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Prueba de práctica diaria: efectos sobre el rendimiento matemático en la resolución de operaciones fundamentales en fracciones

Daily practice test: effects on mathematics performance in solving the fundamental operations on fractions

Jun Carl Alenton.
University of the Philippines Cebu.
jbalenton@up.edu.ph

RESUMEN.
Este estudio experimental evaluó los efectos de implementar la prueba de práctica diaria en la resolución de operaciones fundamentales en fracciones como una de las deficiencias de los estudiantes de matemáticas. Además, los resultados de las pruebas de rendimiento revelan que una de las debilidades de los estudiantes es el dominio y la fluidez computacional para resolver problemas que involucran fracciones. El estudio tuvo como objetivo comparar las pruebas diarias y la revisión convencional como una herramienta para dominar los conceptos que involucran fracciones. Esto se realizó a través de la prueba previa y posterior en el rendimiento de los estudiantes antes y después de estar expuestos a las pruebas diarias. Los encuestados se agruparon según la revisión convencional y un grupo expuesto a las pruebas diarias durante ocho semanas. Dos clases distintas; Los grupos experimentales (n = 75) y de control (n = 75) fueron elegidos al azar. Los resultados revelaron que los estudiantes en ambos grupos mostraron un rendimiento por debajo del promedio en la prueba previa, pero manifestaron una diferencia significativa en la media real en la prueba posterior. Ambos grupos mostraron una mejora significativa en la resolución de operaciones fundamentales en fracciones. Además, el logro de los estudiantes bajo la Prueba de práctica diaria mostró un rendimiento superior al promedio y ayudó significativamente a mejorar el dominio de los estudiantes para resolver las operaciones fundamentales en fracciones. El documento concluye que las pruebas diarias tienen un impacto positivo en el dominio de los estudiantes y han mostrado una mejora en sus hábitos de estudio como se evalúa con frecuencia.

PALABRAS CLAVE.
Evaluación, Educación, Pruebas frecuentes, Rendimiento matemático, Pedagogía.

ABSTRACT.
This experimental study evaluated the effects of implementing the Daily Practice test in solving fundamental operations on fractions as one of the deficiencies of students in Mathematics. Moreover, achievement test results reveal that one of the weaknesses of the students is mastery and computational fluency in solving problems involving fractions. The study aimed to compare daily testing and conventional review as a tool to master concepts involving fractions. This was made through the pre-posttest in the students' performance before and after being exposed to daily testing. The respondents were grouped according to conventional

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review and a group exposed to the daily testing for eight weeks. Two distinct classes; experimental (n=75) and control (n=75) groups were randomly chosen. The results revealed that the students in both groups showed Below Average performance in the pretest but manifested a significant difference in the actual mean in the post-test. Both groups displayed significant improvement in solving fundamental operations on fractions. Further, the achievement of students under the Daily Practice Test showed Above Average performance and significantly helped in the improvement of students' mastery in solving the fundamental operations on fractions. The paper concludes that daily testing has a positive impact on students' mastery and have shown improvement in their study habits as tested often.

KEY WORDS.
Assessment, Education, Frequent Testing, Mathematics Performance, Pedagogy.

1. Introduction.

A strong foundation in learning a simple concept is the key to understanding abstract ideas. This process develops critical thinking, which is vital in learning Mathematics as it is the core of the K to 12 conceptual frameworks in Mathematics (K to 12 Curriculum Guide, 2012). Critical thinking is defined as self-directed, self-monitored, and self-corrective thinking. People who think reason critically rationally because they have established an understanding of nature and the roots of the problems. (Foundation for Critical Thinking, 2013). In line with the desired skills in Mathematics, there is a need for students to establish a critical thinking process in order to become highly skilled in the subject (Cavendish, 2013). Students who think critically in Mathematics have developed this skill by mastering the basic concepts. Teachers are then much challenged to develop students' full understanding of the basic arithmetic in Mathematics and enhance their self-confidence in solving problems. Studies have shown that the actual level of student performance in Mathematics appeared much to be far from the desired level. According to the National Achievement Test Results, the average mean percentage score (MPS) of the Fourth-Year students taking Mathematics from school year 2004 to 2006 and for the school year, 2011- 2012 has been observed to deteriorate from 50.70%, 47.73% to 46.37%, respectively. The similar achievement level in Mathematics falls under the low mastery level with 59.09%, and the mean percentage score of Region 7- Central Visayas is 56. 8%, lower than the other regions.

