



GRADUATE SCHOOL

**A COMPARISON OF THE LEARNING OUTCOMES USING THE
COOPERATIVE, THE COMPETITIVE, THE INDIVIDUALISTIC
AND LECTURE STRATEGIES IN THE TEACHING
OF COLLEGE ALGEBRA**

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Edna T. Mercado

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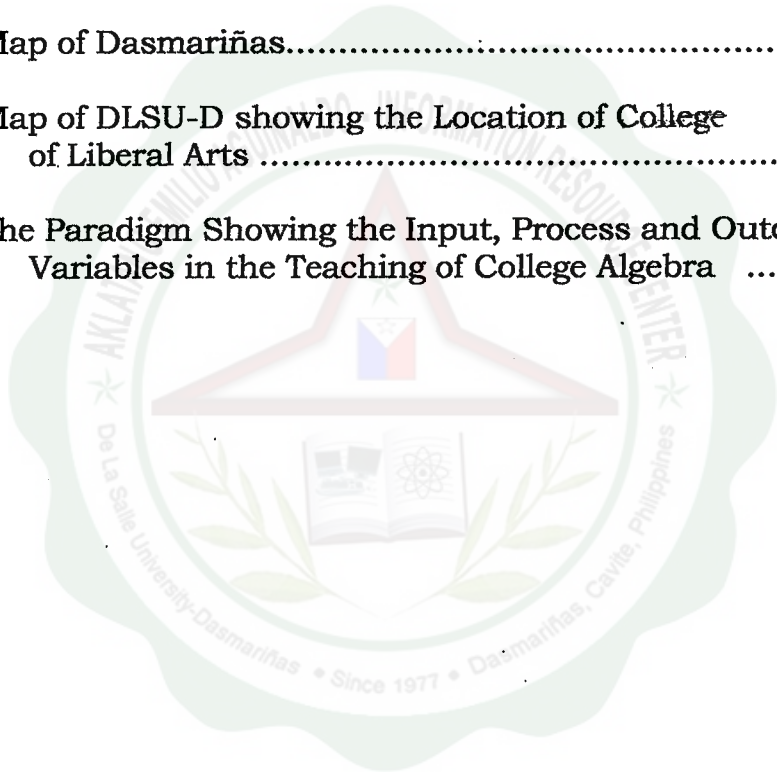


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CHAPTER 1

The Problem and Its Background

Introduction

Mathematics is one of the important components in science and technology. It has been said that Mathematics is the tool of Science. Its role in nation's development cannot be undermined.

Learning mathematics requires certain conditions for it to be learned easily and effectively. Without these favorable preconditioning factors, learning of mathematics is hampered. This is the reason why many students have problems in learning mathematics particularly in College Algebra. It has been the problem of Mathematics teachers to encounter students who have developed negative attitudes towards Mathematics. Many students, be it in elementary school, high school and even in the college level finds Mathematics difficult to understand. Santiago pointed out that various problems were encountered by freshman students in College Algebra. She added that a number of professors in college mathematics share the same observation. School records examined revealed that Algebra had the most number of students with failing grade. She also said that in many class activities, some students performed poorly and has little or no interest in the lesson." 1



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Teachers are now faced and often complain of the student's low achievement in mathematics. Despite the assertion of progressive outlooks and injections of a number of innovations in the teaching of mathematics, still incidences of low achievement and failures among students can be observed.

Students' poor achievements in Mathematics usually generate mixed reactions among the people concerned and oftentimes pass the blame to other sector. Needless to say, teacher, students, principals, supervisors and even parents do significant roles in bringing about educational setting which promotes optimum students' performance.² However, teachers are the main targets of criticism whenever the school system fails to meet the objective of education. They are always blamed for the kind of education the students display. They are always branded as the culprits for low academic achievement and underachievement of the students. The teachers on their part, need to find out why the students are underachieving, identify the factors that affect students' performance and determine which factors affect students' performance and determine which ones can be manipulated in order to enhance the desired level of achievement.

