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Social

EFFECTS OF ECLECTIC TEACHING IN GRADE IX MATHEMATICS

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Abstract

This study assessed the performance level of Grade IX students in Mathematics after being exposed to conventional teaching approach (CTA) and the eclectic teaching approach. It intended to: (1) describe the profile of students in Mathematics; (2) determine the performance level of students in the pretest and posttest; (3) compare the significant mean improvement from the pretest to the posttest; and (4) find out the significant difference in mean gains of students exposed to both approaches. This experimental study compared the effectiveness of CTA and ETA based on the students' performance level before and after the exposure of these approaches, using the Pretest-Posttest Control Group Design. The students' performance in Section A with CTA and Section B with ETA was low in the pretest, with a minimal improvement in the posttest. No significance in pre-post mean gain was found out in the performance of students in Mathematics IX using both CTA and ETA. Moreover, it was determined that there was no significant mean gain difference between the students' performance in CTA and ETA, which proved that the effectiveness of these approaches were comparable. The findings indicate that ETA can be an alternative way to CTA.

Keywords: CTA; ETA; Learning Exercise; Modular Teaching.

1. Introduction

Progress and development in the world today is impossible without the use of Mathematics theories and principles. Mathematics provides precision in science and technology like the building of infrastructures and in experiments and innovations. Business and accountancy also depend on the principles of Mathematics; the latest of which is the use of algorithms that facilitate bank transactions and the stock market. All these are dependent on the appropriate teaching of Mathematics in the classroom by competent teachers. Mathematics, like any other subject in the curriculum, supports and contributes the fundamental skills for learners in basic education. However, Mathematics is a difficult subject, both to learn and to teach (Abalajon, 1993; Paspasan, 2015). [1] & [2] Being an exact science and the foundation of science and technology, the curricula at all levels of the educational system feature mathematics among the major subjects. But, because of its abstract nature, it is wrestled with or endured, at its best, rather than enjoyed by most young learners who are not mathematically inclined (Acelajado, 2006). [3] On the other hand, developed nations can be distinguished from the developing and underdeveloped ones in the field of mathematics.

However, in the global setting, a country's development in mathematics may not be equated with a high achievement or even attitude of the students towards the field. Progressive countries like the United States of America, for example, outperforms in Mathematics, Science and Reading by students from East Asian countries like Singapore and South Korea (TIMSS and PIRLS International Study Center, 2011). [4] Hence, through this, enumerable countries are impelled to work hard in improving their achievement in education, through curricular re-engineering, for instance, enhancing guidelines for licensure and certification of teachers, or lengthening the number of school years in formal schooling . The Philippines, as an example, has recently adopted the K to 12 Basic Education Curriculum, by virtue of RA 10533, with the hope of developing scientifically literate individuals equipped with globally competitive ideas and skills.

The shift to a new curriculum has been a product of the analysis of the performance of the Philippine education in the past years. It has been observed that the Republic of the Philippines is far from the ranking of Mathematics with other countries. Results, from international surveys and achievement tests, place the Philippines at the bottom rank in science and mathematics. The Executive Opinion Survey in 2011–2012 of the World Economic Forum reveals that the Philippines ranks 48th out of 62 countries worldwide in the quality of math and science education. In addition, a trend in the National Achievement Test in the Philippines for the past ten years shows a depressing result that out of the subjects administered, Mathematics has a depreciating Mean Percentage Score (MPS). The MPS in Mathematics in S.Y. 2004 -2005, S.Y. 2005-2006 and S.Y. 2011-2012 are 50.70, 47.82 and 46.37 respectively.

Records of the Mandaue City Comprehensive National High School's MPS in Mathematics during the National Achievement Test show a little progress every year. In S.Y. 2009 to 2010, S.Y. 2010 to 2011 and S.Y. 2011 to 2012, the MPS in Mathematics are 37.34, 43.83, and 44.39 consecutively. Despite of its results, the garnered MPS still do not meet the 75% division passing percentage. This evident low achievement in Mathematics creates a challenge to the Mathematics educators. These global and national contexts pose some critical questions to reflect on for Mathematics teachers, educational leaders, and the government. What went wrong with

Mathematics teaching in the Philippines? Does it mean that Mathematics is the most unfriendly subject among Filipino children? Do Filipino children really born to hate Mathematics or is it the abstract nature of Mathematics that teachers fail to concretize because of the lack of its available teaching strategies to facilitate and simplify learning? How educational leaders monitor the results of Mathematics instruction in the classroom to ensure teaching effectiveness and quality learning? Is there an intervention plan and budgetary allocation by government to respond this dismal scenario?