Results reveal that one of the weaknesses of the students in solving problems is fractions. This weakness in fractions has caught the attention of Mathematics teachers and educational researchers (de Castro, 2008). Studies showed that high school students' knowledge of fractions significantly correlates with the students' overall Mathematics achievement (Siegler, Bailey, Zhou, & Fazio, 2013). Thus, it is a need for students to master solving fractions. In order to fully understand the concept of fractions, students must first complete the concrete stage (Bush & Karp, 2013; Bentley & Bosse', 2018). The common misinterpretation of the mathematical operation on fractions occurs because it is not consistent with the counting principles that apply to whole numbers to which students often relate. Even 10th Graders have a hard time calculating and solving problems that involve fractions (de Castro, 2008). The lack of practice with both fraction concepts and fraction computation before entering the Ninth

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Grade is an alarming problem that must be addressed by the teacher. Students must also be given enough time to master and develop fraction concepts and computational fluency (Mohamed, Teoh, Singh, & Kor, 2019).

To address this problem, Dios (2013) suggested frequent testing and improvement of study habits. Giving tests often in class provides a venue for students to study habitually and so they remember the concepts easily. Also, Willingham used retrieval practice as giving frequent tests to engage and enhance learning. It has been recognized as an effective strategy for enhancing long-term classroom learning (Willingham, 2013; DepEd, 2015). Classroom assessment is an integral part of the curriculum for it evaluates the effectiveness of the teaching methodology and instruction, and it monitors the pacing of the learners' progress. With the use of appropriate classroom assessment techniques, the teacher increases students' motivation and correspondingly assist them in mastering the topic.

2. Review of Related Literature.

2.1 How perplex is fraction to high school learners?

Fraction is one of the keys to understand Algebra better, but many students have a hard time understanding the process of solving fractions. Researches have shown that students were struggling to learn the concept of fractions and operations on fractions (Bentley & Bosse', 2018; Mohamed et al., 2019; Unlu & Ertekin, 2012). As students associate the properties and characteristics of fractions with other numbers and apply the same rule, which resulted in misconceptions (Siegler, Bailey, Zhou, & Fazio, 2013; Bush & Karp, 2013). Many errors that students commit in elementary algebra are due to a lack of mastery in solving the fundamental operations on fractions. It is supported that the success in learning algebra and the development of algebraic thinking came from the firm foundation of learning rational number operations (Alghazo & Alghazo, 2017; Brown, 2007). Torbeyns et al. (2014) define fractions as the ratio of two whole numbers with the numerator and the denominator. It is more complicated compared to the concept of operations on integer due to their numbers of steps. Teaching fractions in mathematics classes needs a full attention because of their complex solutions and rich concept (Deringol, 2019). One example is when adding and subtracting fractions with the same denominator, the denominator is retained in the answer, but that is different for multiplying and dividing fractions (Siegler, Bailey, Zhou, & Fazio, 2013). The difficulty and similar weaknesses extend to college students and even adults (Siegler, Bailey, Zhou, & Fazio, 2013). It was considered that fractions play a vital role in learning different branches of Mathematics. Undeniably, fractions are significant in Mathematics as it is used in Algebra and higher mathematics (Torbeyns, Schneider, Xin, & Siegler, 2014).

2.2 Testing and Daily Testing.

Testing is highlighted in this study because it is a powerful means of improving learning (Bayat, Jamshidipour, & Hashemi, 2017). While testing, a student may learn or retrieve learned information through mental processes that work on the memory (Yigit, Kiyici, & Cetinkaya, 2014). Another importance of test is its direct effect on retention and its indirect effect, like the increase of study activities (Adkins & Linville, 2017). Regular assessment can improve the academic standing of the students and could help boost confidence, which results in students'

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active participation in class and a positive view of the teaching and learning process (Wolf, 2007). Regular assessment should also focus on topics where students have difficulty understanding and concepts that need remediation. The learning process is strengthened when students can effectively relate concepts to their previous experiences and can construct their understanding (Brown, 2007). For fundamental operations on fractions, students already have previous knowledge about it, and it can still be improved and developed through a long chain of activity (daily testing) that bridges the concrete concepts to abstraction. These connections fill in all gaps in forming new learning (Waite, 2007).

