduling a meeting time with the project group and the instructor. If such meetings can't be arranged because of conflicting schedules, then the instructor either must meet with subgroups of smaller size or work through the group captain.

In many instances, the topic chosen by the project group requires the construction of a survey or questionnaire. Once the draft questionnaire is submitted, several revisions are usually necessary, as students are not always certain about which questions to ask to obtain the information they want, as well as the most appropriate and efficient ways of wording the questions. Typically, the instructor works with the group captain on the revisions. If the results of the survey may have some impact on public policy, the instructor should discuss the wording of the questions with those involved. The

instructor's involvement in questionnaire construction can be time consuming--seldom less than 30 minutes, and occasionally as much as two hours.

After the group captain, instructor, and group members have agreed upon the questions and wording, the next step depends on whether the survey is to be done in person or by telephone. Often a group wishes to gauge student opinion on a university administrative decision that affects them, such as requiring each student to purchase a parking sticker regardless of whether they drive a car to campus or upgrading the quality of food service on campus. In such cases, group members will frequently contact another one or more of their university instructors in other departments and ask permission to distribute the survey in that class in which the group member is enrolled.

If the survey is to be done by telephone, a randomized list of telephone numbers is preferred. Such a list may be obtained from a media marketing firm, or by actually selecting numbers from the appropriate telephone book. If the questions to be asked pertain to the respondent's preference on a certain issue or candidate for public office, it is usually best to use a randomized list of "likely" registered voters, since the opinion of those who don't vote will not be recorded when the election results are in. Calling randomly selected numbers from the telephone book will result in contacting a higher percentage of not-registered and not-"likely" voters.

For those groups surveying by telephone, a practice session is required of all group members. To save time for the instructor, it is best to have all members of a group present at the same time, but if this is not possible, then the instructor will have to meet with the others individually. In this meeting, the instructor will have several members do a practice telephone interview, not only to estimate how long the interview will last, but also to make any necessary corrections on procedure to be followed by the group members.

As soon as the individual members collect their data, each makes an appointment to come to the instructor's office for data entry. Sometimes, the student's class and work schedules and the instructor's responsibilities are such that it is difficult to arrange a convenient time for data entry, which generally requires a minimum of twenty minutes. Furthermore, the considerable amount of time taken up by the project group members can be a problem for students in the instructor's non-statistics classes as they may have to wait longer than usual to get help in their course.

After each student has entered their data, some simple Frequencies, Descriptives, and Graphs procedures on SPSS 8.0 are run so that they can see the combined group's results at that point.

2. Examples of Past Projects

The topics chosen by student statistics project groups since 1996 have been quite varied and some long forgotten. Only the more memorable ones are listed.

a. To determine if the distribution of political yard signs in residential areas could predict the outcome of an election, students looked at three state senate races, two state house races, and one parish (county) commission race. From the candidate's districts, the students randomly selected streets, drove down those streets, and recorded the number of yard signs favoring each candidate. In five of the six races, the candidate who had placed the most yard signs actually won, and in one of the races, the distribution of yard signs was the same as the distribution of votes for the two candidates.

b. To get an estimate of the percent of those leaving a restroom without hand washing, students stationed themselves in restrooms and noted if hand washing took place. The student project groups looked at differences in percentages of hand washers by gender and use of the building in which the restroom was located (restaurants, university, tractor pulls, and symphony).

c. To get an estimate of the average time until pick up of finished clothing items at dry cleaning establishments, students chose three dry cleaners and randomly selected finished clothing items from the rack and determined the number of days that the item had been ready for pick-up. The arithmetic mean and standard deviation for each establishment was calculated.

d. To get an estimate of average time until delivery of various services at restaurants, students selected local and chain restaurants, timing not only themselves, but also several tables of patrons within easy viewing of their own table.

e. With the cooperation of the Shreveport-Bossier Y2K Preparedness Group, several project groups in the spring 1999 term polled local businesses, engineering firms, and manufacturers to get a feel for their level of preparedness for Y2K.

f. Student project groups have assessed the preference of registered voters on many issues including mayoral candidates, relocating city hall to a downtown site, convention center bond issues, mandatory wearing of uniforms in public schools, the establishment of a regional zoo, and the construction of Wal-Mart Super Centers in existing neighborhoods.

g. Students have polled fellow LSUS students on university issues directly relating to them, including university allocation of tech fees, attitudes of student women on violence towards women by student athletes, parking regulations, campus food service, and student sources for news.

3. Benefits to the Students and to the Community

Prior to the current term, there have been no surveys of student's attitudes regarding the project groups, so evidence of benefits to the students is limited to observations by the instructor and occasional comments from the students, but the following have been noted:

a. Since project groups are usually formed randomly or alphabetically, students are obligated to get to know at least four other persons in the class. If several groups have the same topic, the opportunity to become acquainted with fellow classmates is increased. On some occasions, group members become friends, take notes for members who may have to miss class, and become "study buddies" for exams. This is particularly important in view of the non-traditional nature of the LSUS student.

b. Since students are required to visit the instructor to enter data and discuss their project, the interaction between student and instructor is expanded far beyond the classroom lecture and the occasional visit for help during office hours.

c. In the project groups, students, in consultation with the instructor, will design a simple experiment, decide how the data will be collected, collect the data, and participate in the analysis of the data.