In this connection with these five philosophical questions, a Mathematics teacher is struggling to generate new instructional materials and strategies to address this problem with less support. Based on the sad reality of students' performance in mathematics, studying on the effects of ETA in mathematics is conducted. The results of the study are beneficial to the following stakeholders: (1) curriculum planners' awareness in the efficiency of using modular instruction as a teaching-learning strategy in eclectic approach of teaching to students with large differences in age, economic status, intelligence, and to provide the ground for upgrading the quality of modular education services in policy making, planning, implementing, and evaluation; (2) administrators introduce ETA to the teachers, to promote good intervention to students' academic performance; (3) Mathematics Supervisors consider the use of ETA to teachers under his or her to increase performance of supervision of Mathematics at all level; (4) Mathematics coordinator would include the use of ETA among all Mathematics teachers in the school under his or her supervision; (5) Mathematics teachers can adopt modular instruction as one of ETA's teaching and learning strategies with flexibility, and (6) students are given orientation on the use of ETA's modules, which allow them to study on their own pace and environment with minimal disruption to personal normal routines.

Conventional Teaching Approach (CTA) refers to a style of teaching wherein the teachers facilitate the learning process of the students through a well prepared lesson plan. In this study, this is characterized with traditional chalk-talk discussion wherein students are asked to do board work in Math. The Eclectic Teaching Approach (ETA) refers to the multisensory approach of teaching that blends the principles of cognition and mental processing, multiple intelligences and processing information to unearth various and unique means of information encoding and processing, with the use of different learning tasks in modular delivery of instruction. Learning Exercises are characterized with a variety of activities related to the subject matter. Its main function is to guide students to learn the selected lessons easily through the use of differentiated activities. Modular Teaching is a type of instruction wherein students learn at maximum pace, with the use of a certain module, which is used as an essential component in ETA. A module refers to a set of independent self-contained units that can be used to form a more complex and clear construct or idea. In this study, modules are used after CTA and ETA exposures, hence this study is asserted.

1.1. Related Literatures

The CTA is anchored on Direct Instruction Theory of Siegfried Engelmann (1931) and Brain-based Learning Theory of Eric Jensen (1950). On the other hand, the ETA is anchored on Facilitation Theory of Carl Roger (1902), Sensory-stimulation Theory of Laird (1985) and Experiential Learning Theory of David Kolb (1939). Direct Instruction Theory orients the

delivery mode of teaching where the teacher uses didactic materials in the most essentialist way of instruction. This includes the use of review of the previous lesson, presentation of the new lesson, guided practice, independent practice, and feedback as the primary steps of direct instruction. The utilization of this theory into actual practice follows the proper use of mastery learning, teacher modelling, use of guided exercises, individual application, and soliciting feedbacks on lessons that they find challenging.

The Theory of Brain-based Learning explains that the brain learns in a natural way, where teachers see learners as active participants in the learning process and act as either a facilitator or a source of information in any means of instructional delivery. This theory supports the dictum that relaxed environment produces happy learning. Physical classroom environment is made spacious and well-ventilated. Social environment presupposes the use of healthy social interaction in the classroom with love, respect, and tolerance. Psychological environment is promoted with the use of teacher enthusiasm and buoyancy. These environments promote relaxed alertness through the use of energizers, appropriate time to nap, visual stimulation through the use of arts integration, and songs. These techniques nurture the amygdala to establish emotional stability for fun and happy learning (Inocian & Lasala, 2014). [5] Constant reminders for students regarding their healthy life styles like the awareness of maintaining 8 to 10 hours of sleep at night, constant physical mobility during the day time, and eating a proper balance diet, and to be humble and self-forgiving in order to maintain a stress-free life.

According to Carl Roger's Facilitation Theory, the educator is a facilitator of learning rather than a sole source of knowledge. Facilitating teachers are able to listen to learners with the correction of their content and skills assimilation. With the use of modules, students tend to be more independent by encouraging them to take responsibility for their own learning. The Theory of Sensory Stimulation involves the idea of stimulating the senses of an individual to enhance learning. Say for instance, if a person chooses to learn in visual presentations, inventive visual resources/models are used, as this need arises. The mode of learning of the students through ETA allows them to make a creative play with visually perceived craft in the module. This theory promotes the concept that the teacher becomes "a guide on the side" rather than "a sage on the stage."