There are three strategies that the teacher must do in teaching fractions (Brown, 2007). The first strategy is to allow students to construct their ways to operate fractions rather than memorizing the process. Brown (2007) stated that forcing a child to learn the concept which is not suitable for the learners' cognitive level will only lead to rote learning without real understanding. In frequent testing, it enables students to construct their understanding of the concept while the teacher's role is to process meaningful student invented solutions. It also allows teachers to correct the errors of the students and provide them with the idea of what they are expected to learn (Drowns, 1986). Besides, students solve and get the chance to evaluate their solution (Waite, 2007). The second strategy includes the involvement of problem-solving in teaching fractions. This enables students to relate to the topic and to understand the concept of fractions better (Cavendish, 2013). The last positive strategy in teaching fractions is to extend the time to learn the topic. Studies have shown positive results when learners are given ample time to reflect and develop their reasoning skills towards solving arithmetic on fractions. Students extend their time learning fractions through the daily test. The use of frequent testing is beneficial for students as it can boost their confidence, improve their academic performance, and helps in the teaching and learning process (Pennebaker, Gosling, & Ferrell, 2013; Drowns, 1986; Waite, 2007; Wolf, 2007; Deck, 1998; Felderman 2014). Wolf focused on the term regular assessment. Regular assessment is giving uniform intervals in administering tests like on a weekly, bi-weekly, or even daily basis. The study is in the form of a written test. Yigit et al. (2014) added that exposing students to backup practices has a positive effect on remembering previously learned information regardless of the type of practice.

The question of the effectiveness of frequent testing in a course has been researched and debated by many for a long time. Kwan (2011) found some disadvantages in the study, like students might develop test anxiety. Horwitz and Young (1991) defined test anxiety as a type of performance anxiety resulting from fear of academic evaluation setting. However, this was addressed in the paper properly by setting clear objectives and focusing on the holistic goal of learning fractions. This was supported by Drowns' (1986) meta-analysis study about frequent testing. The study focused on the effects of frequent testing on academic performance, knowledge retention, and students' preference. Drowns used 16 variables in identifying the most compelling studies, which included testing procedures, classroom setting, and experimental designs in varied subjects and year level; six studies do not show any improvement, three resulted in no difference and seven yielded a positive result, which allowed students to improve in their academic performance. Students find it easy to study on shorter tests on smaller coverage with more regularity and chunked concepts (Waite, 207;

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Drowns, 1986) and instruction compared to more extended tests with broader coverage. Similar studies were conducted, especially in the field of Mathematics. Zgraggen used two levels in the study, Algebra 1 and Algebra 2. The experimental group focused on the biweekly exams, and the control group focused on the weekly exam. The result revealed that for both the experimental group in Algebra 1 and Algebra 2 performed better on the final exam and the retention test compared to the control group (Zgraggen, 2009). Frequent testing was effective in both the retention of course material and students' performance in final exams (Felderman, 2014; Roediger, Putnam, & Smith, 2011)

Across other subjects, similar researches on frequent testing were also used to measure effectiveness towards the subject. Like in Waite's study on weekly quizzing using Online Software and in Momeni and Barimani on language proficiency. As for Momeni and Barimani, the study used frequent testing in Iranian Pre-intermediate EFL learner's language achievement. Based on the result of the study, frequent testing significantly improved the language achievement of the respondents (Momeni & Barimani, 2012). A comparable result was supported by Waite, as it also improved significantly the academic performance of those who were taking the weekly quizzes than those who did not have any weekly quizzes at all (Waite, 2007).

The quote "practice makes perfect" suggests that students learn more if they practiced regularly (daily). With this and the positive effects of frequent testing, as mentioned in the previous studies, the researcher led to validate such claims in the form of this paper.

2.3. Theories that support Daily Practice Test.

The study was anchored on four theories: John Dewey's Learning by Doing Theory, B.F. Skinner's Operant Conditioning, Demspter and Farris's Spacing Effect Theory, and Siegfried Engelmann's Theory of Direct Instruction.

