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# Effectiveness of Ability Grouping Technique in the Performance and Engagement of Grades 2 Pupils in Math: Basis for Instructional Supervision

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## ABSTRACT

The classroom environment is the perfect context for social comparisons to occur as it provides an abundance of comparative information, as pupils work together and share ideas, allowing observation of information about peers including assignments, classwork, grades, discussions as well as teacher feedback. In this context, ability grouping technique is implemented in the classroom as it is believed to be effective in attaining improvement in performance among the pupils in Math. hence, this study is formulated to evaluate the effectiveness of ability grouping technique in teaching Math. employing quasi-experimental researcher design, the researcher-made tests was administered to determine the performance of the Grade 2 pupils in Math before and after the intervention. Simple percentage, and t-test of mean difference were the statistical tools used. Based on the result of the study, it was found out that there is a significant difference in the performances of Grade 2 pupils before and after the implementation of ability grouping technique in teaching Math. Grouping the pupils into smaller groups allows the teacher to tailor instructions based on the needs of each group, providing more targeted and differentiated learning experiences. With the proper implementation of the intervention coupled with differentiated instruction, activities and learning materials, the performance of the pupils in Math increased. Thus, ability grouping technique is an effective learning technique and method in improving the performance of the pupils in Math.

**Keywords —** *Effectiveness, Differentiated Mathematical Instruction, Performance, Grades 3 & 4 Pupils, Instructional Supervision*

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## I. INTRODUCTION

To promote pupils' learning, especially in Math, the pupil must be motivated and engaged in the class. To do that, the teachers need to challenge the pupils appropriately with the proper content. Pupils must work at their instructional level-not too hard, but not too easy. To increase pupils' engagement, each pupil should have defined, clear, and rigorous learning expectations, so that every pupil experience challenges and success. Usually, Math teachers bring one or two tasks to class each day, which would be an appropriate difficulty level for the pupils and help them learn the overall material properly. These tasks should motivate and engage pupils to nurture and support their curiosity in class.

When pupils are learning math, they need to remember numerical facts, and then apply the numerical facts to solve more complex problems (Tomasetto, 2021). Ay Emanet and Kezer (2021) stated, "The learner should proceed by the following instructions of his teacher, who is a guide in the learning process, with his active participation, not without

making sense of the knowledge or by memorizing, but by building up new knowledge by using prior knowledge". It is beneficial to make sure that teacher teaches the pupils the math knowledge and skills required to be successful with daily life math (Folk, 2021).

Math anxiety is an increasing problem for pupils; it is based on their low ability to complete math tasks. Math anxiety was thought to only affect middle and high school-aged students, but it is being found that younger pupils are having anxiety about math (Maloney & Beilock, 2012). Parents' anxiety about math at times causes math anxiety in pupils (Szczygiel, 2020). Szczygiel (2020) found that there was more of a correlation with the students' fathers' anxiety affecting pupils' own anxiety about math, than the mother's anxiety about math affecting pupils. Math interventions can help relieve some of the math anxiety students are experiencing, in all, making them more comfortable with the math materials being taught. Some students may have anxiety about testing, which will cause them to achieve a lower test score. Helping the students become confident in their math skills will help alleviate some of the anxiety associated with math and testing.

One way of relieving pupils from anxiety is through small group instruction. When pupils are grouped based on their ability and capability to accomplish the task, more activities will be done, and improved performance will be achieved. Teachers believe that pupils at different ability levels need different types of instruction, therefore, ability grouping technique is possible in making the pupils learn the concepts in Math and at the same they will be motivated to be involve in the activity.

Ability grouping technique is a strategy used by teachers in the delivery of the lessons in Math. Pupils are grouped together based on the intellectual capacity and capability in accomplishing the task. Children of similar attainment levels are grouped together and tend to be allocated to specific tables so they sit/work together in their group. Within-class ability grouping means that all children within the class are taught by the same class teacher and tend to follow the same curriculum. Children in the different groups are given different levels of challenge, expectations, and support. The teacher may use different ability groupings for different topics, tasks, activities as well choose to utilize mixed-ability groupings where children are selected from different ability levels to form groups.

It was observed during the first two months of the opening of classes that there are some pupils who cannot cope easily with the lesson, making them unable to master the skills. As observed by the teacher, pupils who are engaged in Math activities are only those who can easily grasp the ideas conveyed in the lesson. Based on this scenario since performance of some of the pupils were affected, the researcher had come up with an intervention of creating small group of pupils based on their abilities and capabilities to do the tasks given them. Small group instruction was implemented, making every pupil part of the activities.

Small group instruction combined with extra time for struggling students is an effective way to increase student achievement (Battelle for Kids, 2013). These effects are even greater when combined with differentiated instruction and materials in groups of 3-4 students. Collins and Gan (2013) argue the merits of ability grouping claiming that teachers are better able to tailor instruction to the specific academic needs of the students in their homogeneously grouped class. Collins and Gan (2013) developed a unique formula that used students' previous achievement score and correlated it with their current class and it's grouping practice. In their, they found that homogenous ability groups benefitted all students, including special education and gifted students (Collins and Gan, 2013).

Thus, it is in this premise that the researcher decided to conduct this study to evaluate the effectiveness of ability grouping technique in the performance and engagement of grade 2 pupils in Math. A proposed instructional supervision plan was formulated based on the findings of the study.

It is in the rationale that the researcher who is currently a grade 2 teacher in the above mentioned local, would like to delve worthy research undertaking that will benefit herself, the school she is currently teaching and that of her Graduate Program she is enrolled at.

This study evaluates the effectiveness of ability grouping technique in the performance and engagement of grade 2 pupils in Math of Cagbuhangin Elementary School, Ormoc District 6, Ormoc City Division for School Year 2023-2024. The findings of the study were the basis for the proposed instructional supervision plan.

