Title: MathDali Program and Its Effectiveness on the Mathematics Performance of Grade 4 Students

Baliuag University and Knowledge Channel Foundation, Inc.

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Background of the Study

Mathematics has become a necessity for people of all ages to be successful in life. It has gained more attention with the rapid advances of information and communication. It has been considered as the mother of all learning in both arts and sciences (Andaya, 2014). It is essential in almost every field like measurement in sizes, angles in sports stroke, technology, and economics. It is not just a tool for computation but a means for understanding structures, relationships, and patterns to produce solutions for complex real-life problems. Moreover, the trends nowadays are interactive and more visual class discussion compared to the traditional way of teaching mathematics. However, although the usefulness of mathematics has been proven in daily life, there are factors that adversely affect the students' ability to understand and apply mathematical concepts.

As Filipino learners move on to the ASEAN integration, providing mastery of concepts in mathematics is essential. Thus, the *MathDali Project*, which includes videos, games, and session guides on interactive classroom discussions, has been conceived. Creating an impact on the new learning design, *MathDali* can be a contributing factor in addressing and attaining the K to 12 curriculum implementation.

Indeed, *MathDali* has reportedly increased learner's conceptual understanding, critical thinking, and problem solving in mathematics. It is imperative, therefore, that the effectiveness of this project be evaluated.

Background of the KCFI

Knowledge Channel Foundation, Incorporated (KCFI), is an educational transmedia corporation that aims to contribute to the government's goal of alleviating poverty through education. For the past seventeen years, KCFI has provided learners with access to "multimedia learning materials on air through K-Channel television, online through KCh, and on-demand through KCh Portable Media Library (kchonline.ph)." As a foundation that aims to provide holistic and systemic programs, it trains teachers on teaching pedagogies and methods. It likewise arms principals with additional skills through its leadership enhancement programs. It continues to form partnerships with generous donors and universities, schools, and other organizations who share the same vision of an educated Philippines.

Given its years of experience in the field of education, KCFI is no stranger to the challenges besetting the educational system of the country. As a transmedia company, it strives to tell the story of each and every curious Filipino student who is hungry for knowledge, thirsting for additional skills, perfectly absorbent for a change in attitudes, and openly accepting of positive values. By allowing students to access the learning materials provided by the foundation, KCFI journeys with its Filipino students who are willing to gain more knowledge, skills, values, and attitudes that help them in achieving their dream of success.

As an evidence, KCFI has produced over 181 videos for Filipino elementary school students. A few of these videos focus on math such as *Mathtinik* and *Solved*. *Mathtinik*, together with shows like *Hirayamanawari*, influenced a generation of learners way back in the 1990s. This is the same purpose that drove KCFI's President to produce a new Math Show that would be relevant to the current crop of grade four students in the country. The show aims to address the country's need to develop more interested learners who would do better at learning math as it injects in each and every student a growth mindset.

However, before such a show could be produced and before a holistic program could be developed, the foundation had to take a look at theories and practices that could help in constructing an ample framework for the entire project.

Mathematical Views on Concepts

Carol Dweck (2006) believes that developing a love for learning, an interest for challenges, and an ability to thrive on obstacles are the key factors to succeeding in life. Dweck refers to these as "characteristics of an individual who adheres to a growth mindset as opposed to a fixed mindset." Individuals with a growth mindset are not afraid to make mistakes and consider failures as opportunities for learning. They are resilient and they believe that success requires much effort with learning.

Similarly, by borrowing heavily from Carol Dweck's principles, Jo Boaler (2015) believes that consistent effort with learning and the resilience to learn from mistakes and failures are the keys to developing a math mindset. Believing that there is no such thing as a math brain, Boaler espouses that no person is born being innately good or innately bad at math. Due to the brain's plasticity, new neural connections are formed every time a new learning is discovered by a person and every time a mistake is committed and reviewed. It is this continuous physiological growth of neural connections that becomes the key to developing a growth mindset.

Objectives of the Study

The general objective of the study is to determine the effectiveness of *Mathdali* learning design in increasing the mathematical performance of the learners.

Specifically, this study aims to:

1. Identify and describe the mathematics learning of grade four learners as measured by their performance;
2. Describe the *mathitudes* of grade four math learners;
3. Evaluate the effectiveness of *MathDali* program design in improving the students' learning performance; and
4. Present the challenges in the utilization of design as perceived by the teacher being a facilitator.

Framework of the Study

Figure 1 below shows the paradigm of the study.

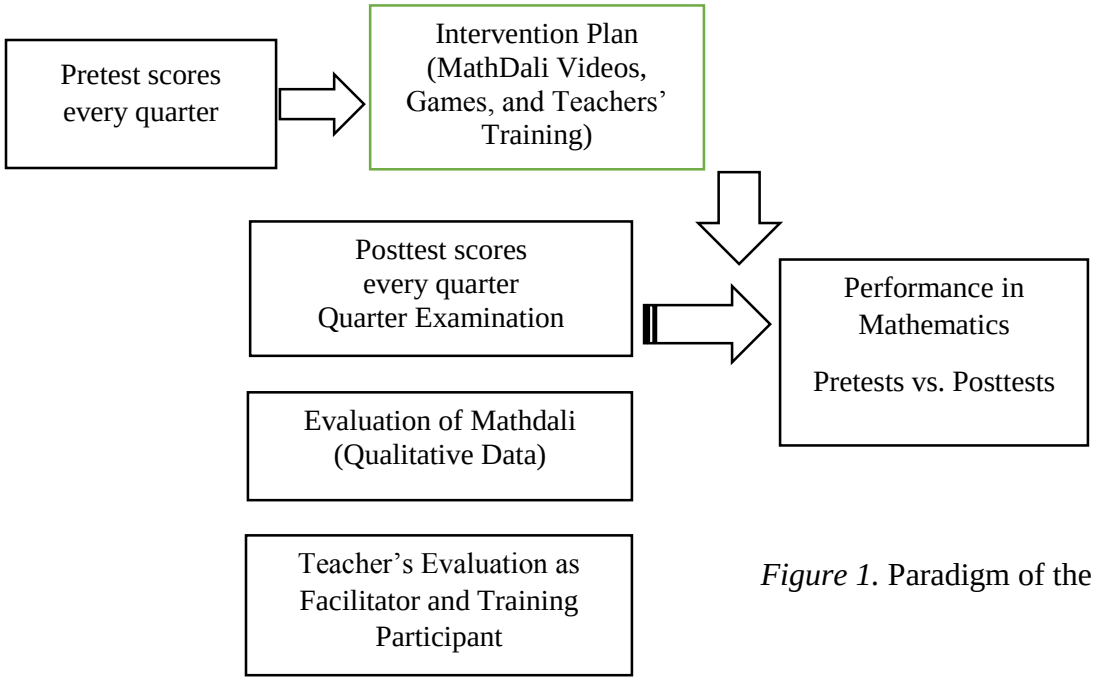

Figure 1. Paradigm of the study.

The pretest scores in mathematics tests covering the four quarters served as baseline data in the development and implementation of the intervention plan.

Intervention plan is the action or process of applying strategies to improve knowledge and performance of the participants through the use of Mathdali gadget.

Posttest and quarter scores refer to the assessment given after the implementation of the intervention program.

Performance refers to the difference between the pretest and posttest results which measured the mastery of the students' concept, critical thinking, and skills in solving problems in mathematics.

Evaluation of the program was done by the teacher as facilitator of learning using videos and games with math learners

Teachers' training activities were attended by the mathematics teachers that qualitatively evaluated the training.

For the purpose of this study, the following interventions were applied:

Learning Design	**Components**
MathDali Learning Design	*MathDali* Videos, Games, and Teachers' Training

Methodology

The research design of the study used both the qualitative and the quantitative methods. For the *qualitative method*, a formal interview of the participants was conducted through focus group discussion (FGD). In addition, monitoring of classes was done through field observations. For the *quantitative method*, an experimental study was conducted using two classes of grade four students. Data were collected using validated tests in mathematics, Grade 4 level, to determine the performance of the students. Analysis of the data was done through the use of SPSS.

Participants

The respondents came from the Baliuag University Basic Education Department which is located along Gil Carlos St., Baliwag, Bulacan. Two classes in grade four were identified as participants in this study.

The two classes were given the following learning design: *MathDali* Videos, Games, and Teachers' Training.

Results and Discussion

SOP1. Identify and describe the mathematics learning of grade four learners as measured by their performance

Table 1

Individual Scores of the Students During the First Quarter

Range	Equivalent	SECTION A				SECTION B				
		Pretest		Posttest		Pretest		Posttest		
		F	E	*F*	E	*F*	E	*F*	E	
28-34	5	-	-	7	35	1	5	5	25	
21-27	4	8	32	7	28	6	24	9	36	
14-20	3	13	39	7	21	11	33	8	24	
8-13	2	1	2	1	2	4	8	-	-	
0-7	1	-	-	-	-	-	-	-	-	
		Total	73	Total	86	Total	70	Total	85	
		WM	3.32	*WM*	3.90 (+.58)	*WM*	3.18	*WM*	3.86 (+.68)	OWM
		VI	P		AA		P		AA	3.57
		WM		3.61	AA			3.52	AA	(AA)

Legend:

F	–	Frequency	B – Beginning (1.00 – 1.80)
E	–	Equivalent	AP – Approaching Proficiency (1.81 – 2.40)
WM	–	Weighted Mean	P – Proficiency (2.41 – 3.60)
VI	–	Verbal Interpretation	AA – Approaching Advanced (3.61 – 4.20)
OWM	-	Overall Weighted Mean	A – Advanced (4.20 – 5.00)

Table 1 presents the results obtained from the preliminary analysis of individual scores of the students during the first quarter in mathematics. It was revealed that there is a significant increase in the performance of Grade 4 students in the combined data from pretest

(*WM*=3.61or Approaching Advanced) to posttest (*WM*=3.62 or Approaching Advanced) of the two sections, while 3.57 (AA) is the overall weighted mean for this quarter. This means that the intervention plan (*Mathdali* Videos) significantly helped students to improve their performance in the mathematics subject.

