

# **“The Effect of Triangulation Grouping of Students in Understanding Statistics”**

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## **Background of the Study**

Institutions of higher learning across the nation are responding to political, economic, social and technological pressures to be more responsive to students' needs and more concerned about how well students are prepared to assume future societal roles. Faculty are already feeling the pressure to lecture less, to make learning environments more interactive, to integrate technology into the learning experience, and to use collaborative learning strategies when appropriate.

Cooperative Learning is a systematic pedagogical strategy that encourages small groups of students to work together for the achievement of a common goal. The term 'Collaborative Learning' is often used as a synonym for cooperative learning when, in fact, it is a separate strategy that encompasses a broader range of group interactions such as developing learning communities, stimulating student/faculty discussions, and encouraging electronic exchanges (Bruffee, 1993). Both approaches stress the importance of faculty and student involvement in the learning process.

When integrating cooperative or collaborative learning strategies into a course, careful planning and preparation are essential. Understanding how to form groups, ensure positive interdependence, maintain individual accountability, resolve group conflict, develop appropriate assignments and grading criteria, and manage active learning environments are critical to the achievement of a successful cooperative learning experience. Before you begin, you may want to consult several helpful resources which are contained in Appendix N. In addition, the Program in Support of Teaching and Learning can provide faculty with supplementary information and helpful techniques for using cooperative learning or collaborative learning in college classrooms. <http://www.gmu.edu/resources/facstaff/part-time/strategy.html>

Cooperative and collaborative learning are instructional approaches in which students work together in small groups to accomplish a common learning goal. They need to be carefully planned and executed, but they don't require permanently formed groups. <http://pedagogy.merlot.org/TeachingStrategies.html>

Cooperative learning is a specific kind of collaborative learning where students work together in small groups on a structured activity. They are individually accountable for their work, and the work of the group as a whole is also assessed. Cooperative groups work face-to-face and learn to work as a team. Why cooperative and

collaborative learning? Paradigm shift of education CALLS for the departure from the traditional teaching methods which are primarily Teacher Centered into a Student-Centered Learning Environment.

Teachers must use flexible grouping practices to best address the varied needs of students in a heterogeneous classroom. Over the course of a lesson or a unit, successful teachers break from whole-class instruction to require students to work as partners or small groups, making students more actively involved and responsible for their own learning. Hence, the researchers were motivated to conduct an action-research regarding this strategy of teaching.

Triangulation grouping was the term chosen by the researcher to name the kind of grouping done in this research because the grouping of students were made of different students of different level of understanding Statistics. The principle that lies within the term “triangulation grouping” was modeled from the cooperative learning as “a genre of instructional strategies that use small groups of students working together on learning tasks, stressing support for one another rather than competition.” (Kellough, 2006) The task given for the 2 members of the group, the average and the above average students is to work together to support the below average student in explaining further the lesson taught for that day so that no one would be left behind when the class advance to the next topic.

The advantages of heterogeneous grouping at the classroom level are numerous. First, they provide settings where people from different backgrounds, classes, gender, ethnicities, culture, and achievement levels can learn to work together in a mutually beneficial environment. Secondly, they allow for students to learn from each other's strengths and weaknesses. Third, they allow students to share “across their differences,” enriching the experience. Fourth, they allow students to learn about each other, shared interests, and shared concerns. Fifth, and perhaps the most important for a social studies teacher, is that they prepare students to be part of a diverse, democratic society. (Singer, 2007)

In Triangulation grouping, the below average students will no longer feel separated and stigmatized. It will also prevent them the feeling of being trapped in the “stupid group” of students unwilling to learn. In the same manner above average students will have the opportunity to use their advantage in helping others out of a stupid situation of not understanding the lesson. They will learn to value other students. The strong will always look for the weak and the weak will do well just the same to return the favor given to them.

Division among the students is prevented if we equip our students to live, work, and play with people who are “different” from them.

Through the study, the researcher hopes to find that triangulation grouping would be the conduit that the below average student need to develop new concept and express strong understanding in Statistics.

In this study the researcher investigates how triangulation grouping helped below average students cope up in their understanding Statistics concept. Triangulation grouping was composed of one below average student, average student and above average student.

Understanding Statistics can be defined as having comprehension on the lessons learned in Statistics with the ability to explain the concept of the matter in oral or in paper form.

Statistics as a discipline requires learners to employ variety of methods of understanding and to translate from one to the other words, tables of numbers, graphs, equations, diagrams and relationship of variables.