Rather than rely solely on data sets in the text or the typical three-or four-line word problems, students work with data they have collected themselves.

d. Students who elect to do telephone polling generally choose it for one of two reasons -- they are very interested in the issues on which they are polling, or they think they can finish the data collection portion of the project quickly. Regardless of the reason, they become more knowledgeable about issues that concern their community.

The students are not the only ones to benefit from their simple data collection projects, however. Special interest groups, such as those wanting to establish a zoo and city officials wondering about the public's support of a bond issue, have welcomed the findings of the student project groups. Typically, these groups lack the time, manpower, and resources to collect and analyze the data, yet need the information to help them in the decision-making process.

The university will occasionally get some good (and free) media publicity (newspaper, radio, and television) from the project group's work, particularly if the issue is of interest to the community. It is not uncommon for the story to be front page news and to be picked up by one of the wire services and run in other parts of the state. An added benefit here is that those who read these stories will realize that university students are involved in a worthwhile endeavor.

4. Working With the Media in the Reporting of the Student Project Group's Findings

Occasionally the media may be interested in the student's findings, which is understandable, since the results may qualify as "news." Having the media involved adds a new dimension to the activity, one which has advantages and disadvantages.

If a student project group is collecting data for a governmental agency or a special interest group, it is a matter of courtesy that the results be shared with them first and that permission be granted to then offer the findings to the media. This approach allows a little time to plan a response when and if a reporter calls.

Even though the instructor may be directing several project groups with widely varying topics, he/she needs to have basic background information on the topic in the event of an interview by a reporter. In fact, it would be best to anticipate questions that may be asked.

Results from student project groups will not be taken as seriously as results from those who collect and analyze data for a living, and the instructor has to be ever mindful that there is always the possibility that less-than-honest students will attempt to submit phony results. To guard against running a story based on fraudulent data, a reporter may ask to interview some of the students involved, and if telephone polling was involved, actually contact some of the same persons the student called to verify that the survey took place.

If there is a chance a news story will be made of the results, it is a good idea to have available tables, graphs, a list of the survey questions, names of students in the project group, and anything else which will make the reporters work easier and facilitate accurate reporting of the results. It is also important to stress that the students did the data collection, not the instructor.

Summary

Student project groups have been used in most statistics classes taught in the Department of Mathematics at LSUS since 1996. Initially, the idea was to augment the typical lecture and class room activities with simple real world data collection and analysis projects. At first, little formal structure was imposed on the students in terms of deadlines, topics, and standardization of procedures. In the last one and one-half years, however, there has been considerable fine-tuning of the student project groups concept with improvements coming each term. Students are now required to choose a worthwhile topic (as agreed on by the instructor and the student), meet deadlines for collection and data entry, and meet to go over procedures for data collection. As a result, students see first hand how data is collected and understand how it can influence decision-making processes. In other words, they have a link between classroom instruction and the real world.

Written student feedback on the student project groups was requested for the first time in the fall 1999 term and for the most part, comments were favorable. Students enjoyed working in groups and, for those who were involved in polling projects, enjoyed having their work used and appreciated by the special interest groups which the polling benefited. Students also gave suggestions on how to improve the workings of the project groups in the future, some of which have already been implemented with the spring 2000 term classes.

Students enrolled in statistics classes using project groups will have more work to do than those enrolled in a similar class in which project groups are not used, however, the extra work required should amount to no more than that necessary to do a term paper for an English class. On the other hand, the extra work required of the instructor to manage the project groups is considerable, particularly for classes with 25 or more students. Since classes of 40 or more at LSUS are not uncommon, it is conceivable that the instructor would have to manage 8 or more project groups. In addition, if polling for a special interest group requires that the data be collected over a short period of time, say one week or less, there is the added pressure of data entry, report writing, and responding to the media if the topic is of interest to the community.

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Winston Conway Link is an Assistant Professor of Mathematics and former interim chair of the Department of Mathematics at LSU-Shreveport. Conway Link was co-founder of Summer Solstice, a summer enrichment program for high ability elementary school students which ran for 12 years. He received a masters in mathematics from the University of Oklahoma and did further graduate work in Biostatistics and Epidemiology at the University of Oklahoma Health Science Center.

Four LSU Students Nominated for 2019 Prestigious Udall Scholarship. LSU has nominated four students to compete for the prestigious Udall Scholarship. The Udall Foundation awards scholarships to college sophomores and juniors for leadership, public service, and commitment to issues related to Native American nations or to the environment.Â Public Relations Student Society of America at LSU received first place in the National Organ Donor Awareness Competition at the PRSSA National Conference, which took place from Oct. 21 to Oct. 25 in Indianapolis, Indiana.Â Atianna Cordova, a third-year undergraduate student enrolled in the LSU School of Architecture, is the first LSU architecture student to be named a Ronald E. McNair Research Scholar. 2013. Louisiana State University Shreveport (LSU Shreveport or LSUS) is a branch institution of the Louisiana State University System located in Shreveport, Louisiana, and is accredited by the Southern Association of Colleges and Schools. The school's athletic programs, nicknamed the Pilots, are members of the National Association of Intercollegiate Athletics (NAIA) and the Red River Athletic Conference.Â     What is it like to train at LSU Health Shreveport?     Louisiana State University Shreveport Launches TutorMe.     Welcome to LSU Health Shreveport.     Class of 2019 Orientation.     Student Interview Season.Â Each year, the UC publishes a list of current clubs with the names of the groups according to the nine categories of student organizations. Organizations.