Table 2

Comparison of the Pretest and Posttest Scores of the Students in Sections A and B During the First Quarter

Paired Samples Test

		Paired Differences					*t*	*df*	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	First Quarter Pretest SecA - First Quarter Pretest SecB	-1.529	2.513	.431	-2.406	-.652	-3.548	21	.001
Pair 2	First Quarter Posttest SecA - First Quarter Posttest SecB	.824	4.079	.699	-.600	2.247	1.177	21	.247

Paired Samples Statistics

		Mean	*N*	Std. Deviation	Std. Error Mean
Pair 1	First Quarter Pretest SecA	8.29	22	5.078	.871
	First Quarter Pretest SecB	9.82	22	5.208	.893
Pair 2	First Quarter Posttest SecA	10.41	22	4.540	.779
	First Quarter Posttest SecB	9.59	22	5.106	.876

Table 2 provides the comparison of the pretest and posttest scores of the students in Sections A and B during the first quarter. The results from the paired samples *t-test* indicate that there is sufficient evidence that the posttest scores (M=2.04545, SD=11.76333) are significantly higher than their pretest (M= -1.529, SD=2.513), since the computed t (21) = .001 (pre) and .247 (post) are greater than p>0.05. The 95% confidence interval for this paired difference shows that on the average, the posttest exceeds the pretest scores by at least -.600 to 2.247. This means that there is an increase in the scores and performance of the students who took the posttests.

Table 3
Difficulty Index of Items During the First Quarter

Summary	Section A		Section B	
	Pretest	Posttest	Pretest	Posttest
Total	14.99	18.73	14.91	18.2
GWA	0.44	0.55	0.43	0.53
V.I.	A	A	A	A
Com	0.50 A		0.48 A	
OCom	0.49 (A)			

Legend:

D.I.	–	Difficulty Index	
VD	–	Very Difficult	(0.00 – 0.20)
D	–	Difficult	(0.21 – 0.40)
A	–	Average	(0.41 – 0.60)
E	–	Easy	(0.61 – 0.80)
VE	–	Very Easy	(0.81 – 1.00)
V.I.	–	Verbal Interpretation	
GWA	–	General Weighted Average	
Com	-	Combined Scores	
OCom	-	Overall Combined Scores	

Table 3 shows the results obtained from the analysis of the difficulty index of items during the first quarter. It was noted that there is a significant improvement on the performance of Grade 4 students for both sections A (0.50) and B (0.48). The overall combined

results showed that there is equal representation of the two sections (0.49) on the difficulty index from the items included in the tests. This means that after taking the pretest and having implemented the intervention program (*Mathdali* Videos), an increase in knowledge and improvement in the performance in mathematics posttest had been exhibited by the students.

Table 4

Individual Scores of the Students During the Second Quarter

Range	Equivalent	SECTION A				SECTION B				
		Pretest		Posttest		Pretest		Posttest		
		F	E	*F*	E	*F*	E	*F*	E	
41 – 50	5	-	-	3	15	-	-	4	20	
31 – 40	4	-	-	7	28	15	60	5	20	
21 – 30	3	16	48	12	36	6	18	13	39	
11 – 20	2	5	10	-	-	1	2	-	-	
0 – 10	1	1	1	-	-	-	-	-	-	
		Total	59	Total	79	Total	80	Total	79	
		WM	2.68	*WM*	3.59	*WM*	3.63	*WM*	3.59	
		VI	P		P		AA		P	*OWM* 3.38 (P)
		WM		3.14	P			3.61	AA	

Table 4 provides the results obtained from the analysis of the individual scores of the students during the second quarter in mathematics. A significant increase was observed in the performance of grade four students in the combined data from pretest (*WM* =3.14 or Proficiency) and posttest (*WM*=3.61 or Approaching Advanced) of the two sections, with a 3.38 (P) as the overall weighted mean for this quarter. This means that the implementation of the intervention plan has a significant role in the improvement of the students' performance in mathematics.

Table 5

Comparison of the Pretest and Posttest Scores of the Students of Sections A and B During the Second Quarter

Paired Samples Test

		Paired Differences					*t*	*df*	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Second Quarter Pretest SecA – Second Quarter Pretest secB	-1.13636	6.69254	1.42685	-4.10367	1.83094	-.796	21	.435
Pair 2	Second Quarter Posttest SecA – Second Quarter Posttest SecB	.68182	9.47370	2.01980	-3.51859	4.88222	.338	21	.739

Paired Samples Statistics

		Mean	*N*	Std. Deviation	Std. Error Mean
Pair 1	Second Quarter Pretest SecA	26.8636	22	4.42176	.94272
	Second Quarter Pretest secB	28.0000	22	4.97613	1.06092
Pair 2	Second Quarter Posttest SecA	32.1818	22	5.95728	1.27010
	Second Quarter Posttest SecB	31.5000	22	7.19623	1.53424

Table 5 provides the comparison of the pretest and posttest scores of the students in Sections A and B during the second quarter. The results from the paired samples *t*-test indicate that there is sufficient evidence that the posttest scores (M=0.68182, SD=9.47370) are

slightly higher than their pretest (*M*= -1.13636, *SD*=6.69254), since the computed *t* (21) = -.796 (pre) and .338 (post) are greater than *p*>0.05. The 95% confidence interval for this paired difference shows that on the average, the posttest exceeds the pretest scores by at least 3.51859 to 4.88222. This means that the students' scores and performance increased in the posttest.

Table 6

Difficulty Index of the Items During the Second Quarter

Summary	Section A		Section B	
	Pretest	Posttest	Pretest	Posttest
Total	20.95	33.39	19.74	33.23
GWA	0.42	0.67	0.40	0.66
V.I	A	E	D	E
Com	0.55 A		0.53 A	
OCom	0.54 (A)			

Table 6 shows the results obtained from the analysis of the difficulty index of the items during the second quarter. It can be noted that there is a slight significant improvement in the performance of Grade 4 students in the combined results of sections A (0.55) and B (0.53). The overall combined results showed that there is an equal representation of the two sections (0.54 or A) on the difficulty index from the items included in the tests. This means that after taking the pretest and having implemented the intervention program (*Mathdali Videos*), students indeed showed positive increase in their performance in mathematics in the posttest.

Table 7

Individual Scores of the Students During the Third Quarter

Range	Equivalent	SECTION A				SECTION B				
		Pretest		Posttest		Pretest		Posttest		
		F	E	*F*	E	*F*	E	*F*	E	
41 –50	5	-	-	4	20	-	-	2	10	
31 –40	4	4	16	9	36	1	4	5	20	
21 –30	3	8	24	6	18	3	9	9	27	
11 –20	2	10	20	1	2	15	30	6	12	
0 – 10	1	-	-	2	2	3	3	-	-	
		Total	60	Total	78	Total	46	Total	69	
		WM	2.73	*WM*	3.55	*WM*	2.09	*WM*	3.14	*OWM*
		VI	P		P		AP		P	2.88 (P)
				3.14	P			2.62	P	

Table 7 provides the results obtained from the analysis of the individual scores of the students during the third quarter in mathematics. It was noted that there is a significant increase in the scores of Grade 4 students in the combined data from pretest (*WM*=3.14 or Proficiency) to posttest (*WM*=2.62 or Proficiency) of the two sections. It can be noted that 2.88 (P) is the overall weighted mean for this quarter. This means that the implementation of the intervention plan has a significant role in the improvement of the students' performance in mathematics.

Table 8

Comparison of the Pretest and Posttest Scores of Sections A and B During the Third Quarter

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	*t*	*df*	Sig. (2-tailed)
Pair 1	Third Quarter Pretest SecA - Third Quarter Pretest SecB	6.27273	9.84732	2.09946	1.90667	10.63878	2.988	21	.007
Pair 2	Third Quarter Posttest SecA - Third Quarter Posttest SecB	4.77273	13.11463	2.79605	-1.04197	10.58743	1.707	21	.103

Paired Samples Statistics

		Mean	*N*	Std. Deviation	Std. Error Mean
Pair 1	Third Quarter Pretest SecA	23.0000	22	7.69044	1.63961
	Third Quarter Pretest SecB	16.7273	22	6.99103	1.49049
Pair 2	Third Quarter Posttest SecA	29.7273	22	10.04837	2.14232
	Third Quarter Posttest SecB	24.9545	22	9.31193	1.98531

Table 8 provides the comparison of the pretest and posttest scores of the students in sections A and B during the second quarter. The results from the paired samples *t*-test indicate that the third quarter scores of the two groups (sections A and B) are not statistically equal with regard to their pretest (M= 6.27273, SD=9.84732) results since the computed p-value is less than 0.05, but their posttest (M= 4.77273, SD=13.11463) results are statistically equal since the computed p-value is greater than 0.05. The difference of 6.2727 on the

means of their pretest results is significant. The pretest scores of Section A is statistically higher than the pretest scores of Section B. The 95% confidence interval for this paired difference shows that on the average, the posttest exceeds the pretest scores by at least 1.04197 to 10.58743. This means that the students' scores and performance increased in the posttest.