Kolb's Experiential Learning Theory revolves in the core idea that optimal learning is achieved when students' engagement to a certain stimulus or subject is high. The use of modules creates a stimulus for the students to make responses to experiential learning through hands-on activities. The integration and application of real life-scenarios in the modules improves students' engagement in such topic. This theory stresses that only when teachers deliver instruction clearly and explain what the students are expected to learn can the students learn at an accelerated rate. As we advance, increasing number of students, considerable changes in scientific findings, knowledge explosion, inequity in having access to education and all other factors, the schools increase the importance of quality in the educational system. In such time, the teacher can help children by implementing a desirable teaching method that makes them productive citizens in the future.

Teachers have emphasized their active roles emphasize as "teacher facilitators to have the responsibility in updating, customizing, and modifying their curriculum to meet the individual

needs of the classroom" (Gloeckner and Adamson, 1996). [6] They are expected to go far beyond mastering the subject and explain this with their students. It is described by Samson (2014) that modular instruction is an individualized learning, which delivers basis subject matter interaction among learners. [7] Paspasan (2015) dubs this as activity packets that provide students with opportunity to develop their self-esteem and increased level of performance. [2] It is a delivery process in technical education laboratories to address its different levels across the world (Loveland, 1999). [8]

With the utilization of self-learning packages (SLPs), the students are anticipated to retort regularly in learning according to their learning rate. Programmed instruction in module form is a significant innovation in education, as a technique of teaching. It also offers a way in solving issues and problems of instructional delivery. Instructional modules promise an enhancing efficiency for everybody's education, by providing efficient and effective individualized instruction when teaching is challenged with issues, in handling large classes in a most common time. The use of SLPs for self-instruction is involving instructional materials presentation in demonstrating process and understanding (Goldschmid, 2005), [9] in the absence of a teacher.

The Organization of American States (2006) has pointed out the essential features of a module. [10] Carmelotes (2012), in his study comparing the Modular Teaching Approach and Conventional Teaching Approach in learning Trigonometry, shows no significant difference between the improvements of students' performance between two approaches.[11] Further, the performance of the students under the MTA and CTA are both below average in the pretest and posttest. This study gives emphasis on the use of modules as an effective tool in the core processes of teaching-learning, which is complemented by a similar finding of Inocian (1999), with the use of Self-Learning Activities (SLAs) in world history from knowledge to evaluation levels of thinking. [12] The ETA is apt more especially in the teaching for the K to 12 curricular offerings, which emphasizes the use of differentiated instruction. This prompts Inocian & Inocian (2016) to recommend the school administrators to recognize the needed professional enhancements of their teachers in providing creative learning activities in an effective lesson delivery. [13]

1.2. Research Objectives

The research assessed the performance level of Grade IX students in Mathematics with the use of the eclectic teaching approach (ETA) at Mandaue City Comprehensive National High School during the School Year 2014 to 2015. It intended to respond these objectives: describe the respondents' demographics as to age, gender, and the average academic grade in Mathematics; determine the performance level of the Grade IX students in the pretest and posttest Conventional Teaching Approach, and the Eclectic Teaching Approach; (3) compare the improvement of significant mean (pre-posttests) in Grade IX mathematics in CTA and ETA; and (4.) find out the significant difference in the mean gains between the students exposed CTA and ETA.

2. Methods and Materials

2.1. Research Design

This study used the experimental design to compare the effectiveness of CTA and ETA based on the students' performance level before and after they were exposed to these strategies in the fourth quarter, using the Pretest-Posttest Control Group Design. The respondents of the study were the two sections of heterogeneous group. Section A composed of 50 students was exposed to Conventional Teaching Approach, as the non-experimental group; while section B composed of 50 students was exposed to Eclectic Teaching Approach, as the experimental group.

2.2. Research Respondents

The respondents of the study were selected among the heterogeneous class in Mandaue City Comprehensive National High School using a snow-ball sampling technique. These respondents were in 15 years of age who attended regularly their classes using the seamless curriculum for Grade IX Mathematics in the K to 12 Curricular Program, which was implemented in 2015. There were two sections: one is the controlled group and the other one is the uncontrolled group.

2.3. Research Environment

The research is located in the bustling metropolis of the city of Mandaue with two campuses, one in the Centro and the other one in Looc, as annex campus. As one of the public schools, this was established in 1986. The school comprised more than 5,000 students every year.