In the researchers' years of teaching Statistics, no students when asked about their perceptions in Statistics that they will say "Statistics is not a difficult subject". Many students think and say "Statistics is difficult". Since this is the way they think Statistics is all about, then it affects their performance in the subject. Students view about a course influence their understanding and learning of that course.

The subject is considered already as difficult, what makes it even more difficult is the students' notion of the subject. Teachers in Statistics need to simplify the concept in a way that it can be understood by students. In so doing, it will help the student at least like if not love the subject.

Heterogeneous sectioning is done at Lorma Colleges; this kind of grouping was mostly the preferred set up in the school so as to encourage below average students to be challenged to study harder and be influenced by the above average students with their method of learning.

Heterogeneous grouping accordingly refers to a grouping arrangement in which whole classes of students of varying intellectual abilities learn together on one group. This is supposed to be the objective of the school in opting for this kind of grouping, unfortunately, every student in the school just works for their own and doesn't mind anybody in the classroom, most of them sees everybody as competitor. The below average students are still far left behind in their understanding of the different concepts in Statistics while the average and above average students zoom up in every activity given. Slowing down the discussion for the below average students will lead the average and above average students to be bored in the lesson. The below average students need to be directly tutored before they can grasp the whole concept. Doing this will make the teacher have no time for her other obligations and that there is not enough time for most of them to be tutored.

## **Methodology**

To address this problem, the researcher made use of the "triangulation grouping" method, where average and above average students will get involved in enhancing the understanding of below average students in learning Statistics.

The researcher teaches Statistics at Lorma Colleges. The Statistics class of IT1-2 was the target of the study. The section is made up of 45 students. Twenty among them is regarded as below average student.

Triangulation grouping was done to the students in such a way that each group was composed of a below average, average and above average student.

The description of an above average student is; that student with an average grade in Statistics for the preliminary and midterm grading period of 84 and above and that understand the concept right away in one explanation; Average students is that student with an average grade in Statistics for the preliminary and midterm grading period of 77-83 and understands Statistics concepts right away for not so hard concept and twice for hard concept; below average student is that student with an average grade in Statistics for the preliminary and midterm grading period of 76 and below and understands concepts in Statistics after two explanation for not so hard concepts and thrice for hard concept

Hypothesis testing was the scope of discussion on the course of the study. Explanation of the topics was through the use of multimedia presentation. There were also hands on activities in the study.

The task given to the average and above average student was to further explain the discussed lesson to the below average student using a discussion guide 8-10 minutes prior the evaluation (short quiz and or oral testing). This is to further enhance the understanding of the below average student on the topic taught. In that way, not only the below average student is benefited with the discussion but also the average and the above average student because they were given time to further digest what they have understood in the lesson.

Prior and after the study, students are given survey questionnaires to answer with regards to their understanding of Statistics.

Both the *survey questionnaire* is composed of 8 questions answerable with yes or no and dislike or like, but for questions number 3, 4 and 8 for the 1<sup>st</sup> questionnaire and numbers 5 and 7 for the second questionnaire, it's a question on what scores the students most of the time get on their quizzes and recitations.

The following questions were asked before the start of the study period.

#### Start of the Study Period

1. How do you like learning Statistics?
2. Do you have difficulty understanding lessons in Statistics?
3. If yes, how many times do you think lessons are further explained before you understand the lesson?
4. What results do you most of the time receive from your quizzes in Statistics?
5. Do you have difficulty in answering questions/problems given in Statistics?
6. If yes, do you need further elaboration of the questions or problems being ask in Statistics?
7. Do you have difficulty expressing yourself during oral recitations in Statistics?
8. What results do you most of the time receive from your recitations in Statistics?

The following questions were asked at the end of the study period.

#### End of the Study Period

1. How do you like learning Statistics now that triangulation grouping is done?
2. Do you think mentoring relationship can help in understanding lessons in

Statistics?

3. Did you have difficulty understanding lessons in Statistics when someone had explained further the lesson already?
4. Did you have difficulty answering questions/problems given in Statistics when someone had explained further the lesson already?
5. What results do you most of the time receive from your quizzes in Statistics when triangulation grouping was done?
6. Where you able to express your answer during oral recitations better when someone had explained further the lesson?
7. What results do you most of the time receive from your recitations in Statistics when Triangulation grouping was done?
8. Do you like that triangulation grouping be a part of your learning process in Statistics?