Table 9

Difficulty Index of the Items During the Third Quarter

Summary	Section A		Section B	
	Pretest	Posttest	Pretest	Posttest
Total	22.19	28.32	13.99	25.43
GWA	0.44	0.57	0.28	0.51
V.I	A	A	D	A
Com	0.51 A		0.40 A	
Ocom	0.46 (A)			

Table 9 shows the results obtained from the analysis of the difficulty index of the items during the third quarter. It was noted that there is a slight to equal significant improvement on the performance of Grade 4 students in the combined score-results of sections A (0.51) and B (0.40). What is interesting about the data is that Section B shows a higher performance than Section A during the posttest (0.51 or A). The overall combined results show that there is an equal representation of the two sections (0.46 or A) on the difficulty index from the items included in the tests. This means that after taking the pretest and having implemented the intervention program (*Mathdali* Videos), students indeed showed a positive increase in their performance in mathematics on the posttest.

Table 10

Individual Scores of the Students During the Fourth Quarter

Range	Equivalent	SECTION A				SECTION B				
		Pretest		Posttest		Pretest		Posttest		
		F	E	*F*	E	*F*	E	*F*	E	
29 - 34	5	-	-	3	15	-	-	3	15	
21 - 28	4	9	36	13	52	3	12	15	60	
14 - 20	3	12	36	6	18	15	45	4	12	
8 - 13	2	1	2	-	-	4	8	-	-	
0 – 7	1	-	-	-	-	-	-	-	-	
		Total	74	Total	85	Total	65	Total	87	
		WM	3.36	*WM*	3.86	*WM*	2.95	*WM*	3.95	*OWM*
		VI	P		AA		P		AA	3.53 (P)
		WM		3.61	AA			3.45	P	

Table 10 provides the results obtained from the analysis of the individual scores of the students during the fourth quarter in mathematics. It was found out that there is a significant increase in the scores of Grade 4 students in the combined data from pretest (*WM*=3.61 or Proficiency) to posttest (*WM*=3.45 or Proficiency) of the two sections. Closer inspection of the table shows that Section B posttest scores (3.95) has increased compared to the pretest scores (+1.0), and that 3.53 (P) is the overall weighted mean obtained for this quarter. This means that the implementation of the intervention plan has a significant role in the improvement of the students' performance in mathematics.

Table 11

Comparison of the Pretest and Posttest Scores of Sections A and B During the Fourth Quarter

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Fourth Quarter Pretest Number of Correct A - Fourth Quarter Pretest Number of Correct B	-.561	3.788	.592	-1.757	.635	-.948	21	.349
Pair 2	Fourth Quarter Posttest Number of Correct A - Fourth Quarter Posttest Number of Correct B	-.585	3.376	.527	-1.651	.480	-1.110	21	.274

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Fourth Quarter Pretest Number of Correct A	7.51	22	3.709	.579
	Fourth Quarter Pretest Number of Correct B	8.07	22	4.782	.747
Pair 2	Fourth Quarter Posttest Number of Correct A	9.00	22	3.202	.500
	Fourth Quarter Posttest Number of Correct B	9.59	22	4.123	.644

Table 11 provides the comparison of the pretest and posttest scores of the students in sections A and B during the fourth quarter. The results from the paired samples *t*-test indicate that the fourth quarter scores of the two groups (sections A and B) are not statistically equal with regard to their pretest (*M*= -.561, *SD*=3.788) results since the computed *p*-value is higher than 0.05, but their posttest (*M*= -.585, *SD*=3.376) results are statistically equal since the computed *p*-value is greater than 0.05. The difference of 0.024 on the means of their pretest results is significant. This means that the pretest scores of the students from section A is statistically higher than the pretest scores of the students from Section B.

Table 12

Difficulty Index of the Items During the Fourth Quarter

Summary	Section A		Section B	
	Pretest	Posttest	Pretest	Posttest
Total	14.03	12.51	13.84	17.84
GWA	0.34	0.31	0.34	0.43
V.I	D	D	D	A
Com	0.33 D		0.39 D	
OCom	0.36 (D)			

Table 12 shows the results obtained from the analysis of the difficulty index of the items during the fourth quarter. It can be noted that there is an equal significant movement on the performance of Grade 4 students in the combined score-results of sections A (0.33) and B (0.39). The overall combined results show that there is an equal representation of the two sections (0.36 or D) on the difficulty index from the items included in the tests. This means that after taking the pretest and posttest and having implemented the *Mathdali* Videos, indeed students showed positive slight increase in their performance in mathematics for the last period.

SOP2. Describe the mathtitudes of grade four math learners

Table 13

Pre and Post Weighted Mean Scores of the Students' Mathtitudes

Mga Pahayag	Pretest		Posttest	
	WAM	VI	*WAM*	VI
1. Natataranta ako pag nakakakita ako ng *math problem* na mukhang mahirap	1.66	LHS	2.48	HS
2. May kumpiyansa ako sa aking sarili pag sumasagot sa math.	3.66	LS	3.84	LS
3. Pakiramdam ko'y malikhain ako sa paghahanap ng iba't ibang paraan para mag-*solve* ng math.	2.89	S	2.84	S
4. Madali para sa akin ang magsolve para sa math.	2.98	S	3.07	S
5. Matataas ang mga nakukuha kong score sa math.	3.07	S	2.98	S
6. Tumataas ang antas ng katalinuhan kapag nagsusumikap ang isang tao sa math.	3.52	LS	3.34	LS
7. Maraming natutunan ang isang tao mula sa kanyang mga pagkakamali sa pag-solve ng math.	2.45	HS	2.52	S
8. Di ako titigil sa pag-solve ng isang math problem hangga't di ko nakukuha ang sagot.	3.11	S	3.34	LS
9. Kapag hindi ko ma-solve ang math problem, susuko na lang ako.	1.55	LHS	1.09	LHS
10. Kapag sinasauli ng guro ko ang mga test paper, tinitingnan ko kung saan ako nagkamali at aaralin ko kung bakit mali ang pag-solve ko.	3.34	LS	3.30	LS
11. Nag-aaral ako ng math para lamang makakuha ng mataas na grade sa exam.	3.14	S	3.23	LS
12. Nagagamit ko ang mga pinag-aralan naming sa math kahit ako'y nasa labas ng paaralan.	3.00	S	3.39	LS
13. Dahil sa math, mas mabilis na akong mag-isip at sumagot ng mga tanong.	2.93	S	3.20	S
14. Hindi ko na kailangan ang math pagkatapos kong mag-aral.	1.61	LHS	1.48	LHS
15. Ginagamit ang math sa lahat ng uri ng trabaho.	2.84	S	3.25	S
16. Natutuwa ako kapag ako'y nagsasagot ng assignment sa math.	3.18	S	3.57	LS
17. Gusto king matututo ng ibang pang mga bagay tungkol sa math.	3.43	LS	3.50	LS
18. Hindi ako interesado sa mga lesson na tinuturo sa amin sa math.	1.57	LHS	1.39	LHS
19. Ang math ang isa sa pinaka-paborito kong subject.	3.34	LS	3.70	LS
20. Gusto kong pinag-uusapan ang math kasama ang aking mga kaibigan at kaklase.	3.45	LS	3.41	LS

Weighted Mean			2.84	S	2.99	S
Overall Weighted Mean				2.92 (S)	

Legend:

F	–	Frequency
WAM	–	Weighted Average Mean
VI	–	Verbal Interpretation
LS	–	Lubos na Sang-ayon (3.26 – 4.00)
S	–	Sang-ayon (2.51 – 3.25)
HS	–	Hindi Sang-ayon (1.76 – 2.50)
LHS	–	Lubos na Hindi Sang-ayon (1.00 – 1.75)
GWA	–	General Weighted Average

Table 13 presents the results obtained from pre and post weighted mean scores of the students' *Mathtitudes.* Most students expressed their *Mathtitudes* before and after taking the survey. They said that they are creative in finding ways to solve problems and get high grades in math. They also said that they don't stop solving until they get the correct answer. Further, they said that they study hard to get high grades in the subject and that they can use math in every practical work, even if it is not in school and think fast to answer mathematical questions. They also expressed that they feel happy every time they answer their assignments and submit them on time. Overall, this area was rated 2.92 or (S).

Table 14

Pre and Post Mathtitude Scores of the Students in Sections A and B

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	*t*	*df*	Sig. (2-tailed)
Pair 1	Math Attitude Pre Math Attitude Post	-.11000	.28318	.06332	-.24253	.02253	-1.737	19	.099

Table 14 provides the comparison between the pre and post *Mathtitude* scores of the students in sections A and B. The results showed that there was no significant effect of the treatment (use of *MathDali*) on the attitude of students since the *p*-value of 0.099 is greater than 0.05. Although the participants' attitude became somewhat better after the implementation of *MathDali*, this difference is not statistically significant. This also implies that *MathDali* does not appear to have influenced the *Mathtitudes* of the students.

