Student Teams-Achievement Divisions (STAD) Technique On Academic Achievement

Lucila G. Aragon
Mandile Elementary School
Department of Education
Zone 3, Mandile, San Miguel, Bulacan, Phillipines
lucila.gutierrez@deped.gov.ph

***Abstract*— Abstract— This study determined the Student Teams-Achievement Divisions (STAD) technique on academic achievement of Grade VI pupils of Mandile Elementary School for the fourth grading period of school year 2016-2017. Using the mixed methods of research with 62 pupils as respondents of the study, findings showed that: the Science performances of the pupils in the pretests for STAD and traditional method of teaching were below average. After the experiment, posttests for STAD and traditional method of teaching Science were described as above average and average, respectively. On the conducted interview, almost all pupils preferred the STAD in teaching Science. Based on the findings of the study, the following conclusions were drawn: There is a significant difference between the pupils' academic achievement in pretest and posttest when they were exposed to Student Teams-Achievement Divisions (STAD) and traditional method of teaching. STAD was found effective in teaching Science. In the same view, traditional method was found effective in teaching Science. There is a significant difference between pupils' academic achievement in learning Science when they were exposed to Student Teams-Achievement Divisions (STAD) and traditional method of teaching. STAD was found more effective than the traditional method of teaching.**

Keywords*— *academic achievement, student teams-achievement division, learning, performance, traditional, strategy

Introduction

In the creation of learning today, enlightening the quality of learning in both the mastery of the material and teaching methods are always taught. One of the teachers' efforts is improving the quality of learning that is in the preparation of a wide range of scenarios in the classroom learning activities.

For the individual to provide the best response to the issues faced with scientific and technological literacy is important in terms of finding a balance between the individual and the society, and meeting the requirements. Countries where the field of Science and Technology has thoroughly developed, attach great importance to Science and Technology in their education system. The first phase of Science and Technology in education is Science and Technology courses in elementary school, and thus, clearly reveals the importance of Science and Technology courses (Sorgo and Kocijancic, 2011).

Academic achievement is something that is accomplished effectively by pupils as a result of their efforts in learning things in school. Supervising them to achieve something good is a challenging role of an educator. But sometimes, pupils failed to achieve something that is expected to them. Using a variety of learning activities and techniques are necessary to develop their understanding of a subject.

A science-centered curriculum aims to encourage students to understand how science works and to become motivated learners who want to actively engage in Science. At the same time, it directs the learners to mental based discoveries forcing them to think. At the elementary school stage especially, the methods used in teaching should make Science more meaningful for the students. In a classroom environment where the students start to discover the real world through scientific experiences, the ideas are organized and verified through oral and verbal communications (Avard, 2009).

In such an environment, the students will start loving Science, develop positive feelings, and improve their internal motivations. Moreover, this environment can contribute to these students building general scientific schemes, thus the continuity of belief and attitudes can be ensured for stability (Jalil, et al., 2009).

Cooperative Learning as an educational approach is basically a type of classroom organization in which pupils work harmoniously in groups or as a team to help each other acquire academic knowledge and information through democratic procedures and practices as explained by Zulueta (2006). With this, STAD under cooperative learning approach is putting children in work groups and assuring them that even if they have different backgrounds, different abilities and experiences, in working together is productive ways.

The essential to improve pupils' achievement may be realized through effective instructional strategies. Science teachers should facilitate the intellectual,

personal and social development of their pupils. They should be aware of the importance of the learners in teaching situation so as to understand how they learn and so that they could help them learn concepts.

In all education levels, there are factors impacting the success and attitude of the student (Komiya, et al., 2008). Many different scientific reports have recorded that students get negative messages regarding Science all throughout their school lives. In fact, as far as this belief goes, most teachers responsible for Science and Technology classes at lower levels have the same belief as "Understanding Science requires certain ability and only some people have this ability." Thus, facing the reality of Science creates anxiety for most students (Malow, 2006).

Learning is a blend of activities, teachers do the teaching and students do the learning. In the learning activities, interactions between students with students, interaction between teachers and students, and interaction between students with learning resources. It is expected that these interactions, students can actively construct knowledge, in an interactive, inspiring, fun and challenging environment and motivate learners to achieve the expected competencies.

The situations in the classroom need to be planned and constructed in such a way that students get the opportunity to interact with each other. This interaction will form a community that allows them to understand the process of learning and understanding. Hopefully, teachers can create learning situations so that students can work in teams and to develop insights about cooperative learning. Through cooperative learning, teachers are expected to be more effective in managing the classroom. Cooperative learning is very diverse types, one of which is the Student Teams Achievement Division (STAD).

STAD (Students Teams-Achievement Divisions) according to Rai (2007) is one of the many strategies in cooperative learning, which helps promote collaboration and self-regulating learning skills. The reason for the selection of STAD is good interaction among students, improve positive attitude towards subject, better self-esteem, increased interpersonal skills. STAD also adds an extra source of learning within the groups because some high achievers act as a role of tutor, which result in high achievements.

The value of learning that the educators provide to learner is highly reliant on what educators do in the classroom. Therefore, in preparing the pupils of today to become successful individuals of tomorrow, Science teachers need to ensure that their way of teaching is effective. Teachers should have the knowledge of how pupils learn Science. Altering the way to teach and what to teach in Science is a continuing professional concern. Hard work should be taken now to direct the presentation of Science lessons away from the traditional methods to a more pupil-centered approach.

In lieu of these, the researcher attempted to find out if the Student Teams- Achievement Divisions (STAD) has significant effect on pupils academic achievement in Science.

Statement of the Problem

The main problem of the study was to determine the effect of Student Teams- Achievement Divisions (STAD) technique in teaching Science on academic achievement of Grade VI pupils of Mandile Elementary School for the fourth grading period of the school year 2016-2017.

Specifically, the study sought to answer the following questions:

1. How may the academic achievement of Grade VI pupils be described in terms of pretest and posttest before and after exposing them to Student Teams-Achievement Divisions (STAD) and traditional method of teaching?

2. Is there a significant difference between the pupils' academic achievement in pretest and posttest before and after exposing them to Student Teams-Achievement Divisions (STAD) and traditional method of teaching?

3. Is there a significant difference among the pupils' academic achievements in Science when they were exposed to Student-Teams-Achievement Divisions (STAD)?

4. What are the perceptions and attitudes of the pupils with regard to the effectiveness of using Student Teams-Achievement Divisions (STAD) technique?

Hypothesis

This study was guided by these hypotheses:

1. There is no significant difference between the pupils' academic achievement in pre-test and posttest when they were exposed to Student Teams-Achievement Divisions (STAD) and traditional method of teaching Science.

2. There is no significant difference between the pupils' academic achievements in learning Science when they were exposed to Student Teams-Achievement Divisions (STAD) and traditional method of teaching.