Learning by Doing is one of the most popular principles used by many for a thousand years (Reese, 2011). John Dewey's Learning by Doing Theory emphasizes the involvement of the students in the learning process, where students have the venue to participate and spend time, effort, and energy on the given task (Dewey, 1938). Learning by doing means learning from one's experiences, whether the outcome is positive or negative (Reese, 2011). For students to retain an understanding of a specific topic, practice must be done often. Frequent testing provides a venue for students to do the task in order to recall concepts and improve academic performance (Drowns, 1986). In doing the task, time is needed for students to develop learning. Dempster and Farris's Spacing Effect theory focused on the amount of study time needed by students for a specific topic (Dempster, 1981). Forcing the students to maintain a regular study schedule by frequent testing is supported by spacing effect theory. According to Adkins & Linville (2017), if students have the idea that they are tested regularly (weekly, or even every class period), they are observed to review and study more.

Another theory that supports frequent testing is B.F. Skinner's Operant Conditioning Theory. The more students performed well in the regular assessment, the more students become motivated to study harder and get good grades (Wolf, 2007). In Operant Conditioning, behavior is said to be controlled by the outcome or the consequences (Staddon & Cerutti, 2002). A reinforcement through good scores make students answer test correctly, and over

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time this result develops into a habit. In addition, students wait until they received a negative stimulus to strive more to get the desired behavior and monitor learning (Schugel, 2016). Moreover, learning by doing plays a significant role in this study, as Reese (2011) pointed out, in learning by doing students participate and are actively involved in the learning process. Direct instruction which is anchored on the theory by Siegfried Engelmann is also evident in this study. This theory focuses on the teacher giving reviews and discussion to reinforce learning while students are listening and are given a chance to participate through verbal response and board work. Direct Instruction is also found out to be effective in getting the attention of the students, engaging them in the discussion, and improving their academic performance (Magliaro, Lockee, & Burton, 2005).

3. Methodology.

3.1. Participants.

This study was conducted in a private school in Cebu City, Philippines. It is located near the urban areas of Talisay City Cebu. It is a private school accredited level III Institution by the PAASCU. The subjects of this study were the Grade 7 students of the said school. Students were randomly assigned in each section except for the pilot class. Students under the pilot section was not included in the data to avoid bias. The four sections that were included in the study were heterogeneous as classified by the guidance counselors of the school. Each section had 46 students. In choosing the participants for the control and experimental groups, a simple random sampling was conducted to choose which sections belonged to the control group and which section belonged to the experimental group.

3.2. Instruments.

There were two sets of instruments used in this study. A 16-test item covering the fundamental operations of fractions which consists of 8 items for short answer that requires actual solving and eight items for problem-solving. This was adapted from the California Standards Tests and validated by the educational head- coordinator in Maryland, USA. Series of revisions were made before it was approved and was used during the actual conduct of the study. The reliability of the questionnaire was tested using the test-retest method and had a reliability coefficient of 0.83. The second instrument was a 5-item test used on the daily practice test. The 5-item test was used for the duration of 8 weeks. It contains 4 problems involving direct solution and one problem solving. The test items and examples about fractions varied every day. The one sample z-test was used to determine the pretest and posttest performance of the control and experimental group, the paired sample t-test was used to determine the mean gain from the pretest to the posttest performance of both groups, and the independent sample t-test was used to determine the difference in the mean gain between the control and experimental group.

3.3. Procedure.

The study was implemented on the Third Grading and it lasted for eight weeks. Before it was started, a simple random sampling was conducted in order to determine the control and the experimental groups.

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On the first meeting, the experimental group was asked to take the pretest about the fundamental operations on fractions. Right after the pretest, papers were checked. In the experimental group, the class started with a practice test about the four basic operations on fractions and one problem solving involving fractions. This was a five-item test and was administered for 8 minutes and 2 minutes for checking. The students answered with the given span of time only for them to set their focus right away with the test and eventually develop speed and accuracy in solving. In the checking part, the teacher gave and showed the solutions on how to arrive with the answer. No discussions were made, students evaluated their answers and identified their errors. After checking the practice test, the teacher used the color signals to assess students' level of understanding about the operations on fractions. The students raised the green card if they were confident that they mastered the skill and the multi-step in operating fractions, and students raised the red card if they were not yet confident with their level of understanding about fractions. In this manner, the students and the teacher as well could evaluate their level of self-assurance towards fractions. After the daily practice test, regular class followed.

