INTRODUCTORY STATISTICS: A COOPERATIVE LEARNING APPROACH

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In many instances students take Introductory Statistics courses to satisfy various graduation requirements, for example to satisfy a mathematics requirement. These students have a fear of mathematics, and as such the desire and motivation to learn statistics on the part of student is very minimal. This paper discusses how cooperative learning was used to improve teaching of the Introductory Statistics course.

INTRODUCTION

The undergraduate students at University of Wisconsin Oshkosh can satisfy the general education requirement in mathematics by taking one of four different courses offered by the mathematics department, one of which is a 3 credit Introduction to Statistics course. During the past few years the numbers of students taking Introductory Statistics course has increased significantly. The majority of the students taking this course are of junior and senior standing. These students have a fear of mathematics and as such they wait until the last moment to take this course. The only reason that these students take the course is to satisfy graduation requirement and hence they are not motivated to study the subject. In the past the course was taught by the traditional way of teaching: lecturing. At the end of one semester it was felt that the traditional approach is not well suited to this group of students. The next semester when the course was taught it was decided to use a cooperative learning approach by incorporating group work and activities into the course.

The current reform activities in statistics education encourages the use of cooperative learning to improve statistics instruction. There is a vast array of literature about the use of cooperative learning in mathematics and MAA Notes # 37 has a bibliography which offers a broad sampling of cooperative learning literature. Garfield (1993), Keeler and Steinhorst (1995) and Giraud (1997) are good sources of reference in the use of cooperative learning techniques in teaching statistics.

COOPERATIVE LEARNING

In using cooperative learning for teaching introductory statistics course the approach used was that small groups of students will work together as a team to achieve a

common goal. The common coal could be an understanding of the text material, solving homework problems, and in class activities.

Garfield (1993) lists several ways groups are formed in cooperative learning. As this was the first time that I was using cooperative learning in any of my courses, I did not use any particular criterion for forming the groups. At the start of the semester it was announced that the students will work in groups of three, and the choice was left to the students to form their own groups. The class was conducted in a room which had 8 large table, each seating three students comfortably. Most of the groups were self formed by the seating arrangement on the first day of class. In reflecting what happened during the semester, I am happy that it was left to the students to form their own groups.

The way the course was structured, about one-half of the class period was to be used to explain new concepts, and the rest of the time was spent on group work. It was also expected that the groups will work together on homework assignment, but individual written solutions were to be submitted. This was to prevent one person in the group doing all the work and the other members taking a free ride.

The same text (Moore,1995) was used during both the semesters. After spending about 20 minutes explaining key concepts, the rest of the class time was spent on group work. On a given day the class room activities consisted of reading the text, understanding the concepts that were introduced at the beginning of the class period, and working on problems as a group. In the past when problems were assigned to work in the class only a handful of students will start working on the problems. With the formation of groups, when problems were assigned to be worked in the class, lengthy and intense discussions could be heard from all the groups. While walking around the classroom, when the groups were engaged in solving the assigned problems, I was able to listen to their on going discussions, and judge from that their understanding of the topic covered that day. The groups were able to complete the problems before the end of the class period. There was a very active participation of all the students in the class activities while in the past the student hardy participated in any classroom activity.

In addition to the problems solved during the class period, two problems form the text were assigned as homework. The groups worked on the homework assignment together and written solution were submitted at the beginning of the next class period. One notable change that was observed from the previous semesters was the way the solutions to homework problems were handed in. In the past when homework

assignments were due, there were few students who would be still working on the problems at the beginning of the next class period, and solution were handed in later. When groups were formed, the students met after class worked together on the problems, and the solution were handed in by all the students at the beginning of the class period. Also almost all of the students were able to do the home work correctly.

CONCLUSION

The use of cooperative learning in the course helped the students learn statistics without any anxiety. The attendance of the students improved a lot compared to the previous semester. The students were willing to participate in class room discussions much more readily than in the past semesters. There was an increase in student-teacher interaction, and the number of office hour usage by the students.

Many instructors are hesitant to use group work, afraid that they will not be able to cover the same amount of topics if group work were not used. I was able to cover the same amount of material in both semesters, and the students understanding of the concepts were greatly increased when group work were used.

In both semesters the course grade was based on home work and three exams given during the semester. The overall performance of the students in the course when cooperative learning techniques were used was much better than in the previous semester.

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