Conceptual Framework

As an elementary classroom teacher for almost five years, the researcher was very much aware that there were pupils who struggled in Science in each grade

level. Pupils' skills fall behind what is expected from them. This mostly affects pupils' intellectual development.

Traditional teaching method exists in most classrooms today. In this setting, pupils strive against one another for individual rewards. Instructional activities are characterized by a race to decide the best and brightest pupils. Pupils are ranked according to their individual achievements. In this way, active pupils are given high grades and those with poor performance are classified as failures. These situations turn out those pupils with learning problems and are given low status. It will lessen their interests for learning and even discouraged to attend class.

STAD stands for Student Teams-Achievement Divisions, it is a collaborative learning strategy in which small groups of learners with different levels of ability work together to accomplish a shared learning goal. It was devised by Robert Slavin and his associates at Johns Hopkins University (Innovative Learning, 2009), students are assigned to four or five member learning teams that are mixed in performance level, gender, and ethnicity. The teacher presents a lesson, and then students work together within their teams to make sure that all team members have mastered the lesson. The STAD method is most appropriate for teaching well-defined objectives with single right answers, such as mathematical computations and applications, language usage and mechanics, geography and map skills, and science facts and concepts. However, it can easily be adapted for use with less well-defined objectives by incorporating more open- ended assessments, such as essays or performances (Adesoji and Ibraheem, 2009).

In term of learning achievement using the STAD, a study of Keramati (2009), entitled "The Effect of Cooperative Learning on Academic Achievement of Physics Course," it is found that experimental group students taught by cooperative learning (STAD technique) are more successful than control group students. At this point, it is found that cooperative learning increased academic achievement of students to a higher level when compared to conventional teaching method.

As stated to Discovery Learning Theory cited by Dean and Kuhn (2006), discovery learning is a method of inquiry-based instruction, a theory believes that it is best for learners to discover facts and relationships for themselves. It is considered a constructivist based approach to education. In line with this, the role and expectations of the pupils are transformed. STAD under constructivist theory, the emphasis is not on the amount of content that a pupil manages to retain, but is on the manner in which the students learn, or constructs knowledge with their groups.

Cooperative groups, according to Garcia (2005), can be used in almost all learning areas in the curriculum. Teachers may divide students into long-term cooperative groups, pairs or small groups of students who sit near each other and assist each other in all subject areas. They may also create cooperative groups for a single purpose only changing the membership of groups for each new project or activity.

STAD can be applied to a wide range of situations. Although STAD is not a comprehensive teaching method, it can be administered to organize classes which can turn precipitate the success of all students. The major principle behind this approach is that learners cooperate to learn and be held accountable with respect to their teammates and their own achievements.

Jardeleza (2008) focused his study on Selected Strategies in Cooperative Learning Approach in Developing English Language Skills. Results of the study revealed that one of the strategies the he used which is Student Teams-Achievement Divisions (STAD) contributed in developing the English language skills of the pupils.

This technique can also increase students' self-esteem and motivate the students to learn more. Slavin (2005) finds that students in STAD class think that their success does not depend on their luck but depends on how they work. The students are also intrinsically motivated to do their best.

The quality of education that teachers provide to student is highly dependent upon what teachers do in the classroom. Thus, in preparing the students of today to become successful individuals of tomorrow, Science teachers need to ensure that their teaching is effective. Teachers should have the knowledge of how students learn Science and how to teach it best. Changing the way to teach and what to teach in Science is a continuing professional concern. Efforts should be taken now to direct the presentation of Science lessons away from the traditional methods to a more student centered approach.

STAD has received considerable criticism from students, such as that interdependence might have negative effects if participants are unable to find any link between participation and outcome (Johnson and Johnson, 2009). For example, STAD will not have any effect if the participants feel they are detached and ignored during the activity. If the competent groups outperform their peers, the attention received by the better groups may discourage other groups, who run the risk of being marginalized.

Jolliffe (2007) also points out the potential drawbacks STAD might bring teachers, such as its evolutional process, which might confuse practitioners. Teachers, in fact, constantly suffer from an inadequate understanding of the method. They may also receive criticism from more competent students who are slowed down by peers, while less capable students

may feel discriminated against because of their low esteem and achievement.

Without proper peer evaluation, learning within the context of a STAD group becomes stagnant. Based on the experiences of the writer, STAD can be futile when the lesson is not carefully customized and the teacher is not committed, leading to failure or superficial success (McCafferty, et al., 2006).

Social learning theories explains how people learn in social context (learn from each other) and gives information on how teachers can construct active learning communities. Omondi (2014) stated that learning is through interaction and communication with others.

He examined how social environments influence learning and how environment promotes assisted discovery which is helped along by peer collaboration and the arrangement of cooperative learning experiences by teachers while children are responsible to carry out their own investigations. Learning takes place through the interactions students have with their peers, teachers and other experts (Neff, 2014).

Group members realize that each member's efforts benefit not only himself/herself, but all other group members as well. Jacobs (2006) asserts that positive interdependence is a perception among group members that what helps one group member helps all, and what hurts one group member hurts all.

Cooperative learning is a method used by educators can help students develop necessary social skills. Zakaria, Chin and Daud (2010), concluded that, there are positive changes take place when a teacher changes his teaching method towards a more students- centered approach.

The challenge in education today is to effectively teach students of diverse ability and differing rates of learning. Teachers are expected to teach in a way that pupils learn Science concept while acquiring process skills, positive attitudes and values and problem solving skills. A variety of teaching strategies have been advocated for use in Science classroom, ranging from teacher-centered approach to more students-centered one. In the last decade, there is a vast amount of research done on cooperative learning in Science. Cooperative learning is grounded in the belief that learning is most effective when students are actively involved in sharing ideas and work cooperatively to complete academic tasks.

Enlightened by the insights mentioned above, the researcher conceptualized a paradigm patterned after Input-Process-Output Model to illustrate the relationships of the variables used in the study. Student Teams-Achievement Divisions (STAD) considered as a technique of teaching the lesson in Science to encourage the learners to be more participative and provide optimal adaptation of the learner to the learning environment.