SOP3. Evaluate the effectiveness of MathDali program design in improving the students' learning performance

Table 15

Evaluation of the MathDali Gadget as Perceived by Grade 4 Students

Statements / Items	Section A		Section B		Combined	
	WAM	VI	*WAM*	VI	WAM	VI
1. Using the tablet device during mathematics class has an added value.	4.68	SA	4.82	SA	4.75	SA
2. By using the tablet device, I achieve better in my mathematics class.	4.68	SA	4.73	SA	4.71	SA
3. By using the tablet device, it is easier for me to catch up with the math lessons.	4.82	SA	4.73	SA	4.78	SA
4. By using the tablet device, it is fun to learn and participate in mathematics.	4.82	SA	4.82	SA	4.82	SA
5. By using the tablet device, I work more collaboratively with my classmates.	4.64	SA	4.64	SA	4.64	SA
6. Tablet device should be introduced in every school for students to be more engaged in mathematics.	4.55	SA	4.68	SA	4.62	SA
7. I can learn mathematics from the tablet device without the need for print out learning materials.	4.68	SA	4.73	SA	4.71	SA
8. The tablet I use is useful for my everyday class in mathematics.	4.73	SA	4.73	SA	4.73	SA
9. The tablet device I have in learning mathematics is easy to use.	4.86	SA	4.82	SA	4.84	SA
10. The content in the tablet device can be easily comprehended.	4.68	SA	4.55	SA	4.62	SA

11. I feel confident in using my tablet device in my mathematics class.	4.77	SA	4.77	SA	4.77	SA
12. I feel comfortable in using the tablet device for mathematical problems.	4.82	SA	4.68	SA	4.75	SA
13. Mathematics becomes interesting because of the use of a tablet device.	4.86	SA	4.73	SA	4.80	SA
Overall *WAM*	4.74	SA	4.73	SA	4.73	SA

Legend:	*F*	–	Frequency
	WAM	–	Weighted Average Mean
	VI	–	Verbal Interpretation
	SA	–	Strongly Agree (4.21 – 5.00)
	MA	–	Mostly Agree (3.41 – 4 20)
	MDA	–	Mostly Disagree (2.61 – 3.40
	SDA	–	Strongly Disagree (1.81 – 2.60)
	NS	–	Not Sure (1.00 – 1.80)
	GWA	–	General Weighted Average

Table 15 presents the results obtained from the evaluation of the *MathDali* gadget as perceived by the grade four students in improving their performance and interest in math. It was noted that students for both sections strongly agreed that the *MathDali* gadget used in their subject in Math 4 really helped them to understand the lessons and exercises provided them. It was manifested in sections A (*WAM*=4.74 or SA) and B (*WAM*=4.73 or SA) that mathematics becomes an interesting subject because of the use of the tablet making the learning of mathematics easier. They easily catch up with the math lessons, and they feel comfortable in using the tablet device. Moreover, they feel confident in using the tablet, and they expressed the usefulness of the gadget in their everyday mathematics class. They achieve better in their mathematics class, they can easily comprehend their lessons, and the gadget has an added value in learning mathematics. Finally, they could work collaboratively with their classmates. They strongly recommend that a tablet device be

introduced in every school so that learners would be more engaged in learning mathematics. Overall, this area was rated 4.74 or strongly agree.

Interview Results from the Grade 4 Students

The students were asked about the usefulness and effectiveness of the *MathDali* program in improving their performance in mathematics.

The students were asked the following questions:

> *Q1. After several months of learning mathematics using the tablet device and the AVP, how much do you like/love now your subject? Why? (Pagkatapos ng ilang buwan na pag-aaral ng math, gamit ang iyong tablet at AVP, gaano mo na kagusto ngayon ang asignatura na ito? Bakit?)*

The students responded positively about learning mathematics using the tablet device:

> "Mas gusto ko na yung math, mas makakatulong ito sa mga batang adik sa gudget." (Student 1, A)
> "Gustong- gusto ko po kasi po ako ay natuto sa pamamagitan ng palalaro at panonood." (Student 5, A)
> "I became more familiar with the four basic operations in math. I can do it more easily." (Student 4, A)
> "Sobrang gusto ko po ito. Dahil mas madadalian kami sa pag-*add* at iba pa. Natuto kaming mag-ayos kapag pinag-aaralan namin at nilalaro ang mga games sa tablet." (Student 3, A)
> "Opo. Nakakatulong ang *tablet* dahil kapag meron kang math na mahirap pwede mo itong i-*calculate* at kapag meron kang *word* na hindi makita pwede mo itong hanapin sa tablet." (Student 7, B)
> "Sobrang gusto ko po ito. Dahil mas madadalian kami sa pag-*add* at iba pa. Matuto kami ng mag-ayos kapag pinag-aaralan namin at linalaro ang mga games sa tablet." (Student 8, A)
> "Opo. Nakakatulong ang *tablet* dahil kapag meron kang math na mahirap pwede mo itong i-*calculate* at kapag meron kang *word* na hindi makita pwede mo itong hanapin sa tablet." (Sudent 7, B)
> "Gustong-gusto ko ito dahil sa pamamamagitan ng tablet at AVP, ako'y matiyaga sa pag-aaral ng math." (Student 2, A)
> "Gusto ko ito dahil matutulungan ako ng *subjec*t na ito na mag-*solve* pag sa *math problem.*" (Student 6, A)
> "Gustong-gusto ko na ang math dahil ito ay lalo nang dumali."(Student 9,A)
> "Opo dahil maraming laro at mga *activities* sa tablet." (Student 13, B)
> "Gustong-gusto ko na ito dahil masaya ako kapag math ang gamit sa pinag-aaralan." (Student 12, B)
> "Math ang paborito kong subject dahil ito ay kailangan sa paglaki at masaya itong sagutan." (Student 11, A)

On the otherhand, some students gave a feedback like:

"Medyo gusto ko po ito dahil gumagamit po ako ng tablet; medyo ayaw ko din po dahil mabilis makalabo ng mata" (Student 8, B)

"Konte, kasi nahihirapan ako sa iba." (Student 10, B)

Q2. Did the tablet device help you to improve in your math subject? Did it make your performance better or not and in what way?(Nakatulong ba sa iyo ang tablet na ginagamit mo sa pag-aaral ng math? Sa paanong paraan ito nakatulong?)

The students responded on how the *Mathdali* tablet device helped in improving their performance:

"Opo, para sa *calculator* at yung ibang laro na pang math magda-*download* ng mga laro ng pang math." (Student 15, A)

"Opo. Nahirapan po ako sa math noong may minus at mag- divide pero naging marunong po ako at nakabisado ko po ang mga ito." (Student 14, A)

"Nakatutulong ang tablet na ginagamit ko sa pag-aaral ng math dahil meron itong *games* na math." (Student 19,A)

"Opo. Nakakatulong po ang tablet dahil ito ay may naitututlong ito satin dahil ito ay laro man ito ay may halong *Mathdali.* Maganda ito para satin." (Student 16, A)

"Nakakatulong ang tablet ko sa pag-aaral sa math dahil kapag meron kang iko-*compute* pwede mo itong *i-compute* sa tablet." (Student 18, A)

"Opo. Dahil ang tablet ang nagpapaalala ng mga aralin na matagal nang na-*discuss* ni teacher." (Student 21, A)

"Opo. Natulungan ako nito sa pamamagitan ng pagpapasaya sa aralin." (Student 20, A)

"Opo. Kasi po twing nagagamit ko ito ako ay nakakasagot." (Student 24, A)

"Opo. Dahil mas naintindihan ko ang math." (Student 22, Am

"Hindi. Dahil puro laro lang ang meron sa tablet." (Student 25, A)

"Opo. Dahil ang tinutulong niya sa akin ay para mataas ang aking marka." (Student 26, A)

However, one student responded:

"Yes, sometimes. But I enjoyed the activities included in the tablet."(Student 17, A)

Q3. What are your grades in the math subject? Did you get a high or low score/grade? In your opinion, why do you think did you get high or low scores? (Anu-ano ang iyong mga naging marka sa asignaturang math? Tumaas ba ito o bumaba? Sa iyong palagay, bakit kaya ito tumaas o bumaba?)

The students were asked about the status of their grades in math and what could be the reason behind it:

"Tumaas po ito, dahil ako ay nakinig ng mabuti habang nagle-*lecture* si *teacher*" (Student 8, A)
"Tumaas. Dahil ako ay nag-aral ng mabuti." (Student 12, A)
"Ito ay tumaas dahil lalo ko itong naintindihan." (Student 10, B)
"Mataas ang marka ko sa math, ito ay tumaas, ito ay tumaas dahil ito ay madali." (Student 10, A)

Many students answered that they got high grades; however, one student answered:
"Hindi ko pa po alam e, baka po bumaba ako."(Student 9, B)

Q4. What particular topic in math did you like best? And why? And what was the most difficult for you? (Anong particular na aralin sa math ang pinakanagustuhan mo?Bakit? Alin naman ang naging pinakamahirap para sa iyo? Bakit?