2.4. Ethical Considerations

Transmittal letters were sent to the superintendent and principal for the approval to conduct this study. A letter of informed consent was sent to the parents of the respondents before the pre-test was conducted. Names of the respondents and their sections were treated with confidentiality.

2.5. Data Gathering Procedures

After the validation of the pre-posttest instrument, the pre-test was administered. Proper instruction was given to the target respondents who were identified as the experimental and the non-experimental groups. Scores were recorded to compare with the posttest score to determine the mean gain.

2.6. The Research Instrument

This study used 2 sets of 20-item test in Grade IX Mathematics which focused on the topics about Quadrilaterals and its Properties. This was used for the pre and posttests in both sections. A pretest was administered in the two groups before the start of the investigation and a parallel-question posttest was administered in the two groups after subjecting the students into the two teaching approaches. The difference in the mean of both groups was calculated and performance of the students in the two groups was compared. The first set of test item which was used as the

pretest was taken from the Department of Education Learning Manual for Grade IX Mathematics. The second set of test item which was used as posttest was made by the researcher parallel to the item given in the pretest. For the validity of the instruments, Mathematics experts were consulted as regards to their suggestions, corrections and for refinement of the research instrument. The modules used were suggested by the Department of Education EASE (Effective Alternative Secondary Education) Project, which were administered to the experimental groups for 4 weeks.

2.7. Statistical Tools

The data were treated using simple percentages to determine the profile of the student-respondents, z-test for single and large sample to determine the pretest and posttest performance of the students in terms of their achievement in Math IX when exposed to the two strategies, t-test of dependent or correlated means to determine the improvement from the pretest to the posttest in Math IX when students were exposed to Conventional Teaching Approach and Eclectic Teaching Approach, and t-test of mean difference to determine a significant mean difference of the use of two approaches, which all tests treated at 5 % level of significance.

3. Results and Discussion

3.1. Profile of the Respondents

Table 1: Profile of the Students in Section A as to Age and Gender

Gender / Age	Male		Female		Total	
	f	%	f	%	f	%
16	4	22.22	1	3.12	5	10.00
15	10	55.56	23	71.88	33	66.00
14	4	22.22	8	25.00	12	24.00
Total	18	100.00	32	100.00	50	100.00
Mean Age	**15**		**15**		**15**	

Table 1 depicts the presentation of the respondents' ages and gender of the selected two sample sections with 45 students in each section. The respondents' ages range from 14 to 16 implies that they belong all to the adolescent age category, which Piaget characterized with high level of abstraction of information. These respondents were enrolled in Mathematics IX subjected to the Conventional Teaching Approach in the uncontrolled group.

Table 2: Profile of the Students in Section B as to Age and Gender

Gender / Age	Male		Female		Total	
	f	%	F	%	f	%
17	2	9.09	0	0.00	2	4.00
16	6	27.27	1	3.57	7	14.00
15	12	54.55	19	67.86	31	62.00
14	2	9.09	8	28.57	10	20.00
Total	22	100.00	28	100.00	50	100.00
Mean Age	**15**		**15**		**15**	

Table 2 shows the equal number of students from Sections B that serve as the controlled group, with a negligible percentage of older respondents compared with the uncontrolled group. Both groups represented more females than males. Tables 3 and 4 reflected the frequency and percentage distribution of the respondent's average academic grade in Mathematics VIII in each section. The grades were used as the average of the four grading periods of the students in Mathematics in the previous school year of 2013–2014.

Table 3: Average Academic Grade in Mathematics VIII of the Respondents in Section A

Rating	Category	f	%
90 – Above	A (Advanced)	3	6.00
85 – 89	P(Proficient)	16	32.00
80 – 84	AP (Approaching Proficient)	15	30.00
75 – 79	D (Developing)	16	32.00
74 – below	B (Beginning)	0	0.00
Total		50	100.00

Table 3 shows that out of 50 respondents three (3) or 6.00 percent obtains a grade of 90 percent and above, which is classified as Advanced; 16 or 32.00 percent, Proficient; 15 or 30.00 percent, Approaching Proficient; 16 or 32.00 percent, Developing; and 0 or 0.00 percent, Beginning respectively. It could be drawn from the data that section A respondents achieved Developing, Approaching Proficiency, and Developing in their Mathematics performance, indicative that they belonged to the average group.