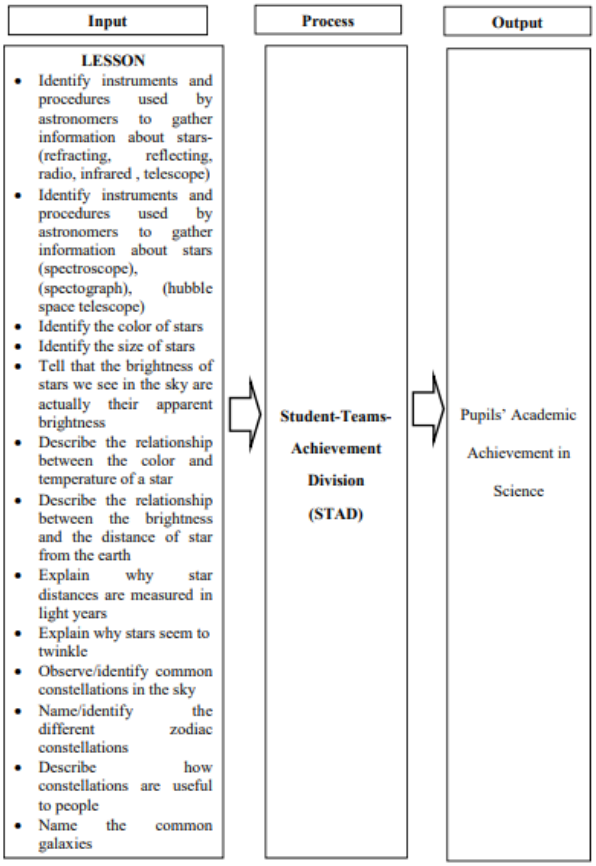

Figure 1. Paradigm of the Study

The paradigm of the study in Figure 1 represents the input-process-output (I-P-O). It shows the schematic diagram that involves collection of qualitative and quantitative data. Each data set was analyzed. Frame 1 of the conceptual model shows the input of the study which consists of lesson in the fourth grading period of Science VI. Frame 2 represents the process which includes the given strategy. Lastly, frame 3 represents the output, which is improved pupils' academic achievement in Science. The result showed the essential use of Student Teams-Achievement Divisions (STAD) that affected the pupil academic performance in learning Science VI.

Significance of the Study

The information from this study is of great value to all educators. It provided information pertaining to a different strategy that could bring positive results into the classroom. The importance of the study is to ascertain the effective and efficient way of teaching using Student Teams-Achievement Divisions (STAD) among Grade VI Mandile Elementary School pupils. Specifically, the results and findings of the study are of great help to the different sectors concerned on education and the learners' development. With these, this study is deemed significant to the following:

School Administrators. The findings of this study may encourage school administrators into giving support or promoting Student Teams-Achievement Divisions (STAD). This may inspire them to encourage the Science teachers to consider the technique in their classroom set-up.

School Science Coordinators. Knowing the effective and efficient ways in teaching using Student Teams-Achievement Divisions (STAD) as based on the performance of the pupils could help other teachers such as those with advisory classes in teaching Science. Through these, the weight of teaching Science to elementary pupils should not only be assigned to the School science coordinators.

Teachers. The teachers will be able to discover the effective and efficient way of teaching using Student Teams-Achievement Divisions (STAD) as based on the performance of the pupils. It would be very beneficial to teachers and Science educators because they will finally know what strategy would be used oftentimes.

Parents. They are considered part of learning agents in education process. For them, this study will enable parents to be more observant in guiding and supervising their children to the instructional program of the school. Knowing the results or outcome of the study will give them a view on what conditions could be provided and predictors for the sake of their children. The education of a child depends not solely on teachers but on his home support system as well.

Learners. This study may contribute for better learning in the educative process. It shows how the academic achievement of the pupils is affected using Student Teams- Achievement Divisions (STAD). The data and other relevant information from this study will lead to develop the strengths and weaknesses of the learners.

Future Researches. Future researchers may use the findings of this research to enlighten other concern educators towards having another related research in the future.

Scope and Limitation of the Study

The study focused on the academic achievement in Science of the Grade VI- pupils of Mandile Elementary School using Student Teams-Achievement Divisions (STAD) technique. This study was limited to pupils' achievements in Science lessons as the teacher utilized the aforementioned technique. The experiment encompassed the technique applied to sixty two (62) pupils of Mandile Elementary School. Location of the Study The study was conducted at Mandile Elementary School (South District) located at Barangay Mandile, San Miguel, Bulacan during the fourth grading period of school year 2016-2017.

Mandile Primary School was built in 1962 with one school building and two classrooms. This school was formerly a rice field. Because some of the residents of this place believed that education was the only wealth that they could give to their children, the school was established.

As years passed, additional teachers and classrooms were added in the said primary school. So, a school building was built in this land for the incoming Grade I, II, III, and IV. To continue their studies, other parents need to send their children to Batasan Elementary School for grade V and VI.

In 1968, Mr. Jose Cayetano donated 5,000 sq.m. of lot in Mandile Primary School. This accommodated the new school buildings built for the children until it became a complete elementary as Mandile Elementary School in 1998.

At present, it is headed by a Principal I and composed of twelve regular permanent teachers, 441 pupils and it has twelve buildings. It is where the researcher currently teaching.

Source: http//:www.google.com.ph

Figure 2. Location Map

Definition of Terms

The following are the terms used in the study including their definitions. These will help the readers to understand the study easily.

Academic Achievement. This pertains to the assessment of knowledge in Grade VI pupils based on their performance in the class.

Learning. This term refers to the process of progressive change of behavior from inability to competence through the acquisition of new or difficult ways of thinking, feeling and doing.

Performance. This pertains to the assessment of knowledge in Grade VI pupils based on Student Teams-Achievement Divisions (STAD) technique.

Posttest. This refers to the 60-item test administered to Grade VI pupils at the end of the experiment to find out what happened to the pupils achievement after exposing them to Student Teams-Achievement Divisions (STAD) and traditional teaching method.

Pretest. This refers to the 60-item test administered to Grade VI pupils in Science before exposing them to Student Teams-Achievement Divisions (STAD) and traditional teaching method to find out the pupils' background knowledge.

Science. This refers to the subject of the researcher study. It means a systematized knowledge in any field, but usually applied to the organization of objectively verifiable sense experience.

Student Teams-Achievement Divisions (STAD). It refers to Student Teams- Achievement Divisions which the technique used by the researcher. The pupils are placed in small groups or teams. It is basically a team work, but pupils are graded individually according to the contribution that they make towards their team. Usually in STAD, pupils are assigned 4 to 5 members in a group that are mixed in performance level, gender and ethnicity.

Traditional Teaching Strategy. This refers to the usual method used by the teachers in teaching Science which usually involves the lecture method and making use of visual aids.

CHAPTER II

METHODOLOGY

This chapter presents the methods and techniques which the researcher utilized in her study. Likewise, it describes the subject of the study, the research design used in conducting the study, instrument used in gathering the pertinent data, the data processing technique and the statistical tools that were applied in the analysis and interpretation of the obtained data.

Research Design

This study focused on the performance of the Grade VI pupils of Mandile Elementary School using the Student Teams-Achievement Divisions (STAD) technique.