The students were asked which among the topics in math they liked best and which were most difficult:

"Ang *addition.* Iyon ay napakadali pero wala po akong pinakamahirap na *lesson."* (Student 1, B)
"Ang nagustuhan ko ay ang *PERIMETER* at ang pinakamahirap ay pag*multiply* ng maraming *number*." (Student 7, B)
"Ang pinakanagustuhan ko po ay medyo mahirap at ang pinakamahirap sa akin ay mahirap." (Student 6, B)
"Ang madali lang sa akin ay *plus* at *minus;* ang naging pinakamahirap sa akin ay ang *division* dahil hindi ko ito maintindihan." (Student 2, A)
"Angles ang madali, ang mahirap ay pagkuha ng *area*." (Student 3, A)
"Ang pinakagusto ko po ay *plus* at pinakamahirap naman sakin ay *divide*."(Student 5, B)
"Madali ang *addition* ; ang pinakamahirap ay *division*."(Student, 8, B)
"Ang pinakagusto ko ang *table* at *grape*r dahil napakadali nito at pinakamahirap naman sa akin ay *fraction* dahil ang *fraction* ay tigdadalawang *numero."* (Student, 10, A)
"Ang naging mahirap sakin yung mga area ng *square* at iba pa." (Student 9, A)
"Ang pinakamadali ay ang addition dahil ito ay pag a-*add* lang." (Student 12, B)
"Ang pinakagusto ko po ay pag a-*add* dahil madali lang sya at ang pinakamahirap ay *divide* dahil nakakalito." (Student 11, A)

"Ang pinakagusto ko sa *math* ay *addition* at *division*." (Student 16, A)
"Addition, Subtraction, Mainos, Divide." (Student 14, B)
"*Addition.* Ang pinakamahirap naman sa akin ay division." (Student 17, B)
"Ang pinaka madali ay multiplication at pinaka ayaw ko ay division." (Student 18, A)
"Pinakanagustuhan ko po ang *Chart,* nagustuhan ko ito dahil madali lang." (Student 21, B)

Some students answered:

"Ang unahan po na mga *topics* ay madadali at ang pinakamahirap po ay ang huling topic." (Student 4, A)
"Ang pinakanagustuhan ko ay pagdi-divide at walang mahirap." (Student 20, B)

Q5. Can math help you in your daily life? Will you please give an example? (Magagamit mo ba ang mga natutuhan mo sa math sa iyong pang-araw-araw na gawain sa buhay? Magbigay ng mga halimbawa.)

The students were asked how math could be of help to them in terms of their daily situation:

Most of them positively responded that:

"Opo, magagamit ko po. Ang magagamit ko sa math sa pamamagitan ng pagkokompyut ng mga pera sa alkansya." (Student 1, B)
"Opo sa pamamagitan ng pagbibilang ng pera, pagkain, at iba pa."(Student 4, A)
"Opo sa paggawa ng takdang aralin at iba pa." (Student 2, B)
"Opo, nakakatulong po ito sa pang-araw-araw kong gawain sa buhay. Katulad ng kung may nagtanong sa akin nga tungkol sa math masasagot ko ito agad." (Student 3, B)
"Opo, sa pagtitinda at pagsusukli."(Student 6, A)
"Opo, kapag po may pinapapabilang mabibilang ito sa pag-a-add, pag sa-s*ubtract* ng mga bagay. Mga oras para makita kung anong oras na pagmiminus at pag a-add." (Student 19, A)
"Opo, sa pagtitinda ng mga *candy* at iba pa." (Student 7, B)
"Opo, dahil may assignment pwede natin itong isali". (Student 8, B)
"Oo, ang *rounding off, probability, fraction* at iba pa." (Student 10, A)
"Opo sa pamamagitan ng pagbibilang ng ginagawa po." (Student 16, A)
"Opo, tulad ng pagkakalkuleyt." (Student 18, B)
"Oo, magagamit ko ito sa pagbabayad at pagsusukli." (Student 12, A)

"Oo, paglilito." (Student 14, B)
"Opo, magagamit ko po ito." (Student 13, B)
"Opo, kapag po bumili sa *Mall*." (Student 17, A)
"Opo, kapag po nahihirapan ka pwede mong magamit ang *Mathdali."* (Student 20, A)

Q6. Do you want to have a Mathdali Program for the next year for Grade 5? Why do you like it? Why not? (Gusto mo pa bang magkaroon ng Mathdali Program sa ikalimang baitang? Bakit oo? Bakit hindi?)

The students were asked if they want to have a continuation of this program:

"Opo, gusto ko po. Para po mas marami pa po kaming matutunan at marami pang kaalaman ang malalaman namin." (Student 19, B)
"Opo, para may matutunan pa kaming di namin alam." (Student 1, B)
"Opo, dahil mas mapapadali ang aming pag-aaral sa tulong nito." (Student 13, A)
"Para kami ay may matutuhan sa pagma-*math* namin; kaya may *math* dahil para tayo ay maturuan." (Student 16, B)
"Opo, upang ang grade 6 ay madali na para sa amin." (Student 1, A)
"Opo. Para madami kaming *activities* na gawain." (Student 8, A)
"Oo, dahil natutulungan ako nito sa pang-unawa sa asignaturang *math"*. (Student 14, A)
"Opo, gusto ko po dahil ang *Mathdali* ay masayang panoorin at maraming kaalaman." (Student 5, A)
"Gusto ko po dahil mas madali po iyon." (Student 18, B)
"Opo para po ako ay malibang." (Student 10, A)
"Opo gusto ko dahil masaya itong gamitin." (Student 5, B)

Some, very interesting answers from the students were:

"Hindi po dahil baka po lumabo ang mata ko." (Student 21, A)
"Ayaw, dahil hindi pa ako handa sa *Mathdali Program*." (Student 7, A)

Q7. Do you have any recommendation or suggestion to show appreciation for the success of our Mathdali Program? (Mayroon ka bang mungkahi o suhestiyon upang lalong maging maganda at matagumpay ang Mathdali Program?)

The students were asked to cite any recommendation or suggestions for the success of this program:

"Ang saakin po ay pagbutihin ang *Mathadali Program* at magdagdag pa ng ibang magagandang bagay o *lesson* na matutunan."
"Ang mungkahi ko o suggestion upang lalong maging maganda at matagumpay ang *Mathadali Program* ay mas pagalingin pa nila ang *Mathadi Program."*
"Mag-re-*review* ako para matagumpay ang *Mathadali Program."*
"Opo, mag*review* muna para maging maganda at matagumpay."
"Opo, para ito ay mapadali sa atin."
"Wala po, dahil okay na ito at madali na."
"Wala po, kasi po, maganda at matagumpay na po ang *Mathadali Program."*

Very significant suggestions were:

"Opo, dapat turuan din nila ang ligaw na bata."
"Opo, sana po ay magkaroon pa ng maraming *Mathdali;* sana hanggang Grade 10 po."
"Maglagay po tayo ng mga card na paglalarawan tulad ng mga pag-*add*, pag*su-subtrac*t, pagmu-*multiply*, pagdi-*divide* para mas matututo ang ibang gagamit ng *Mathdali.*"

Interview Results from the Mathematics Teachers

Questions for the teachers who underwent training in math and *Mathdali* program.

Q1. Do you think attending Mathdali training helps you as a teacher in math? What benefits have you gained from this? (Bilang isang guro sa math, nakatulong ba sa iyo ang pagdalo sa mga training ng Mathadali Program? Anu-ano ang naitulong sa iyo sa pagtuturo?)

Teachers were asked if attending training in *Mathdali* helps them to deliver well in teaching the subject:

"As a math teacher, the training I had attended on *Mathdali* program gave me more knowledge, concepts, and strategies in teaching the subject (Teacher 1)
"Attending the *Mathdali Program* made me more knowledgeable and become updated on the modern techniques in teaching math. Teaching the subject was made easier and enjoyable. (Teacher 3)
"Opo. Nakapagbigay ito ng mga bagong kaalaman upang mas mapadali ang pagtuturo ng math." (Teacher 2)

"Opo, Nakatulong ito upang lalo pang maging interasado ang mga bata sa pag-aaral ng math. Mas lalo nilang maintindihan ang konsepto ng mga aralin sa mga *visual aids* na kanilang nakikita." (Teacher 4)

"Oo, nakatulong rin ito sa aking pagtuturo, lalo na sa mga stratehiya na maari kong gamitin upang madali kong maisalin sa madaling paraan ang konsepto ng aralin sa math." (Teacher 5)

Q2. Do you have other strategies to teach math after the training? Give some examples of knowledge you learned. (Nagkaroon ka ba ng higit na kaalaman sa iba't ibang pamamaraan sa pagtuturo ng asignaturang math pagkatapos ng training? Magbigay ng halimbawa ng kaalamang natutunan.)

The teachers were asked about strategies which can be applied after attending the *Mathdali* training:

"I learned the concept attainment strategies (CAS), conscience tunnel, use of models, L bars, and number blockbase 10 blocks" (Teacher, 3)

"I learned how to teach math lesson the easy way; examples: lessons on getting the area of circle and areas of polygons; fractions, etc." (Teacher 1)

"Natutunan ko ang iba't ibang paraan kung paano maituturo ng mas madali ang bawal aralin sa math." (Teacher 2)

"Opo, Halimbawa po nito ay ang paksa tungkol sa fraction. Sa pamamagitan ng itinuro nilang pamamaraan mas madali nila itong naunawaan." (Teacher 4)

"Oo, nagkaroon ako ng mas higit na kaalaman dito, tulad ng mga ibinigay na halimbawa sa maling pagtuturo sa math (error). kailangan pala na habang itinuturo ang math may mga *visual or real objects* na magpapaliwanag na ito ang katumbas na kahulugan nito." (Teacher 5)

Q3. Can you say that Mathdali Program is much more interesting to teach? Why? (Masasabi mo ba na dahil sa Mathdali Program ay mas naging higit kang interasado na ituro ang asignaturang ito? Bakit?)