All the answers were plotted in tables and were analyzed as to how many affirmative answers and negative answers are there. An affirmative answer of yes confirmed difficulty in understanding lessons in Statistics and negative answers of no confirmed no difficulty in understanding Statistics.

A record of the previous results on quizzes, recitations and experiments of the below average students, prior the conduct of the study was compared to the results on quizzes, recitations and activities of the students after the conduct of the study.

Data were generated by comparing understanding of students towards learning *Statistics before the study period*, and *after the study period*.

## **Results and Discussion**

Teacher's and tutors' (above average student) observation on the attitude of the below average students was regarded in this research during the study process. The following attitudes were observed by the teacher: If the below average students 1) Listens to the teacher when lessons are presented 2) Listens to their tutors during the 10 minutes discussion prior the evaluation, and 3) participates in the group activities and experimentations

The following attitudes were observed by the tutors (Above average) during the 10 minutes group discussion before an evaluation is given : If the below average students 1) Listens to their tutors during discussion, 2) Ask questions during the discussion 3) participates in the group activities and experimentations and 4) Gives his/her ideas or comments about the discussed lesson.

The teacher and the tutor's observation served as descriptive information that supports the data provided by the first and second research instruments used in the study.

The researchers observed that the students during the study, especially the above average students were enjoying their task as tutors to the below average students. The below average students in the other hand showed gratefulness of the new groupings that was introduced to them.

On the 1<sup>st</sup> week of the study 4 among the above average students showed no interest about the task given to them specially that they don't like the students assigned to them in their group, but after some conversation with them of the significance of their role in the study, they were able to participate well, even stated on the 2<sup>nd</sup> week of the study that they were able to understand the lesson more when they were given the responsibility to further explain the topic to their group. On the other hand, 6 among the below average students were observed to be aloof and uncomfortable that they were grouped with classmates which is not their peer, especially with above average and an average student. Some revisions were made in the grouping to solve the problem. On the 2<sup>nd</sup> week of the study each of the group was observed to be working as a team except for 2 below average students who continuously pretends to be cooperating but in reality doesn't mind anything that was said.

Concern with one another is very much visible during the study that each member of the group helped when one is being hard up with the task given in the activities. Patience was also observed to be developed in each group that when the below average student cannot understand yet the topic, the 2 other member of the group does their best to still explain further the lesson. Almost every below average student listened to their tutors, give comments during discussion and ask questions to their tutors when they don't understand something.

Independence was also seen among them, there was no copying of answers during the study, only inquiry, they just asked if the process they are doing is in the right track..

The pre and post survey questionnaire answered by the 15 below average students showed an increased in the level of understanding lessons in Statistics. In the pre study survey 100% of the students showed difficulty in understanding lessons in Statistics while the post study survey showed 33% difficulty in understanding lessons in Statistics.

Prior the study period, when students were asked if they have difficulty understanding lessons in Statistics, all of the 15 below average students affirms their difficulty. Because of this all of them confirm difficulty in answering problems and questions given in Statistics further adding that during oral recitations, they have difficulty expressing themselves. When asked if they need further elaboration of the questions or problems being asked in Statistics before they can understand what is being asked, all of them affirmed yes, and when asked how many times do they think lessons are further explained before they can understand the topic, 87% among them stated twice and 13% thrice.

Prior the conduct of the study, quizzes of the 15 below average students showed 0% passing score while in the post study, 75% among the students passed their quizzes. With regards to the student's recitation rate, prior the study period, 20% among them only had the passing rate while in the post study period, 80% of the student obtained passing rate. Record of the previous results on experiments done by the below average students, prior the conduct of the study showed 6% passing rate while in the post study, 80% of the students passed all their experiments.

The target of the researcher, which is for the students to obtain a 100% passing rate in all their quizzes, recitation and experiments was not realized.

When asked if the students wanted that triangulation grouping be part of their learning process in Statistics, 93% responded yes and 6% no. When the 6% student were asked of their reason for not wanting triangulation grouping to be part of their learning in Statistics, they cannot give any reason.

## References

Kellough, Richard D. Secondary School Teaching: A Guide to Methods and Resources, 3<sup>rd</sup> ed., Calif.; Pearson, 2006.

Singer-Nourie, Sharon. Quantum Teaching: Orchestrating Student Success. New York: Singer Learning, 2007.

<http://www.gmu.edu/resources/facstaff/part-time/strategy.html>

<http://pedagogy.merlot.org/TeachingStrategies.html>