The study was conducted using experimental research design in which the Student Teams-Achievement Divisions (STAD) technique served as the independent variable and academic achievements of the pupils were considered as the dependent variable of the study. Pretest and posttest of the control and experimental groups were administered to determine the significant difference of the effect between the two contrasting teaching strategies with regard to the pupils' achievement in Science. According to Enriquez (2011), this method was considered due to the nature of this study where it ascertained the comparative effectiveness of the two teaching strategies – cooperative learning vis-à- vis conventional or non-cooperative learning method.

Narrative report was utilized for the qualitative method of research to determine the insights or perceptions of the pupils on STAD. An interview was conducted to gather information about the pupils' perception on the given technique. The study was centered on the effect of Student Teams-Achievement Divisions (STAD) technique on academic achievement of Grade VI pupils in Science.

Data Gathering Techniques

To conduct this study, a letter of request was sent to the Office of Schools Division Superintendent for approval. Upon the approval of the said office, the researcher asked the permission of the principal of Mandile Elementary School.

The 60-item multiple choice pretest and posttest was utilized to gather the needed data in the study. The researcher set a six-week guide. To ensure that the allotted weeks for application of technique in a total of six weeks were enough and effective to improve and be able to measure pupil's academic achievement, the researcher provided needed materials in the scheduled lessons and activities in Science. A questionnaire for pretest were adapted from Science book Into the Future: Science and Health 6, Building Knowledge in Science and Health 6, and depedtambayanph.blogspot.com.

The pretest was given to determine how much the learners know about their lesson in Science. The result of the pretest served as the basis for assigning the respondents into groups for the technique wherein pupils were distributed and grouped accordingly. Leaders were on rotation basis under the supervision of the classroom teacher. An initial orientation was conducted to the pupils to explain the change of their everyday routine in school. They were allotted one hour for Science subject in the morning for six weeks, which is from 10:30 to11:30 A.M. every day with accompanying timetable.

Pretest and posttest were administered in gathering the data. Pretest was given at the beginning of the class to determine the pupils' baseline knowledge in the lessons One strategy per section of learners was used as class set-up. After the application of the different teaching technique, a posttest was given to the learners to know which class learned more.

Activities were done following a timetable.

Table 1. The Timetable of the Study

COURSE CONTENT	DATE (2017)	TEACHING STRATEGIES	
		Student Teams-Achievement Divisions (STAD)	Traditional Method
WEEK 1 • **PRE TEST** • Identify instruments and procedures used by astronomers to gather information about stars -(refracting, reflecting, radio, infrared , telescope)	February 6, 2017	**PRETEST**	
	February 7, 2017	VI- JP. RIZAL	VI- E. AGUINALDO
	February 8, 2017		
	February 9, 2017		
	February 10, 2017		
WEEK 2 • Identify instruments and procedures used by astronomers to gather information about stars (spectroscope), (spectograph), (hubble space telescope) • Identify the color of stars • Identify the size of stars	February 13, 2017	VI- E. AGUINALDO	VI- JP. RIZAL
	February 14, 2017		
	February 15, 2017		
	February 16, 2017		
	February 17, 2017		
WEEK 3 • Tell that the brightness of stars we see in the sky are actually their apparent brightness • Describe the relationship between the color and temperature of a star • Describe the relationship between the brightness	February 20, 2017	VI- JP. RIZAL	VI- E. AGUINALDO
	February 21, 2017		
	February 22, 2017		
	February 23, 2017		
	February 24, 2017		
and the distance of star from the earth • Explain why star distances are measured in light years • Explain why stars seem to twinkle			
WEEK 4 • Observe / identify common constellations in the sky	February 27, 2017	VI- E. AGUINALDO	VI- JP. RIZAL
	February 28, 2017		
	March 1, 2017		
	March 2, 2017		
	March 3, 2017		
WEEK 5 • Name/identify the different zodiac constellations	March 6, 2017	VI- JP. RIZAL	VI- E. AGUINALDO
	March 7, 2017		
	March 8, 2017		
	March 9, 2017		
	March 10 , 2017		
WEEK 6 • Describe how constellations are useful to people • Name the common galaxies	March 13 , 2017	VI- E. AGUINALDO	VI- JP. RIZAL
	March 14 , 2017		
	March 15 , 2017		
	March 16, 2017	**POSTTEST**	
	March 17, 2017	**INTERVIEW**	

Table 1 presents the time table of the study. It can be seen from the table that the given lessons in six weeks were presented using Student Teams-Achievement Divisions (STAD) and traditional technique. The two sections took turns in using the two techniques on the given weeks.

The switching replications quasi-experimental design is also very strong with respect to internal validity. And, because it allows for two independent implementations of the program, it may enhance external validity or generalizability. It is certainly superior to the simple pre-post nonequivalent groups design. In addition, because it assures that all participants eventually get the program, it is probably one of the most ethically feasible quasi-experiments.

Quasi-experiments are studies that aim to evaluate interventions but do not use randomization. Similar to randomized trials, quasi-experiments aim to demonstrate causality between an intervention and an outcome. Quasi-experimental studies can use both pre intervention and post intervention measurements as well as nonrandomly selected control groups. Quasi-experimental studies encompass a broad range of nonrandomized intervention studies. These designs are frequently used when it is not logistically feasible or ethical to conduct a randomized controlled trial.

As one example of a quasi-experimental study, a hospital introduces a new order- entry system and wishes to study the impact of this intervention on the number of medication-related adverse events before and after the intervention. As another example, an informatics technology group is introducing a pharmacy order-entry system aimed at decreasing pharmacy costs. The intervention is implemented and pharmacy costs before and after the interventions are measured. Harris, et.al (2006).

In the present study, the researcher included the observation and interview after the experiment, which consisted of series of questions considering what the pupils thought about the integration of STAD in Science and how it affected their academic achievement. The interview was held individually that lasted for five minutes to ten minutes. The researcher allotted the fourth grading period in the school year 2016-2017 to conduct the study.

Sampling Procedures

The researcher applied universal sampling or total enumeration in the conduct of the study. The total enrollees of the study composed of 62 pupils with two sections the J.P. Rizal and E. Aguinaldo. The study was conducted in the fourth grading period, school year 2016-2017 at Mandile Elementary School. After the pretest, the pupils were exposed to integration STAD (experimental group) and traditional teaching method (control group), then the posttest was administered. The researcher personally administered the pretest and posttest to the two sections. The score in the pretest and posttest of both sections were tabulated, organized and compared using the various statistical tools.

The researcher made a timetable for the two sections of pupils with the same lesson guide and activity. But each section has two separate schedules. The distribution of the respondents is shown on Table 2.

Table 2. Distribution of Respondents

Section	Number of Respondents
Grade VI – J.P. Rizal	31
Grade VI – E. Aguinaldo	31
TOTAL	62

Data Analysis Scheme

The results from the pretest and posttest of the experimental group were tallied and presented in

tables. The data from how much the learners learn were computed for comparison and analysis.