Similarly, with the experimental group, a pretest was administered to the control group, then a conventional 10 minutes review was conducted about the concepts of the fundamental operations on fractions. The teacher presented the same given in the experimental group and discussed it traditionally. The control group had two tests before the posttest. It was done after every fourth week. The same concept in the experimental group was discussed, the operations and problem solving. The teacher asked students through oral recitation or board work. But it didn't need to be given daily. Equally with the experimental group, the teacher used the color signals to assess students' level of understanding about the operations on fractions. The students raised the green card if they understood, and the red card if they needed more clarification. It was then followed, by the regular discussion for that day.

4. Results.

4.1 Performance Level of the Grade 7 Students in Mathematics.

Table 1 shows the pretest performance of the Grade 7 students in Mathematics

Groups	n	H.M.[a]	A.M.	Difference between means	Standard Deviation	Test Statistics		Qualitative Description
						Computed z	Tabled Value at $\alpha = 0.05$	
Control (subjected to conventional lecture)	75	9.60	5.00	4.60	3.43	11.61*	1.96	Below Average
Experimental (subjected to daily practice test)	75	9.60	4.97	4.63	3.57	11.23*	1.96	Below Average

[a]H.M. = 60% of the test items *significant

Table 1. The Pretest Performance of the Grade 7 Students in Mathematics.

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From Table 1, it can be seen that the control and experimental groups obtained actual means of 5.00 (SD = 3.43) and 4.97 (SD = 3.57) respectively. The computed z tests of 11.61 and 11.23 are greater than the tabled value of 1.96, hence, significant. In both cases H_{o1}, were rejected which means that both groups had means which were lower than the hypothetical mean, thus their pretest performance in Mathematics were Below Average. The control and experimental groups did not reach the standard criterion set by Department of Education. This below performance of the two groups might imply that they might have little or no knowledge of the concepts since this was still a pretest.

In Table 2, the control group had a mean of 7.65 with a SD of 3.80 and the actual mean of the experimental group was 11.81 and SD of 3.34. The computed z tests were 4.44 and 5.73 for the control and the experimental groups respectively. Thus, the computed z scores are greater than the tabled value of 1.96, henceforth, significant, so, in both cases H_{o1} were rejected. This means that the actual mean is significantly different from the hypothetical mean. But the mean score of the control group was lower than the hypothetical mean, thus their posttest performance in Mathematics was still Below Average. On the other hand, the mean score of the experimental group was higher than the hypothetical mean and so their posttest performance in Mathematics was Above Average. The outstanding performance of the experimental group might have resulted from frequent individual practice.

Groups	n	H.M.[a]	A.M.	Difference between means	Standard Deviation	Test Statistics		Qualitative Description
						Computed z	Tabled Value at $\alpha = 0.05$	
Control Group	75	9.60	7.65	1.95	3.80	4.44*	1.96	Below Average
Experimental Group	75	9.60	11.81	2.21	3.34	5.73*	1.96	Above Average

*[a]H.M. = 60% of the test items *significant*

Table 2. The Posttest Performance of the Grade 7 Students in Mathematics.

4.2. Mean Improvement of the Grade 7 Students in Mathematics.

Table 3 reveals the mean gains from the pretest to the posttest performance in Mathematics of the control and experimental groups.

Groups	n	Pretest Mean	Posttest Mean	Difference between means ($\bar{d}$)	Standard Deviation	Test Statistics	
						Computed t	Tabled Value at $\alpha = 0.05$ with n-1 df
Control Group	75	5.00	7.65	2.65	3.40	6.75*	1.995
Experimental Group	75	4.97	11.81	6.84	4.05	14.63*	1.995

*significant

Table 3. Mean Gain in Mathematics of the Grade 7 Students.

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Table 3 shows that the control group got a mean gain of 2.65 with a standard deviation of 3.40 while the experimental group had a mean gain of 6.84 with a standard deviation of 4.05. The computed t of 6.75 and 14.63 are greater than the tabled value of 1.995 at $\alpha = 0.05$ with 74 degrees of freedom. These are significant which means the rejection of Ho_2. This means that both groups which were subjected to conventional lecture and daily practice tests manifested significant improvement from the pretest to the posttest. The two methods used by the teacher were effective in teaching the fundamental operations on fractions to Grade 7 students. The effectiveness of the conventional lecture method might be due to the ease of the students' learning because in this method the teacher did the instruction while the students listened. The teacher gave the students chance to engage in oral and board work participation which could have enhanced learning. Conversely, the effectiveness of the daily practice test of the experimental group might be attributed to the fact that the students' subjected to repetitive tests could led to mastery of the concepts and therefore enhanced learning.