Table 4: Average Academic Grade in Mathematics VIII of the Respondents in Section B

Rating	Category	f	%
90 – Above	A (Advanced)	2	4.00
85 – 89	P(Proficient)	19	38.00
80 – 84	AP (Approaching Proficient)	11	22.00
75 – 79	D (Developing)	19	38.00
74 – below	B (Beginning)	0	0.00
Total		50	100.00

As gleaned on Table 5 that (2) or 4.00 percent obtains a grade of 90 percent and above, which is classified as Advanced; 19 or 38.00 percent, Proficient; 11 or 22.00 percent, Approaching Proficient; 19 or 38.00 percent, Developing; and 0 or 0.00 percent for Beginning. It could be drawn from the data that section B of the respondents achieved Proficient and Developing in their works in Mathematics VIII. Both sections showed a relatively average academic standing in Mathematics when they were in Grade VIII. These profiles qualified the basic requirement of an ideal population.

3.2. Pre-test Performance Level of Grade IX Students in Mathematics before Subjecting to CTA and ETA

Table 5 shows the pre-test performance level of the respondents in Section A and B before subjecting to the conventional teaching and the eclectic approaches. The test focuses on the following learning competencies: (1) the learners identify quadrilaterals that are parallelogram;

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(2) the learners' determination on conditions that assure concepts on quadrilaterals and parallelograms; (3) the learners' utilization of properties in finding measures of involving parallelograms; (4) the proving of the learners on theorems in different kinds of parallelograms; (5) the learners prove the Midline Theorem; (6) the learners prove theorems on trapezoid; and 7.) the learners solve problems involving parallelograms and trapezoids. As hypothesized that it showed an insignificant difference of the hypothetical mean and the actual mean in Mathematics IX, Table 5 shows the actual mean, the hypothetical mean (H.M.), the difference between the mean and the standard deviation (SD) of the two groups in Mathematics IX are significantly comparable.

Table 5: Performance Level in the Pretest in Grade IX Mathematics

Section	n	H. M.*	Actual Mean	Difference between Means	SD	Test Statistics		Decision
						Computed z	Tabled Value	
A	50	15	8.54	6.46	2.44	18.72	1.96	Significant
B	50	15	8.60	6.40	2.36	19.18	1.96	Significant

For significance at α = 0.05, z ≥ 1.96
*Hypothetical Mean was based on the 75% passing percentage of the DepEd

From Table 5, it is noted that the pretest of section A obtained an actual mean of 8.54 which is 6.46 lower than the hypothetical mean of 15. On the other hand, section B had an actual mean of 8.60 which is 6.40 lower than the aforementioned hypothetical mean value. Their Mathematics IX performance was Below Average. This meant further that the students' performance before they were exposed to CTA and ETA did not reach the standard performance of 75%. This Below Average performance revealed that the students did not have any idea on the aforementioned competencies. In addition, the students did not have encountered such concepts yet in any discussion or reference material during their previous grade level.

3.3. Performance Level of Grade IX Students in Mathematics after Subjecting to the Eclectic Teaching Approach

Table 6 shows the respondents' posttest level of performance in Section A and B after the utilization of the modular and conventional teaching approaches. Section A was exposed to Conventional Teaching Approach, a type of a teacher-centered class, where the teacher discussed the concepts in a traditional lecture method. All the source of information about the lesson was controlled by the teacher. The learners were given time to answer activities regarding the lesson, after the teacher's lecture. Section B was exposed to the Eclectic Teaching Approach, where students were facilitated by the teacher. The learners were divided into groups of 5 members. Each group was given modules about the learning competencies on quadrilaterals and its parts. The groups were instructed to study together the given module and perform the exercises and other learning tasks. Every meeting, the teacher followed up each group's activities to determine their progress in every lesson.

Table 6: Grade IX Students' Posttest Performance in Mathematics

Section	n	H. M.	Actual Mean	Difference between Means	SD	Test Statistics		Decision
						Computed z	Tabled Value	
A	50	15	9.92	5.08	2.33	15.42	1.96	Significant
B	50	15	10.54	4.46	3.98	7.92	1.96	Significant

For significance at α = 0.05, z ≥ 1.96

Table 6 presents that Section A's CTA actual mean of 9.92; while Section B's ETA actual mean of 10.54. Section A received a computed z –test value of 15.42 while section B's computed z-test value was 7.92. It was observed that the students' performance of their exposure to CTA and ETA still did not reach the standard performance of 75%. This Below Average performance was attributed to the different students' abilities in grasping mathematical concepts, even when presented in a more simplified manner. This showed the non-mastery of the basic mathematics concepts. Their hesitation to ask questions and get clarified with their confusion on the lesson was one of the factors that affected their below average performance in the posttest. In the CTA, they felt hesitant in asking questions since it was the teacher who directed the whole discussion. While learners were expected to learn independently in the ETA, they were hesitant to ask questions since they were expected to draw out their own ideas based on the insights they acquired from the module, which took time for them to generate among their team members.