Descriptive and inferential statistics were utilized to give meaningful interpretations of all the collected data. Range, mean and standard deviation were used to describe the pupil's performance in pretest and posttest.

T-test was employed to determine the effectiveness of the teaching strategies under study

CHAPTER III

RESULTS AND DISCUSSIONS

This chapter presents the analyses and interpretations of all the data gathered in this study in accordance with the problems stated in Chapter I. It determined the effect of Student Teams-Achievement Divisions (STAD) technique on academic achievement of Grade VI pupils of Mandile Elementary School for the fourth grading period of school year 2016-2017.

The Academic Achievement of Grade VI Pupils in Science

The academic achievement of the Grade VI pupil-respondents in the pretest and posttest in Science before and after exposing them to Student Teams-Achievement Divisions (STAD) technique and traditional method of teaching are shown in Table 3 and 4.

Student Teams-Achievement Divisions (STAD)

Student Teams-Achievement Divisions (STAD) is used for meeting well-defined instructional objectives. It is imperative to group the pupils in four to five with a heterogeneous mixture of ability, race, gender and so on. There is a team study that was preceded by a purposeful presentation from the teacher with objectives. The groups must understand and know that their task together was to master the material, not just to be able to fill out a worksheet or test. The goal of the team was that everyone in the group masters the material and help each other.

Table 3 displays the academic achievement of the Grade VI pupils in Science in the pretest and posttest before and after exposing them to Student Teams-Achievement Divisions (STAD) technique.

Table 3. Frequency Distribution and Descriptive Measures of Grade VI Pupils' Academic Achievement in Science before and after Exposing them to Student Teams-Achievement Divisions (STAD) technique

Score	Pretest		Posttest	
	f	%	f	%
48 – 60	0	0.00	29	46.77
36 – 47	5	8.06	30	48.39
24 – 35	15	24.19	3	4.84
12 – 23	42	67.74	0	0.00
0 – 11	0	0.00	0	0.00
Total	62	100	62	100
Range	15 – 36		32 – 60	
Mean	23.61		47.13	
SD	5.79		7.36	

It can be noticed from Table 3 that in the 60-item pretest which was administered before exposing the pupil respondents to Student Teams-Achievement Divisions (STAD) technique, 67.74 percent of the respondents got scores from 12 to 23. Meanwhile, 24.19 percent obtained scores from 24 to 35 and the remaining 8.06 percent registered scores from 36 to 47.

A closer look at the table reveals that the scores of the pupil respondents in the pretest ranged from 15 to 36. The mean was computed at 23.61 while the standard deviation which measures the spread of pupils' scores from the mean was recorded at 5.79 with a verbal description of below average.

Examination of the tabulated findings implied that after exposing the Grade VI pupils to Student Teams-Achievement Divisions (STAD), results showed that 48.39 percent of them registered scores from 36 to 47. On the other hand, 46.77 percent of the respondents got scores that lie within the highest bracket of 48 to 60. Meanwhile, the remaining 4.84 percent registered scores from 24 to 35.

Further examination of the same table reveal that the pupils' scores in the posttest in Science after exposing them to Student Teams-Achievement Divisions (STAD) ranged from 32 to 60. The mean and standard deviation were recorded at 47.13 and 7.36, respectively which were verbally described as above average.

This is related with the studies of Van Wyk (2010) and Bernaus and Gardner (2008) that the experimental group had an increased posttest compared to the control group. The experimental group which was exposed to STAD had a statistically significant increase compared to the control group.

Findings of the present study was not similar with the results of the study conducted by Zenginobuz (2008), he investigated the impact of Cooperative Learning (CL) techniques on the performance of high school seniors. The Student Teams- Achievement Divisions (STAD), a CL technique, was adapted to the specifics of the research. The study adopted the pretest/posttest model with a control group. STAD was applied to the treatment group for 26 class periods. Concurrently with this, the traditional Whole Class Instruction was applied to the control group. The same tests were administered to both groups before and

after the treatment. According to the results, Cooperative Learning had no significant effect on the posttest performances.

In the same view, Iqbal (2010) and Yamarik (2007) acknowledged Student Teams-Achievement Divisions (STAD) as one of the successful techniques that can be applied in the classroom. Cooperative learning has even brought positive results on the students' academic experience compared to the usual traditional teaching method. Moreover, it is believed that cooperative learning is a structured and systematic way of designing activities in a learning environment in which everybody gets to participate. In doing so, students' experiences become rich and valuable.

Results of the conducted interview are in conformity with the present findings. When selected respondents were asked "How do you want the topics in Science be taught?" Almost all respondents replied that they wanted group work activities in Science. Furthermore, they stated that they enjoyed sharing of ideas in group work activities in Science.

Based on the researcher's observation on the pupils in conducting the study, she can say that, it can raise pupils' motivation in learning by exchanging and sharing information, reinforcing each other, giving feedbacks and having sense of responsibility for their tasks in group work through STAD technique. Additionally, STAD technique promoted student centeredness, in which the interactions were not only between teacher- student but also between student-student.

When the respondents were asked about the problems that they encountered in the duration of the experiment, almost all respondents stated that lack of time is one of the problems that they encountered especially in Student Teams-Achievement Divisions (STAD) technique. Moreover, there were some respondents who said that cooperation among the group member was their problem in Student Teams-Achievement Divisions (STAD). They added that there were some members of the group who did not cooperate or participate in the group activities.

Respondents were also asked if they wanted to work alone in doing Science activities. All respondents replied that they do not want to do the activities in Science alone. They further said that working alone is boring.

Traditional Method of Teaching

Traditional teaching, as everyone had experienced, is classroom-based and consists of lectures and direct instructions conducted by the teacher. This teacher-centered method emphasizes learning through the teacher's guidance at all times. Students are expected to listen to lectures and learn from them. Traditional method of teaching is concerned with the teacher being the controller of the learning environment. Power and responsibility are held by the teacher and they play the role of instructor (in the form of lectures) and decision maker (in regards to curriculum content and specific outcomes). They regard students as having 'knowledge holes' that need to be filled with information. In short, the traditional teacher views that it is the teacher that causes learning to occur.

Table 4 exhibits the pretest and posttest on academic achievement of the Grade VI pupil respondents in Science before and after subjecting them to traditional method of teaching.

Table 4. Frequency Distribution and Descriptive Measures of Grade VI Pupils' Academic Achievement in Science before and after Exposing them to Traditional Method of Teaching

Score	Pretest		Posttest	
	f	%	f	%
48 – 60	0	0.00	1	1.61
36 – 47	5	8.06	22	35.48
24 – 35	15	24.19	37	59.68
12 – 23	42	67.74	2	3.23
0 – 11	0	0.00	0	0.00
Total	62	100	62	100
Range	15 – 36		23 – 49	
Mean	23.61		34.18	
SD	5.79		5.76	

It can be noted from Table 4 that in the 60-item pretest, 67.74 percent of the respondents got scores from 12 to 23. On the other hand, 24.19 percent obtained scores from 24 to 35 while the remaining 8.06 percent registered scores from 36 to 47.