As educators, tasked to be the shapers of the young minds, it is imperative that they do their share in upgrading the products to prepare



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for the challenges of the coming millennium. The researcher believes that there must be a need to research on various ways that may improve teaching methodologies so as to help students attain their maximum potentials. According to Samson, "The true function of college teaching is to provide the best stimuli so that the best learning may take place."³ Teachers have to provide better stimuli so that students may arrive at better and appropriate responses.

With the fast-paced changing economy, now shifting and geared towards information-based and high technology management, varied methodologies strategies in teaching must be introduced and developed in the schools, along with traditional role of providing the students with the basic skills and information. Learning requires active participation of the learner in the learning process. The learner must be aggressively involved in acquiring knowledge. The students should not only be treated as vessels into which teachers pour their knowledge but they must be given opportunities to think on their own, device ways to solve problems and be responsible for the results. Teachers should be facilitators of learning, always around to direct the teaching-learning process so that students may develop the necessary skills and attitudes.

Teacher of mathematics must find a way to develop student's positive attitude towards the subject. For success in the field of



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mathematics, students must be able to speak the language of algebra. Students should be convinced that mathematics is very much useful in the technological environment and that it is worthy of the most serious study. ⁴⁵

For many years various methods of teaching mathematics have been investigated. While some researchers have examined classroom organization, others have turned their attention to content or instruction. The search continues for better ways of teaching and learning.

The consideration of methods of educating students in mathematics demands a certain fundamental vigor if one has to weigh things properly. Some teachers have begun to experiment with methods of teaching. They are convinced that doing so would help them understand differences better and would help them provide those differences, thereby proposing and designing innovations that may help improve mathematics learning.

Teaching to be effective requires a lot of time, talent, and effort from anyone who wants to pursue this inspiring and very fulfilling task. Effective teaching is only possible if teachers would consider the understanding of the complexity of classroom teaching and learn to develop strategies that will enable them to continually evaluate and improve teaching- learning effectiveness. ⁷⁶



Various techniques used to increase the students acquisition, comprehension, and retention of subject matter have been suggested, some of which are cooperative learning, computer-assisted instruction, team teaching. Peer tutoring, competitive, individualistic and practice-and drill. Benefits on the use of these methods cannot be underestimated. Teachers need to analyze carefully the process of selecting the appropriate and effective teaching method that may ensure positive transfer of learning.

Many studies were made on the effectiveness of developed instructional programs and other teaching strategies but less has been done locally on the comparison of learning outcomes when students were taught using competitive, individualistic and cooperative learning. These pronouncements prompted the researcher to conduct a study on the comparison of the learning outcomes using the cooperative, competitive, individualistic and the lecture strategies in the teaching of College Algebra.

Background of the Study

Throughout the ages mathematics has been integrally involved in the development and advancement of science. Modern nations are undergoing rapid technological changes running parallel to industrialization trends that demand adequate mathematical knowledge



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and skills in order to cope with the changes. The Philippines, which is gradually moving towards the way, the modern nations do would need such skills to keep the nation going.

Although computers, ushered in by technology urge human beings to produce comprehensible data, it is generally believed that no machine can ever take the place of the human brain. Man cannot be replaced by machines, for it is the man that makes the machines that facilitates man's work and activities.

Hence, the focus on mathematics, the tools for all science subjects, is especially on instruction that has become a continuing concern in the educational systems throughout the world. The Philippines is no exception, and that this country has to prepare young minds through effective strategies of mathematics instruction to face the challenges brought about by technological or technical changes.

A review or related literature reveals that during the past decades, tremendous efforts have been made to improve the mathematics curriculum, to make it more relevant to present-day needs of the school, the students, their career and responsibilities. Innovations tried here in the Philippines include individualized instruction, introduction of modern mathematics, self - discovery approach, modular instructions, training of mathematics teacher and even changing the curriculum in the



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basic education, are signs of a growing concern on the part of educators to uplift mathematics instruction and consequently, uplift the mathematics achievement of the learners. Most of these innovations are focused on the cognitive development of the individuals.