The teachers were asked if *Mathdali* Program is much interesting to teach:

"Opo. Sa tulong ng program ng *Mathdali* higit akong naging interasado sa pagtuturo ng math dahil nadagdagan ang aking kaalaman kasabay ng aking kompiyansa sa sarili." (Teacher 4)

"Opo, sapagkat ang aking pagdalo sa training ay naging hamon para sa akin na ituro ang asignaturang math gamit ang mga pamamaraan na aking natutunan para sa ikatututo ng mga mag-aaral."
"Yes, I became more interested in teaching the subject." (Teacher1)
"Opo, sapagkat may nagagamit na kaming gabay sa pagtuturo." (Teacher 2)
"I realized that it is not difficult to teach math with the enjoyable activities presented and included in the AVP." (Teacher3)
"Para sa akin nagiging mahirap ituro ang math lalo na kung ito ay nangangailangan ng malalim na pang-unawa na maitututuro sa mababaw at madaling maintindihan." (Teacher 5)

Q4. What changes do you see or feel in yourself because of Mathdali Program? (Ano-anong mga pagbabago ang nakita mo o naramdaman sa iyong sarili dahil sa Mathdali Program?)

Teachers were asked if they see or feel changes in themselves because of *Mathdali*:

"I am more motivated to teach the subject in an easy way." (Teacher 1)
"Mas lalong napamahal sa akin ang asignaturang ito at nadagdagan ang tiwala sa sarili na ituro sa mga mag-aaral." (Teacher 2)
Naramdaman ko na mas naging interesado akong magturo ng math. (teacher 5)
"Because of the strategies and techniques I have learned from the training, I am much confident to teach my lesson."
(Teacher 3)
" Hindi pala mahirap ituro ang math lalo na kung natutuhan mo na ang mga simpleng techniques na kayang matutuhan ng mga bata. Hindi ka na nila sasabihan ng I "hate" math. (teacher 4)

Q5. Which lessons in math do you find difficult to teach? Why? (Alin sa mga aralin sa math ang nahihirapan kang ituro? Bakit?)

Teachers were asked which among the lessons in math is dificult for them to teach:

"From the lessons included in the subject, I think Fractions, Circle and Finding the unknown angle, seemed to be difficult for me. It's really hard to teach these topics." (Teacher 3)
""Proving in Geometry." "Proving triangle congruence (Congruent), and geometry problems are somewhat difficult because you have to memorize theories and postulates." (Teachers 1 & 5)
"Word problem about fractions." (Teacher 4)

A very significant answer from the teacher was:

"Wala, dahil ang mga aralin sa math ay simple lang at madali pang ituro." (Teacher 2)

Q6. Do you see any progress in learning math among your students? What changes have you noticed? (Sa iyong mga mag-aaral, nakitaan mo ba sila ng pag-unlad sa pagkatuto? Ano-ano ang mga pagbabagong napansin mo?)

Teachers were asked if they observed progress on their student's performance in learning math.

"Students showed more interest in learning math, particularly in watching educational games and the AVP." (Teacher 2)
"Many students participated in the discussion and activity. They also think critically for the solution to the problems." (Teacher 1)
"Opo. Nakita ko sa kanila na marami silang natutuhan sa math." *(Teacher 3)*
"Opo, naging masigasig sila sa kanilang pag-aaral." (Teacher 5)

One teacher responded:

"Hindi naman sa lahat ng bata makikita na meron progress although they are really striving to become better in the subject." (Teacher 4)

Q7. Were the trainings you had attended enough for you or you want some more? (Sapat na ba ang training na iyong nadaluhan o nais mo pa itong madagdagan.)

"I think now it's enough but we want to ask for more so we can upgrade concepts and strategies needed for teaching math." (Teacher 3)
"For me, I want to add more gaming trainings so we can familiarize more in this area." *(Teacher 2)*
"I want to request for more additional trainings in teaching math." (Teacher 1)
"Sa aking palagay dapat pa na dagdagan ang gaming training." (Teacher 5)
"Sapat na po ito." (Teacher 4)

Q8. Would you like to recommend Mathdali to be pursued and to help our students and teachers in math? Why? (Nais mo bang irekomenda ang Mathdali Program na ipagpatuloy upang makatulong sa mga mag-aaral at sa mga guro na gustong lumawak ang kaalaman sa math? Bakit?

Teachers were asked if they want to continue with the program for the benefit of the students and teachers:

"Yes, I would like to recommend *Mathdali* Program to be continued for the benefit of both students and teachers." (Teacher 1)
"Opo. Sapagkat ang *Mathdali Program* ay nakatutulong sa mga guro at sa mga mag-aaral na mas maunawaan ang kahulugan at gamit ng math sa pang-araw-araw na pamumuhay." (Teacher 2)
"Opo. Upang wala nang mag-aaral na magsasabi na "I Hate Math." (Teacher 3)
"Opo. Upang mapagtanto nila na hindi naman talaga mahirap ang math*."* (Teacher 4)
"Oo, dahil malaking tulong ito sa mga guro at bata na mayroong kahinaan sa pagkatuto at pagtuturo ng math." (Teacher 5)

Q9. Do you have any recommendation or suggestion for the success of Mathdali Program? (Mayroon ka bang mungkahi o suhestiyon upang lalong maging maganda at matagumpay ang Mathdali Program?)

Teachers were asked what they would like to recommend or suggest for the success of the program:

"I suggest that *Mathdali* Program be continued up to the next grade level of the students for continuity of the knowledge. More additional trainings for the *Mathdali* teachers." (Teacher 1)
"More monitoring and supervision be conducted during the school year." (Teacher 2)
"It maybe better if the program would start in Grade 1." (Teacher 3)
"More time in the training of teachers and give additional time in teaching the subject." (Teachers 4 & 5)

SOP4. Present the challenges in the utilization of design as perceived by the teacher being a facilitator

An interview was conducted with the teacher in-charge of the *Mathdali Program* and she was asked the following questions:

Q1. What problems have you experienced as a teacher of math following the Mathdali Program? (Anu-anong mga balakid o suliranin ang naranasan mo sa pagiging guro ng math alinsunod sa Mathdali Program?)

a. Problems on the students

She mentioned, *"There is no problem among my students; all of them showed interest in the lessons. Most of them are really focusing on our discussion in math and the Mathdali activities"*

b. Problems on Gadget/ Tablet/ AVP

Teacher firmly noticed, *"The tablet device battery drains easily. Although all students are really engaged once activities are to be held using the tablet."*

c. Problems on time

According to the teacher in-charge, *"All the lessons that are included in the program were properly executed on time."*

Q2. Were all the lessons included in the mathematics Grade 4 curriculum taught? If not, what are the reasons? (Naituro ba sa mga mag-aaral ang lahat ng mga aralin na nakapaloob sa kurikulum na Math - Grade IV? Kung may mga araling hindi naituro, ibigay ang mga dahilan.)

The teacher mentioned, *"Ang lahat ng lesson ay naituro."*

Q3. Do you think that using the tablet device helped increase the knowledge of your students in math? If yes, how? (Natulungan ka ba ng paggamit ng tablet upang mapalawak ang kaalaman ng mga mag-aaral sa math? Kung oo, paano?)

The teacher emphasized, *"I think yes. Ito ay nakatulong. Naging madali ang pagpapaintindi sa mga bata lalo na sa mga araling kumplikado. At mas madaling makuha ang kanilang atensyon gamit ang mga makabagong kagamitan"*

Q4. Did you observe active participation from your students while they were using the tablet device? How? (Nakitaan mo ba ng mas aktibong partisipasyon ang mga mag-aaral gamit ang tablet? Paano?)

She expressed, *"Yes, my students became more active and participative with the use of their tablet. They shared their knowledge to their classmates and could answer questions during the class discussion"*

Q5. Have you observed great and positive changes in teaching math? What are these changes? (Nakitaan mo ba ng malaki at magandang pagbabago ang asignaturang math? Ano ano ang mga pagbabagong ito?)

She positively responded, *"Yes, I have observed changes in terms of how my students easily understood and enjoyed math activities. They became more active and participative in the discussions. They were excited and motivated about our next meeting's lesson.*

Q6. If given a chance to have a continuation of this project or program, would you still consider to be the teacher in-charge under Mathdali program? Why? (Kung ipagpapatuloy ang proyektong ito, nais mo pa bang maging kasama sa Mathdali Program? Bakit oo o hindi?

She strongly remarked, *"If given a chance to be part again of this program, I would still consider to be the teacher in-charge because I enjoyed teaching my students and at the same time I also learned new concepts and techniques in teaching the subject. I would like, though, that other teachers should experience being in the program and enjoy the same benefits that I gained from this program."*

Q7. Do you have any recommendations or suggestions for better improvement and success of the *Mathdali* Program? Mayroon ka bang mungkahi o suhestiyon upang lalong maging maganda at matagumpay ang *Mathdali* Program?

a. On using the tablet

The teacher pointed out, "Sana ang *device tablet* ay hindi agad nauubusan ng baterya at hindi naghahang."

b. On teaching the subject *math*

She strongly revealed, *"I think in terms of teaching, I am very satisfied with the program. The program, including the trainings that I have attended, helped me a lot in handling the subject. I wish that this will continue for the next cohort or on the same batch for Grade 5. I also feel that more trainings should be given to the teachers to become more competent in teaching the subject.*

c. On the students

The teacher described, *"I really noticed that my students, if not all, at least 99% enjoyed their math subject and I think that is because of the Mathdali activities. At the same time, most of them improved thei performance in math."*

Conclusions

Based on the findings presented, the following conclusions were made:

1. It was noted in the performance of the Grade 4 students that most of them became more proficient in mathematics. In the comparison of their prestest and posttest scores, most of their scores in the posttest exceeded their scores in the pretest.

There was a significant increase in the posttest performance of the Grade 4 students in the difficulty index of the items in the tests.