Perusal of the same table reveals that the scores of the pupil-respondents in the pretest for the traditional method of teaching Science ranged from 15 to 36 with a mean of 23.61 and standard deviation of 5.79 with a verbal interpretation of below average.

Further perusal of the tabulated findings reveals that after exposing the respondents to traditional method of teaching Science, 59.68 percent of the respondents got scores from 24 to 35. On the other hand, 35.48 percent of the respondents got scores from 36 to 47, 3.23 percent obtained scores from 12 to 23 and the remaining 1.61 percent registered scores that lei within the highest bracket of 48 to 60.

A close examination of the same table shows that the posttest scores of the pupil ranged from 23 to 49 with a mean and standard deviation of 34.18 and 5.76, respectively.

When the respondents were asked about their experiences in the Student Teams- Achievement Divisions (STAD) and in the traditional method of teaching Science majority of the respondents answered that they learned more using the group work activities in STAD. However, there were some respondents who stated that they still preferred the traditional method of teaching. These respondents cited that they appreciated when the teacher is the one

who is giving the information and concepts regarding the topics in Science.

Pupils do not have the chance of expressing their thoughts when using the traditional teaching method. This is what the researcher found out during the implementation of traditional teaching method.

Difference between the Pretest and Posttest Achievement of the Pupils in Student Teams-Achievement Divisions (STAD)

One of the problems raised in the study was to determine the effectiveness of STAD technique and traditional method in teaching Science to Grade VI pupils. To answer this, the pupils' pretest and posttest mean scores in Science for STAD were compared. Likewise, the pretest and posttest mean scores of the pupil respondents in the traditional method of teaching Science were also compared. Using the t-test for dependent samples, it tells the researcher if the difference between two means is larger than what would be expected by chance (i.e. statistically significant). Results of the analysis are presented in Table 5.

Table 5. T-test Analysis on the Differences between Means of Pretests and Posttests

Strategy	Pretest		Posttest		Mean Diff.	t - comp	p-value
	Mean	SD	Mean	SD			
STAD	23.61	5.79	47.13	7.36	-23.52	-19.78**	0.000
Traditional	23.61	5.79	34.18	5.76	-10.57	-10.19**	0.000

Legend: ** = highly significant ($p \leq 0.01$)

As can be gleaned from Table 5, highly significant difference was found between the pretest and posttest results for the STAD technique as manifested by the computed probability value of 0.000. This highly significant difference was brought about by the fact that the computed probability value is smaller than the 0.01 level of significance.

The negative sign of the mean difference came from the difference between the mean of pretest and mean of posttest. Since mean of pretest is less than mean of posttest, the result is negative. If the mean difference is negative, it follows that t-computed is also negative.

A negative t-value simply indicates a reversal in the directionality of the effect, which has no bearing on the significance of the difference between groups. Analysis of a negative t-value requires examination of its absolute value in comparison to the value on a table of t-values and degrees of freedom (which quantifies the variability of the final estimated number). If the absolute value of the experimental t-value is smaller than the value found on the degrees of freedom chart, then the means of the two groups can be said to be significantly different.

These results implied that STAD is effective in teaching Science. This also meant that the academic achievement of the pupil respondents in Science increased when it was taught using the STAD method.

The findings regarding the significant difference between STAD and traditional methods of teaching were confirming the findings of Fernando (2008), Sanjonas (2009) and Romero (2010) in their recent studies. They concluded that STAD, a cooperative learning technique was a superior teaching strategy than traditional method in teaching. The performance of the students despite of the fact that the control group made also the mean scores increase in the posttest, the mean difference between the two contradicting methods were significantly different favoring the cooperative learning over the traditional method of teaching.

The above finding corroborates with the earlier study of Keramati (2009), entitled "The Effect of Cooperative Learning on Academic Achievement of Physics Course," was found that experimental group of students taught by cooperative learning (STAD technique) were more successful than control group of students. At this point, it was found that cooperative learning increased academic achievement of students to a higher level when compared to conventional teaching method. Similarly, it was found that subject in cooperation tended to have higher scores on both the posttest and questionnaire measuring attitudes toward Science course.

This is related also with the study of Olchondra (2010), she concluded that STAD is the best teaching method among the three teaching strategies such as STAD, Jigsaw and traditional that were used in her study. Based on her, after giving the posttest using the three types of teaching method, it could be seen that the performance of the students in the STAD method registered the highest mean.

Another study conducted by Van Wyk (2013), who made a research on the effectiveness of STAD as a teaching strategy on grade 10 Learners' Economics knowledge. Data was collected from 229 grade 10 Economics learners and eight teachers at secondary schools. Teachers used both STAD and direct instruction by teaching learning outcome for Contemporary Economics Issues and from the Economics curriculum. Learners completed a 40-item multiple choice economics test as a pretest and posttest. Findings revealed that STAD as a teaching strategy increased learners' knowledge of contemporary economics issues statistically as compared to the direct instruction class.

In the present study, highly significant difference was found between the pretest and posttest for the traditional method of teaching as manifested by the computed probability value of 0.000 which is less than the 0.01 level of significance.

These results implied that traditional method is still effective in teaching Science. Further, this result disclosed that the pupils' academic achievement in Science improved when it was presented using the traditional method of teaching.

Difference between Grade VI Pupils Academic Achievement in Science when they were Exposed to Student Teams-Achievement Divisions STAD and Traditional Method

In this part of the study, the pupil respondents' performances in the posttests for STAD and traditional method were compared to determine which of these strategies were more effective in teaching Science to Grade VI pupils. Results of the t-test analysis are reflected in Table 6.

Table 6. T-test Analysis on the Difference between Pupils Respondents Achievement in Science when they were Exposed to Student Teams-Achievement Divisions (STAD) and Traditional Method of Teaching

Learning Instruction	Posttest		Mean Diff.	t - comp	p-value
	Mean	SD			
STAD	47.13	7.36	12.95	10.91**	0.000
Traditional	34.18	5.76			

Legend: ** = highly significant ($p \leq 0.01$)

It can be observed from Table 6 that highly significant difference was found between the pupils' achievement in the posttests for the STAD and traditional method as implied by the computed probability value of 0.000 which was less than the 0.01 level of significance.

These results implied that STAD was better than the traditional method in teaching Science to Grade VI pupils. Moreover, this meant that the pupils learned more when topics in Science were presented using the STAD technique.

This finding was quite different with that of previous research done by Khan (2011). Results of his study showed no significant difference on students' achievement in Chemistry when STAD was utilized in the experimental group. These results were corroborated by Majoka et.al (2010) who investigated on students taking up Home Economics, and Adesoji and Ibraheem (2009) who introduced STAD in the graduate students and also found no significant differences in the academic achievement of the experimental and control groups.