4.3. Comparison Between the Control and the Experimental Groups in Terms of Their Mean Gains.

Table 4 compares the mean gains of the experimental and the control groups.

Groups	n	Mean Gain	Standard Deviation	Difference between means	Test Statistics	
					Computed t	Tabled Value at $\alpha = 0.05$ with n-2 df
Control Group	75	2.65	3.40	4.19	6.86*	1.96
Experimental Group	75	6.84	4.05			

*significant

Table 4. Mean Gain Difference between the Control and the Experimental Groups.

As revealed in Table 4, a difference of 4.19 is obtained in favor of the experimental group. The computed t of 6.86 is greater than the tabled value of 1.96 at 5% level of significance with 148 degrees of freedom. This was significant and so, Ho_3 was rejected. This means that there was a significant difference in mean gains between the two groups. The experimental group which was subjected to daily practice test achieved better in solving fundamental operations on fractions than the control group. The result implies that students exposed in daily practice test had shown better improvement in their performance in solving the fundamental operations on fractions compared to students that were given direct instruction.

The result contradicted the six studies in the meta-analysis type of study conducted by Drowns, which found negative effect on frequent testing and showed that no significance was observed in using frequent testing to improve learning (Drowns, 1986). However, the result supported the researches of Kwan and Zgraggen stating that daily test is a better tool for assessing students' learning and its effectiveness in developing retention and mastery (Kwan, 2011; Zgraggen, 2009).It also supported the studies of Waite, Wolf, and Yigit about practice and the good impact on the scores and its positive effect on learning. (Wolf, 2007; Yigit, Kiyici, & Cetinkaya, 2014)

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5. Discussion.

The main purpose of this study was to find the effectiveness of the daily practice test in developing mastery of the Grade 7 students in solving the fundamental operations on fraction. This was an experimental method of research that utilized the pretest–posttest control group design. Four heterogeneous classes composed the subjects of the study. These classes were grouped into two, experimental and control groups consisting of 75 students randomly assigned to each group.

Pretest Performance Level.

Both the students of the control and experimental group showed Below Average performance in the pretest in Mathematics. The computed z tests of the two groups were greater than the tabled value, which means that both groups had means which were lower than the hypothetical mean. Thus, their pretest performance is low in comparison to the school's passing percentage set at 60% of the total score of an exam. The control and experimental groups did not reach the standard criterion set by Department of Education. This below performance of the two groups might imply that they might have little or no knowledge of the concepts since this was still a pretest. This shows that students were not able to master the concept of fraction as expected for high school students. This was supported with the study of Mohamed, Teoh, Singh, & Kor (2019), which show that the low performance in fraction implies not possessing the basic concepts nor the processes required in the learning of fractions during primary years. Respondents difficulties with fractions originate from conflicts with natural numbers, poor performance on problems associated with fraction, and never reaching proficiency in solving multi-step solutions in fractions (Bentley & Bosse', 2018)

Posttest Performance Level.

The students in the control group performed Below Average in the posttest while the students in the experimental group performed Above Average in the posttest. The actual mean of the control group did not reach the expected level because students might lack full understanding in the multiple-step in arriving the answers (Alghazo & Alghazo, 2017), and they lacked focus while having the direct teaching in the classroom. This also implies that students in the control group might lack understanding of fractions (Bentley & Bosse', 2018). Thus, the performance of the control group in the posttest was below the criterion set by Department of Education. On the other hand, there is a significant improvement in the experimental group, which was under daily testing. This result is supported by Kwan, Lang, Schugel, Bayat, Jamshidipour, Hashemi, Adkins, and Linville, which states that practice produces deeper and more effective learning if interspersed with extrinsic motivation(grades), and constructive feedback. (Kwan, 2018; Lang, 2016; Schugel, 2016; Bayat, Jamshidipour, & Hashemi, 2017; Adkins & Linville, 2017) The outstanding performance of the experimental group might have resulted from frequent individual practice and repeat actions previously associated with positive results by getting good grades as tested often (Willis, 2017).

Mean Gain of the two groups.