2. Most of the students showed a positive impression on their *Mathtitudes* level before and after taking the math subject and the *Mathdali* Program.
3. Most of the students strongly agreed that mathematics became an interesting subject because of the help of *Mathdali* gadget which is the tablet device. They also showed positive feedback on the use of the tablet during the interview. The gadget helped them improve in their performance in the subject; they received high grades; they enjoyed the subject; and the subject became easy for them. Most of them also agreed that they learned a lot from the program.
4. For the teachers, most of them agreed that the training helped them to become more competent and positive in teaching the subject. They learned new concepts and strategies which can be used for their teaching methods. Most of them felt that they are now more motivated and interested in helping their students to learn mathematics.
5. On the challenges in the utilization as perceived by the teacher-facilitator, the teacher strongly agreed that *Mathdali* Program really helped the students especially in understanding concepts and techniques used in the subject. It was all pointed that students became more active and participative in class discussions. Most of the students enjoyed the math subject because of the *Mathdali* Program.

Recommendations

The following recommendations are being presented:

1. Test items included in the pretest and posttest should be improved. Validated tests from the division office of Bulacan should consider revision of the content and revalidation of the test items.
2. Teachers in-charge of the construction of the test items to be included in the exams should be involved.
3. Interactive and innovative teachers' training should be given to the mathematics facilitators.
4. All lessons / topics should be included in the tablet device for the alignment in the grade four curriculum guide.
5. Inclusion of the competencies required for the Grade 4 math curriculum should be considered.

6. Assistance and guidance on the use of the tablet device should be considered especially for those stduents who are not familiar with the gadget.
7. English proficiency versus math proficiency levels of the students may be considered for future research.
8. Monitoring and supervision on the implementation of the program should be undertaken for the whole year.
9. A follow up of the *Mathdali* project for Grade 5 may be considered or an assessment of the same cohort during their Grade 5 in math for comparison purposes may be done.
10. Experimental groups for the next batch of the students should be formed.
11. An improved version of the tablet device may have to be considered.

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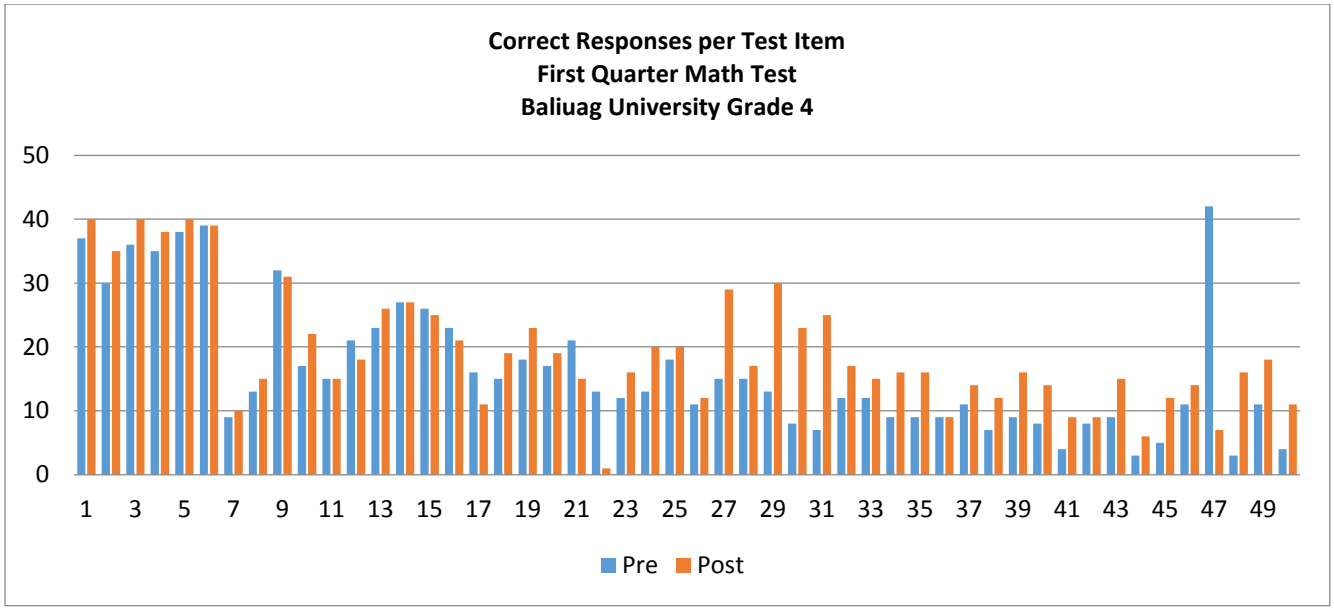
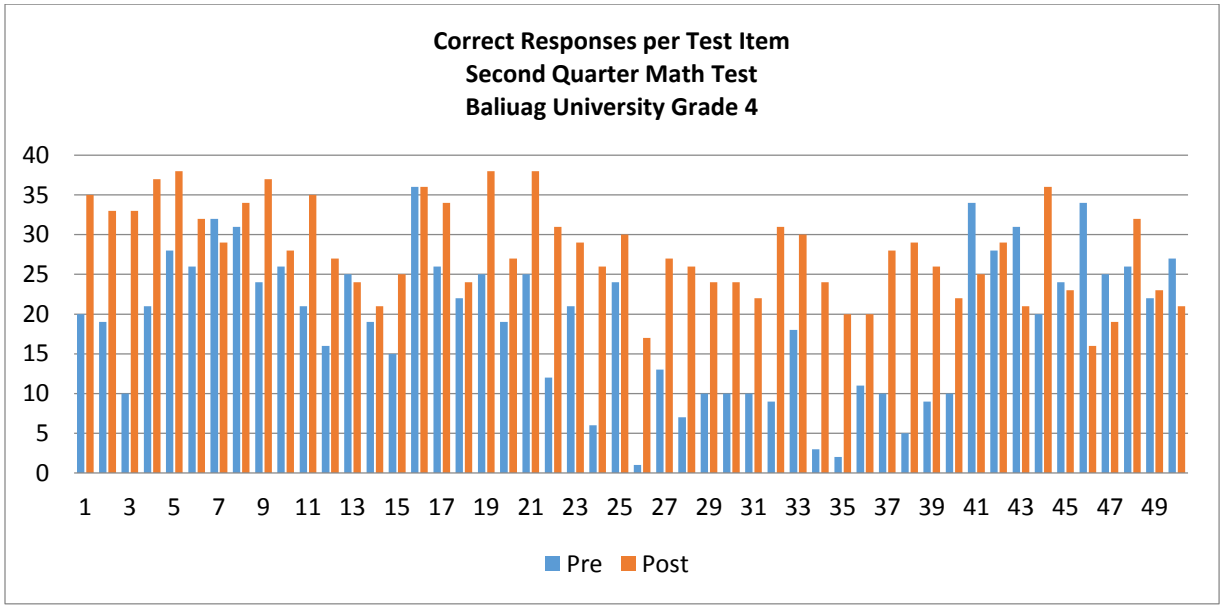
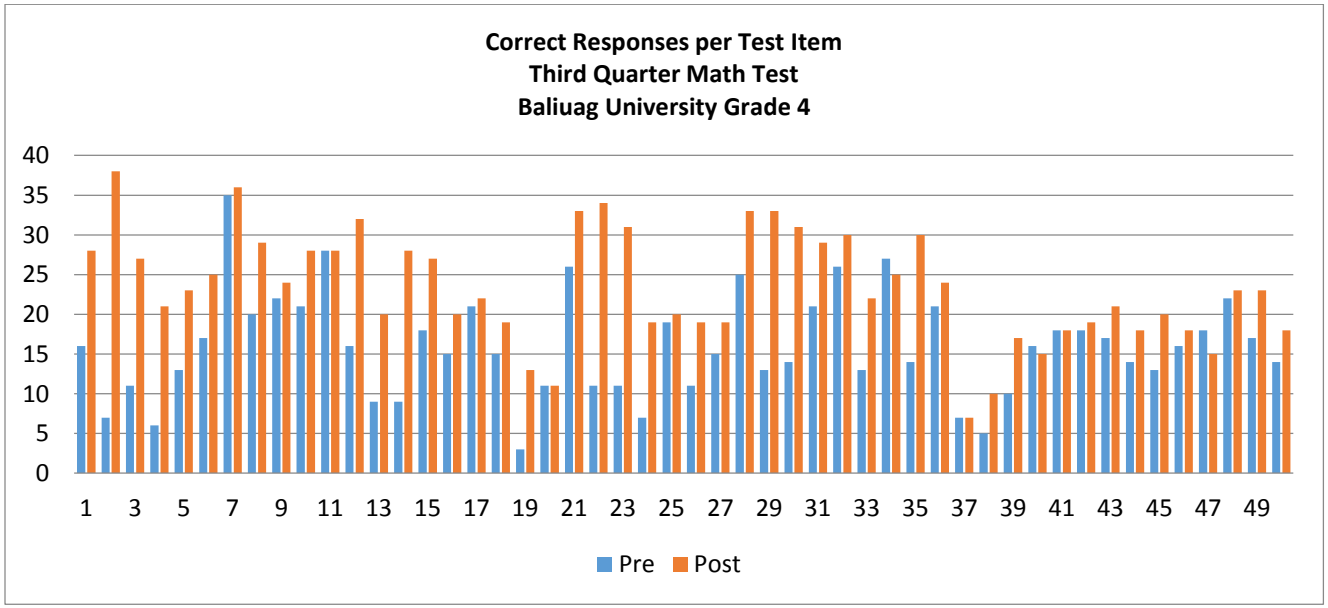
Appendix A: Tentative Time Table