The results of the present study conformed to the findings of the investigation made by Suguna (2007), and Vasanthi (2011) who reported that the utilization of the STAD method significantly enhanced the students' overall academic performance. In addition, students' also showed heightened level of interest in learning after being taught using the STAD method.

Results of the conducted interview corroborated with the findings of the present study. When the pupils were asked if they like working with team/classmates in answering/doing Science activities, all pupils replied "yes" they wanted it. Moreover, these pupils stated that working in teams made them understand the concepts in Science easier.

When the pupils were asked if STAD improved their logic/thinking, all pupils replied that "yes" their logic/thinking improved a lot. According to these pupils, sharing of ideas made them more involved in the discussions. Furthermore, they said that they acquired more knowledge through sharing of ideas and in actual activities.

Pupils were also asked if STAD is relevant for pupils to understand Science concepts, all pupils answered "yes." They further said that STAD encouraged them working together that improved their overall performance in Science.

CHAPTER IV

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary of the major findings, the conclusions arrived at based on the findings, and the recommendations given in accordance with the conclusions.

Findings

This study determined the effect of Student Teams-Achievement Divisions (STAD) technique on academic achievement of Grade VI pupils of Mandile Elementary School during the fourth grading period of the school year 2016-2017.

Using the procedures described in the preceding chapter, the answers to the problems raised in this study were ascertained and summarized as follows: findings revealed that in the 60-item pretest which was administered before exposing the pupil respondents to STAD, majority of the pupils got scores from 12 to 23. The mean was computed at 23.61 while the standard deviation which measures the spread of pupils' scores from the mean was recorded at 5.79.

After exposing the Grade VI pupils to STAD, posttest was administered and results showed that almost one-half of them registered scores from 36 to 47. The mean and standard deviation were recorded at 47.13 and 7.36, respectively.

In the 60-item pretest, majority of the pupils got scores from 12 to 23. The mean was computed at 23.61 and the standard deviation was recorded at 5.79.

After exposing the pupils to traditional method of teaching Science, majority of the respondents got scores from 24 to 35. The mean and standard deviation were computed at 34.18 and 5.76, respectively.

Highly significant difference was found between the pretest and posttest results for the STAD teaching method. Likewise, highly significant difference was found between the pretest and posttest for the traditional method of teaching.

Highly significant difference was found between the pupils' achievement in the posttests for the STAD and traditional method.

Conclusions

Based on the findings of the study, the following conclusions were drawn: there was a significant difference between the pupils' academic achievement in pretest and posttest when they were exposed to Student-Teams-Achievement Divisions (STAD) and traditional method of teaching. STAD was found effective in teaching Science. In the same view, traditional method was also found effective in teaching Science.

There is a highly significant difference between pupils' academic achievement in learning Science when they were exposed to Student-Teams-Achievement Divisions (STAD) and traditional method of teaching. STAD was found more effective than the traditional method of teaching Science.

Recommendations

In light of the findings and conclusions of the study, the following recommendations were drawn:

1. Teachers should utilize Student Teams-Achievement Divisions (STAD) in teaching Science since it was found more effective than the traditional method of teaching.

2. Teachers must be provided adequate trainings and workshops on the utilization of various teaching techniques like an active learning, critical thinking, team teaching, problem-based learning and experiential learning in teaching Science.

3. Teachers could be required to produce at least one research in a year with a focus on factors affecting pupils' performance in Science. In this way, they could find ways and means to improve the academic performance of elementary pupils in the said subject.

4. Teachers should be required to enroll in Graduate School to make themselves up-dated on the latest trends, techniques and pedagogies in teaching.

5. Teachers should monitor the dynamics of the group setting, place an emphasis on collaboration and motivation, and assess the mastery of learning materials by the pupils on a group and individual basis. The pupils must be empowered with the necessary environment and structure in order to reach higher levels of achievement and content literacy.

6. For future researchers, further study along this line could be conducted. Inclusion of pupils' motivation, attitudes toward the subject could be considered to further improve the pupils' achievement in Science.

REFERENCES

[1] Adesoji, F. A., & Ibraheem, T. L. (2009). Effect of student teams achievement divisions and mathematic Knowledge on learning outcomes in chemical kinetics. The Journal of International Social Research, 2(6), 15-16.

[2] _____Effects of student teams-achievement divisions strategy and Mathematics knowledge on learning outcomes in chemical kinetics. Available: http://www.Sosyalarastirmalar .com/ cilt2 /sayi6pdf/ adesoji_ibraheem.pdf. 2009.

[3] Avard, M. (2009). Student-Centered Learning in an Earth Science, Preservice, Teacher- Education Course. Journal of College Science Teaching, 38 (6), 24-29. (ERIC document no: EJ848597). Available at ERIC database. Accessed May 1, 2011.

[4] Bernaus, M., & Gardner, R.C. (2008). Teacher motivation strategies, student perceptions, student motivation, and english achievement. The Modern Language Journal, 92, 387-401. DOI: 10.1111/j.1540-4781.2008.00753.

[5] Cruz, J. M., Gutierrez, D. S., Ziganay, V. S., and Caintic, H. E. (2010). Into the Future: Science and Health 6. Teacher's Manual for Science and Health 6. Revised Edition.

[6] Dean, D., Jr., & Kuhn, D. (2006). Direct instruction vs. discovery: The long view. Science Education, 91(3), 384-397. Doi:10.1002/sce.20194.

[7] Enriquez, R. S. (2011). Cooperative and Non-cooperative Learning Strategies in Teaching Elementary Science and Health IV in the South District of San Ildefonso, Bulacan. (Unpublished Master's Thesis). Bulacan Agricultural State College, San Ildefonso, Bulacan.

[8] Fernando, B.M. (2008). Developing Leadership through Cooperative Learning Strategy. (Unpublished Master's Thesis). University of the Philippines, Quezon City, Philippines.

[9] Garcia, Carlito D. (2005). Principles and Strategies of Teaching: A Skills Approach.Manila: Books Atbp. Publishing House Corp.

[10] Harris, A.D., McGregor, J.C., Perencevich, E.N., Furuno, J.P., Zhu, J., Peterson, D.E., Finkelstein, J. (2006). The Use and Interpretation of Quasi-Experimental Studies in Medical Informatics. Journal of the American Medical Informatics Association (JAMIA) and the International Journal of Medical Informatics (IJMI) Retrieved April, 2017 from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1380192

[11] Innovative Learning. (2009). Student team achievement divisions. Retrieved May 9, 2012, from http://www.innovativelearning/learning/cooperative_learning.html

[12] Iqbal, M. (2010). Effects of cooperative Learning on Academic Achievement of Secondary School Students in

Mathematics (Doctoral dissertation, University of Arid Argiculture. Rawalpindi, Pakistan). Retrieved from http://www.prr.hec.gov.pk/Thesis/239.dpf

[13] Jacobs, G. (2006). Cooperative Learning and Second Language Teaching. Cambridge University Press.