3.4. Mean Gains in the Pretest and Posttest obtained by the Two Sections in Mathematics IX

As shown in Table 7, section A's exposure to CTA obtained a mean gain of 1.38 with a standard deviation of 2.84. While, section B's exposure to ETA obtained a mean gain of 1.94 with a standard deviation of 4.75. Computed t-test values of 3.44 and 2.89 in section A and B respectively were obtained. Both values were greater than the tabled value of 2.00 at 5% level of significance with a degree of freedom of (n-1), which rejected the null hypothesis. As a recall, Table 6 describes the performance of the students qualitatively to be still Below Average. However quantitatively, this was accompanied with an apparent positive increment of their performance from the pretest to the posttest. This improved performance was attributed by the sensory stimulated visuals in the modules used by section B and the freedom of the students to study at their own pace. For section A, the presence of the teacher who actively discussed the lessons gave a great help, hence it showed improvement of their mathematics performance.

Table 7: Mean Gain of Section A and B from the Pretest to the Posttest in Mathematics IX

Section	n	Pretest Mean	Posttest Mean	Difference between Means	SD of the Difference	Test Statistics		Decision
						Computed t	Tabled Value at α = 0.05 with (n-1) df	
A	50	8.54	9.92	1.38	2.84	3.44	2.00	Significant
B	50	8.60	10.54	1.94	4.75	2.89	2.00	Significant

3.5. Comparison of the Two Sections Exposed to CTA and ETA

It is evident from Table 8 that section A's exposure to CTA generated a mean gain of 1.38 with a standard deviation of 2.84. On the other hand, section B's exposure to ETA generated a mean gain of 1.94 with a standard deviation of 4.75. The mean gains of both groups had a difference of 0.56. This gave a computed t-test value of 0.72. This computed t-test value was less than the tabled value at 5% significance level. The students exposed to the Conventional Teaching Approach and Eclectic Teaching Approach had the same performance, which meant that it did not matter what teaching approach was given to the students that affected their mathematics academic performance. Hence, it was implied that mathematics had a wider   prerogative or selection of teaching approaches that would improve mathematics instruction, which conformed the old notion that learning mathematics necessitated the use of teacher modelling and didactic materials. The construction of the modules and its corresponding learning activities in the ETA had no difference with that of the teacher controlled strategies in the CTA. As to the convenience of the teacher, the learning exercises found in the modules in the ETA were important since these gave the same performance level to students taking the learning exercises in the CTA. In the ETA, the teacher had more time to guide students on their own pace since the learning activities catered to the different needs of the learners, through reading inventive diagrams, texts and problem solving; unlike the CTA, the learners depended on how well the teacher delivered the lesson, which showed no big difference with the use of ETA in the students' mathematics performance.

Table 8: Comparison between Sections A and B in terms of their Mean Gain in Mathematics IX

Section	Mean Gain	SD of the Mean Gain	Difference between Mean Gains	Test Statistics		Decision
				Computed t	Tabled Value at	
A	1.38	2.84	0.56	0.72*	2.00	Not Significant
B	1.94	4.75				Not Significant

4. Conclusions & recommendations

Performance of students who were exposed to the CTA and the ETA was low in the pretest, with a minimal improvement in the posttest. Moreover, it was determined that there was no significant mean gain difference between the students' performance using these aforementioned approaches of teaching, which proved that the effectiveness of these approaches were comparable. Mathematics, as the most abstract subject in the curriculum, needed the unfolding of expert teachers both in content and pedagogical knowledge. The following will be taken into considerations, as vital recommendations for further study: (1) teaching modules in Mathematics 9 will be reviewed based on the content and performance standards, learning competencies are realigned with the teacher's lesson objectives; (2) teachers' biases on the student-centered learning activities that sacrifice the expected Mathematics competencies and the actual nature of the conventional strategies intended for math teaching; (3); designing learning modules in accordance with what the children need, not what the teacher wants.

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