The difficulties the students encountered in learning mathematics generally focused on three major areas of investigation: conceptual or intellectual consideration, motivation, and the influence of the learning environment. Whereas research tends to focus principally upon the cognitive/ conceptual/ intellectual area in diagnosing student difficulties, the learners themselves stress the overriding importance of the learning environment and its influence upon motivation.

The researcher, having been a teacher of mathematics for seven years, has noted the following observations from other mathematics teachers and students: 1) Generally, students perceive mathematics as a very difficult subject; 2) There are more students failing in mathematics than in other subjects; 3) Students have negative attitude towards mathematics; 4) Mathematics is one of the unpopular subjects in school.

With these observations, there seems to be a critical need to develop instructional strategies that will promote a more positive attitude towards such subject area and increase students' motivation to study, take further courses, enter careers, and learn more about mathematics.



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In exploring and selecting various teaching strategies, a researcher can glean from theories contributed by researches done in mathematics and in some other fields. Reviews of the studies in mathematics reveal that cooperation promotes higher achievement in mathematics than having students work competitively or individualistically. This is especially true if the task is something more than simple drill- review."⁷

Mathematics that is useful to the individual is mathematics that has been developed as a personal construct and developed through involvement. It is knowledge that is usable in dealing with problematic situations in verbal or non-verbal forms. In addition, it is knowledge that can be modeled in drawings, word or symbols."⁸

Setting of the Study

This study was conducted at De La Salle University Dasmariñas, Cavite, one of the member schools of the DLSU-System managed by the Brothers of the Christian Schools, a catholic religious congregation founded by Saint John Baptist De La Salle. Guided by the Lasallian values of Religio, Mores, and Cultura, the university envisions itself as the leader in the CALABARZON area by forming christian achievers for God and country.

As a dynamic partner in the development of the region, the university serves as a wellspring of competent manpower that



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contributes significantly to the industrial growth of the area. By offering excellent and relevant academic programs, implementing outreach program that serves the poor and undertaking research focusing on Cavite history and culture, the university produces professionals who are competitive locally, nationally, and globally.

Through networking with member institutions of the system, government and non-government agencies, provisions for upgraded instructional facilities and equipment, adoption of innovative and participative management style, and formation of committed professionals, faculty, and staff, the university participates meaningfully in the process of social transformation.

De La Salle University is a 27- hectare lot located at Dasmariñas Bagong Bayan, Dasmariñas, Cavite (see Figures 1, 2, 3,4). The University has a total of 356 faculty members and a student population of more than 8,000. The buildings on campus are located within two geographical areas. The East campus is occupied by the College of Education, Law Enforcement and Public Safety, Liberal Arts and Sciences. The bookstore, different laboratories, chapel and the Aklatang Emilio Aguinaldo are also located here. Situated in the West Campus,



600 meters away from the East Campus are the Colleges of Business Administration, Technology, the condominiums, dormitories, and the canteen.

Theoretical Framework

Cooperative learning is grounded on the theory of cooperation and competition by Norton Deutsch. This is based on Levin's field theory which states that it is the drive for goal accomplishment that motivates cooperative, competitive, and individualistic behavior.

Deutsch, in his theory of how the tension system of different people may be interrelated or conceptualized, enumerated three types of goal structures: cooperative, competitive, and individualistic.

A cooperative social situation is one in which the goals of the separate individuals are so linked together that there is a positive correlation among their goal attainment. An individual can reach his/her goal if the other participants can obtain their goals. Thus a person seeks an outcome that is beneficial to all those whom he or she is cooperatively linked. In a competitive situation the goal of the separate individuals are so linked that there is a negative correlation among their goal attainments. An individual can attain his or her goal if and only the other participants can attain goals. Thus a person seeks an outcome that is personally beneficial but is detrimental to the others with whom he or