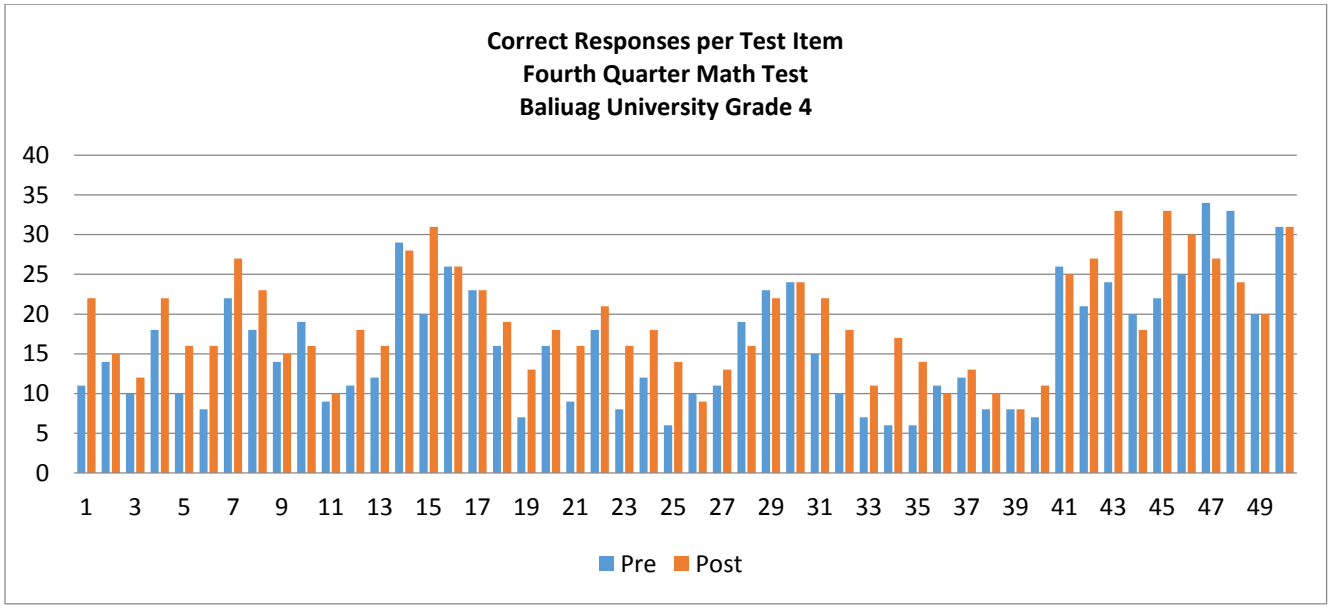
June 19-23	Pretest (First Quarter)
August 7-11	Posttest (First Quarter)
August 14-18	Quarter Exam
August 21-25	Pretest (Second Quarter)
October 16-20	Posttest (Second Quarter)
October 23-27	Quarter Exam
November 6-10	Pretest (Third Quarter)
January 8-12	Posttest (Third Quarter)
January 15-19	Quarter Exam
January 22-26	Pretest (Fourth Quarter)
February 19-23	Teacher' Evaluation
March 19-23	Posttest (Fourth Quarter)
March 26-29	Quarter Exam

Appendix B: Correct Responses per Test Item

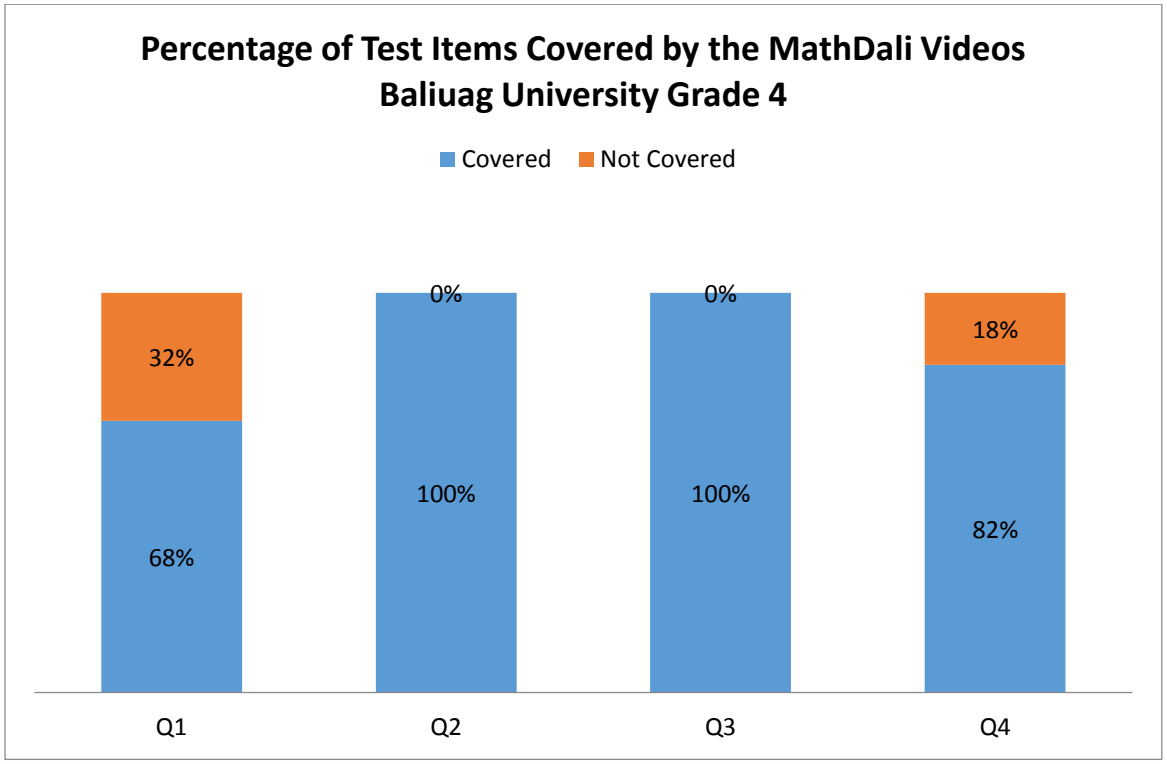



Correct Responses per Test Item
Second Quarter Math Test
Baliuag University Grade 4
40
35
30
25
20
15
10
5
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49
Pre
Post

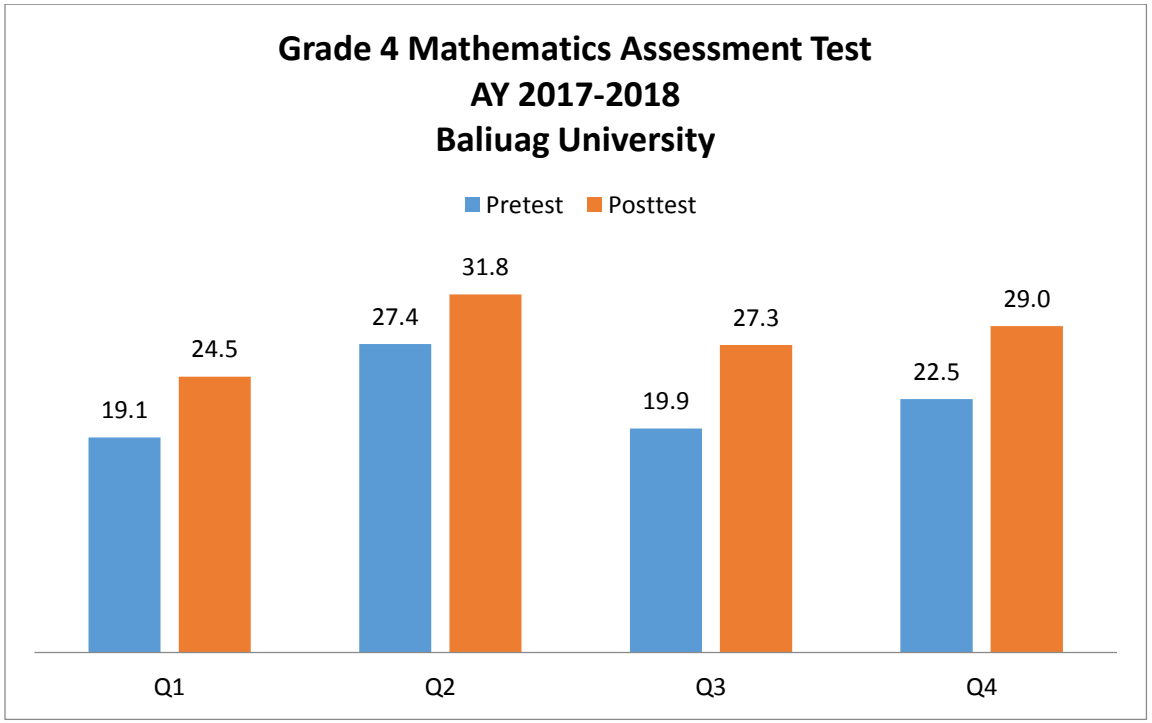

Correct Responses per Test Item
Third Quarter Math Test
Baliuag University Grade 4
40
35
30
25
20
15
10
5
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49
Pre
Post


Correct Responses per Test Item
Fourth Quarter Math Test
Baliuag University Grade 4
40
35
30
25
20
15
10
5
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49
Pre
Post

Appendix C: Percentage of Test Items Covered by the MathDali Videos Baliuag University Grade 4



Appendix D: Grade 4 Mathematics Assessment Test



Appendix E: Percentage of Passers Grade 4 Mathematics Assessment Test