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There was a significant improvement from the pretest to the posttest performance for both control and experimental groups. Both groups manifested significant improvement in solving fundamental operations on fractions. The findings in the control group show that direct instruction increased their performance from the pretest to the posttest. This supported the result of the study conducted by Magliaro, et al, which found out that Direct Instruction improved students' performance (Magliaro, Lockee, & Burton, 2005). On the other hand, the results in the experimental group tell that daily practice test was effective in improving students' performance in Mathematics. This supported the findings of the study by Yigit, Waite, Kwan, and Zgraggen wherein they pointed out that frequent testing proved to be a helpful tool in improving student performance in Mathematics (Yigit, Kiyici, & Cetinkaya, 2014; Waite, 2007; Kwan, 2011; Zgraggen, 2009).

Comparison Between the Control and the Experimental Groups.

There was a significant difference between the mean gain scores between the two groups in favor of the experimental group. Daily Practice Test helped in the improvement of students' mastery in solving fundamental operations on fractions (Kwan, 2018; (Adkins & Linville, 2017; Bayat, Jamshidipour, & Hashemi, 2017). This study contradicted the study of Mines (2014), who found no significant difference with the conventional approach and daily practice testing. The higher performance exhibited to the experimental group exposed to daily practice test affirmed the Spacing Effect by Dempster and Farris, which states that students who are tested regularly are forced to develop study habits and do improve the practice time in mastering a concept (Adkins & Linville, 2017). The result also affirmed Skinner's Operant Conditioning, where students performed well with positive reinforcement (Ghorbani, 2017; Lang, 2016). In this study, students gave positive responses as they got high scores in each test, and if they did not, they learned from their mistakes and corrected it in the next test (Schugel, 2016; Ghorbani, 2017). Indeed, practice makes perfect. Daily testing helped solidify the students' understanding of the concepts by recalling and applying what they have learned for several weeks (Kwan F. B., 2018). This made students be involved in the learning process and eventually learned from their own experiences, thus affirming Dewey's theory.

6. Conclusion.

The purpose of this research was to use a daily practice test as a teaching strategy and assessment tool in mastering the operations on fractions and improve students' performance in Mathematics. It supports teachers in developing students' retention in a specific area and helps them improve those skills. As stated in the study, fractions are considered as one of the foundations in algebra and other branches of mathematics. Still, students' level of understanding about fractions is not enough to connect with the abstract concepts in algebra. This paper presents a strategy to address this concern, which is daily testing to maximize learning without sacrificing the curriculum.

In implementing a daily practice test, students take the key elements to produce the desired results. These fundamental elements or components are learning competencies, actualization, and self-assessment. Learning competencies in knowing the objectives and understanding the purpose of daily testing. This is evident in the study as students were taught

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the importance of mastering the concepts of fractions in application to the real world. Second is actualization. It is when students often take the test that supports Dewey's Learning by doing until they are confident with the problem and manifest mastery of the topic. It provides the students with a necessary condition of concept formation, which is the first step of Mathematics comprehension. The last part is self-assessment, as it allows students to evaluate their performance, give feedback, and correct their own mistakes. These elements have the most value when incorporated and supported by the teaching and learning process, which is the actual goal of using daily practice tests in class.

Testing is a powerful means of improving learning and functions to retrieve learned information through mental processes that work on memory. Frequent testing helps students in the mastery of a concept and maximize learning potential, thus, improve academic performance. Research in neuroscience is helping us understand how and why this is so. Based on the findings, a daily practice test was an effective vehicle that provides students with the opportunity to become proficient in solving the fundamental operations on fractions. This approach offers learners to use their cognitive skills to evaluate their solution, summarize the concepts, and create new learning by correcting their mistakes in the succeeding exams. In this process, students are encouraged to observe and discover patterns in dealing with the fundamental operations on fractions. The results of the study suggest that daily testing has a positive impact on students' mastery and have shown improvement in their study habits as tested often. The study affirmed the theories of Dempster and Farris, Dewey, and Skinner, which emphasize engaging students in frequent activities that will enhance learning and evaluate one's performance.

Based on the results and conclusions, the following actions are recommended: that since daily practice test had influence in improving mastery in solving mathematical calculations, teachers should include this intervention in their classes; that teachers use daily practice test as an alternative approach of remediating learning gaps on topics where students find it difficult or got low performance; that related studies in terms of longer time frame be also conducted; and that further studies be conducted which would compare Daily Practice Test with other types of assessment in learning.

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