[14] Jalil, P. A., Abu Sbeih, M. Z., Boujettif, M., & Barakat, R. (2009). Autonomy in Science Education: A Practical Approach in Attitude Shifting towards Science Learning. Journal of Science Education & Technology, 18 (6), 476-486.

[15] Jardeleza, Edgar L. (2008). Selected Strategies on Cooperative Learning Approach in Developing English Language Skills. Marinduque State College.

[16] Johnson, D. W., & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. Educational researcher, 38(5), 365- 379. http://dx.doi.org/10.3102/0013189X09339057

[17] Jolliffe, W. (2007). Cooperative learning in the classroom: Putting it into practice: Sage Knowledge Publishing. University of Hull.

[18] Keramati, M. (2009). The Effect of Cooperative Learning On Academic Achievement of Physics Course. Journal of Computers in Mathematics and Science Teaching, 29(2), 155-173. Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).

[19] Khan, G. (2011). Effect of Student's Team Achievement Division (STAD) on Academic Achievement of Students. Available: www.ccsenet.org/ass

[20] Komiya, I., Torii, H., Fujii, Y., & Hayashizaki, N. (2008). Relationship between Students' Interests in Science and Attitudes towards Nuclear Power Generation. Progress in Nuclear Energy: An International Review Journal, 50 (2-6), 719-727. DOI:10.1016/j.pnucene.2007.11.068.

[21] Majoka, M. et.al (2010). Student Team Achievement Division (STAD) as an active learning strategy: empirical evidence from mathematics classroom. Available http:// cuin561su12.wikispaces.com/file /view/ Student+ Team Achievement+ Division+(STAD) +article.pdf

[22] Mallow, J. V. (2006). Science Anxiety: Research and Action, Chapter 1. Handbook of College Science Teaching. Retrieved from, http://learningcenter.nsta.org/files/ PB205X- 1.pdf (Accessed December 10, 2010).

[23] McCafferty S.G. (2006). Connections between cooperative learning and second language learning and teaching. Cooperative Learning and Second Language Teaching (pp.18-29), Cambridge: Cambridge University Press.

[24] Neff, L.S. (2014). Learning Theories. Retrieved from http://bs.serving-sys.com/Bursting pipe?cn=ot&am.

[25] Olchondra, Maria D. (2010). Academic Achievement of Students in Filipino I Exposed to Traditional and Cooperative Learning Strategies. (Unpublished Master's Thesis). Bulacan Agricultural State College, San Ildefoso, Bulacan.

[26] Omondi, A. A. (2014). The Impact of Inquiry-based Approach on Achievement in Mathematics among Pre-school Children in Ongoing Division. (Unpublished Master's Thesis). Communication and Technology of the University of Nairobi, Kajiado Country, Kenya.

[27] Pineda, D. G., and Villar, E. S. (2010). Building Knowledge in Science and Health 6, Book based on Basic Education Curriculum (BEC).

[28] Rai, N., & Samsuddin,S. (2007). STAD Vs Traditional teaching, Redesigning Pedagogy –crpp conference 2007. [Online] Available: http://conference.nie.edu.sg/2007/ paper/ papers/STU349.pdf

[29] Romero, J.M. (2010). The Comparative Effects of the Authority Teaching and Cooperative Learning in Remedial Teaching Program in TLE. (Unpublished Master's Thesis). Pamantasan ng Lungsod ng Maynila. Gen. Luna cor. Muralla St., Intramuros, Manila, Metro Manila.

[30] Sanjonas, R.D. (2009). Effects of Cooperative Learning on the Home Economics Performance, Self-efficacy and the Learning Behavior of Second Quartile Students. (Unpublished Master's Thesis). University of the Philippines. Diliman, Quezon City, Philippines.

[31] Slavin, R. E. (2005). Co-operative Learning: What Makes Group-work Work? In H. Dumont, D. Istance & F. Benavides (Eds.), The Nature of Learning: Using Research to Inspire Practice (pp. 161-178). London: OECD Publishing.

[32] Sorgo, A., & Kocijancic, S. (2011). Presentation of Laboratory Sessions for Science Subjects in Slovenian Upper Secondary Schools. Journal of Baltic Science Education, 10 (2), 98-113.

[33] Suguna, N. (2007). The Effects of Utilizing the STAD Method on Form Four Tamil Comprehension. (M.Ed thesis), School of Educational Studies, University Science Penang, Malaysia.

[34] Van Wyk, M. M. (2010). Do Student Teams Achievement Divisions Enhance Economic Literacy? A quasi-experimental design. Journal of Social Science, 23(2), 83-89. Retrieved from http://www.krepublishers.com/02-Journals/JSS/JSS-23-0- 00010-Web/JSS-23-2-000-10-Abst-PDF/JSS-23-2-083-10-982-Van%20Wyk-M-M/JSS- 23-2-083-10-982- Van%20Wyk-M-M-Tf.pdf

[35] _____ (2013). The Effect of Student Teams Achievement Divisions as a Teaching Strategy on Grade 10 learners' Economics knowledge. International Journal for Cross-Disciplinary Subjects in Education (IJCDSE)4(3), 34-39. Retrieved from http://www.infonomicssociety.org/IIJCDSE/The%20Effect% Students%20Teams %20Achievement%20Divisions%20as%20a%20Teaching %20Strategy%20on%20Grade%2010%20Learners%20Economics %20Knowledg e,pdf.

[36] Vasanthi, P. (2011). The effect of using the STAD method in reading comprehension among Form Four students. (Unpublished M. Ed thesis). School of Educational Studies, University Science Penang, Malaysia.

[37] Yamarik, S. (2007). Does cooperative learning improve student learning outcomes? (Research in Economic Education) (Report). The Journal of Economic Education, 38(3), 259-277. http://dx.doi.org/10.3200/JECE.38.3.259-277

[38] Zakaria, E., Chin, C.L., & Daud.Y. (2010). The Effect of Cooperative Learning on Students Mathematics Achievements and Attitude towards Mathematics. Journal of Social Sciences, 6(2): 272-275. http://dx.doi.org/10.3844/jssp.2010.272.275

[39] Zenginobuz, B,. & Meral, M. (2008). The impact of Cooperative Learning Techniques On Student Academic Performance In A High School Geometry Class in Turkey. In J Luca, Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications, 2791-2801. Chesapeake,Virginia: AACE. Retrieved from http://www.google.com.au/url?

[40] Zulueta, Francisco M. (2006). Principles and Methods of Teaching. Manila: National Bookstore.