Specifically, this study sought to answer the following questions:

1. What is the performance and level of engagement of the Grade 2 pupils in Math before the implementation of ability grouping technique?
2. What is the performance and level of engagement of the Grade 2 pupils in Math after the implementation of ability grouping technique?
3. Is there a significant difference in the performance and level of engagement of the Grade 2 pupils in Math before and after the implementation of ability grouping technique?
4. What instructional supervision plan can be proposed based on the findings of this study?

## II. METHODOLOGY

**Design.** This study employed the quasi-experimental research design utilizing the pre-test and post-test to evaluate the effectiveness of ability grouping technique in the performance and engagement of grade 2 pupils in Math as basis for instructional supervision. Cagbuhangin Elementary School, Ormoc District 6, Ormoc City Division is the main locale of the study. The 21 Grade 2 pupils enrolled in the said locale for School Year 2023-2024 are the main respondents of the study. This study utilized the researcher-made Math test in Grade 2. The competencies in the 2<sup>nd</sup> quarter Most Essential Learning Competencies (MELCs) will be the basis in the formulation of the test. The researcher formulated a 30-item test multiple choice questions. The test was conducted before and after the implementation of ability grouping technique in teaching Math. Moreover, the researcher prepared lesson plans for teaching Math based on the competencies for the second quarter implementing ability grouping technique and prepared differentiated learning materials and activities based on the ability groupings implemented as part of the intervention for this study. The pupils were grouped based on the result of the pre-test and each group was given differentiated materials and activities. The researcher formulated differentiated activities and other learning materials which are suited to the ability groupings implemented by the teacher during teaching-learning process. The materials crafted were submitted to the District Coordinator and Quality Assurance Team for evaluation, validation, and adjustments before it was utilized by the learners in the classroom. A Matrix of Activities was formulated to track the progress of the intervention. This research focused on evaluating the effectiveness of ability grouping technique in the performance and engagement of grade 2 pupils through the pre-test and post-test and its significant difference. A Proposed Instructional Supervision Plan based on the findings of the study is the output.

**Sampling.** There are 21 Grade 2 pupils involved in this study. They are the pupils enrolled in the grade for School Year 2023-2024 in the said locale. Complete enumerations were used to identify the respondents of the study. A researcher-made test was used as a tool and the implementation of the intervention was administered personally to each of the pupils during the assessment period following the prescribed health protocol.

**Research Procedure.** The researcher prepared the research design and tools utilized in the study. Approval and recommendation from the Panel of Examiner of the Graduate Studies was sought. A letter request to conduct this study was forwarded to the Office of the Schools Division Superintendent. Upon approval, permission from the District Supervisor and School Head was secured before the actual gathering of data. Orientation of the participants and administration of the pre-test was done during the assessment period for the class after the approval of the permit from the parents of the respondents. Data privacy was emphasized also in the meeting. After accomplishing the pre-test, intervention was given within four weeks. The pupils were grouped based on the result of the pre-test and each group was given differentiated materials and activities. During Math lessons, the pupils immediately proceed to their respective groups and do the activities provided to them by the teacher. Discussion of the concepts was for each group of learners and after, a series of activities was provided to master the skills for the day. The researchers formulated differentiated activities and materials for utilization during the teaching-learning process and this formed part of the intervention for the study. After the intervention, a post-test was provided. Data were tallied and submitted for statistical treatment. Analysis and Interpretation of Data. Making of Proposed Instructional Supervision Plan followed.

**Ethical Issues.** The researcher properly secured the permission to conduct the study from the authorities through written communication. In the formulation of the intervention materials that was used in the study, the use of offensive, discriminatory, or other unacceptable language was avoided. The respondents' names and other personal data were not included in this study to protect their privacy. Participation of the respondents was also voluntary. Orientation was conducted for the respondents with their parents. In the orientation, issues and concerns were addressed and consent to be included in the study were signed. The researcher-maintained objectivity in analyzing and discussing the results. All authors whose works were mentioned in this study were properly quoted and were acknowledged in the reference.

**Treatment of Data.** Simple Percentage was employed to evaluate the performances of the grade 2 pupils in Math before and after the implementation of ability grouping technique. **t-Test of Mean Difference** was used to determine the significant difference in the performances of the grade 2 pupils in Math before and after the implementation of ability grouping technique.

### III. RESULTS AND DISCUSSION

**TABLE 1**

**PERFORMANCE OF GRADE 2 PUPILS IN MATH BEFORE THE INTERVENTION**

Score Range	Description	PRETEST	
		Frequency	%
25-30	Excellent	0	0
19-24	Very Good	5	24
13-18	Good	9	43
7-12	Fair	5	24
1-6	Poor	2	9
Total		21	100
<b>Weighted Mean</b>		<b>14.33</b>	<b>Good</b>

Table 1 presents the performance of the Grade 2 pupils before the implementation of ability grouping techniques. It was revealed on the table that among the 21 Grade 2 pupils tested, 2 or 9% got a score of 1-6 which is poor. This means that these pupils performed poorly in their math activities. Moreover, it was also shown on the table that 5 or 24% of the 21 Grade 2 pupils got a score of 7-12 which is fair. This means that these pupils performed fairly in Math lessons. The fair performance reflects a level of understanding and skill development that is in line with the expectation for Grade 2 Math curriculum. Further, 9 or 43% got a score of 13-18 which is interpreted as good. Good performance in math generally indicates that students were achieving at a high level of achievement, demonstrating a deep understanding of mathematical concepts. Additionally, the table also shows that 5 or 24% got a score of 19-24 which is interpreted as very good. This means that there are pupils who already possess a deeper understanding of the mathematical concepts even though the intervention had not yet been implemented. Finally, the data shows that the performance of the Grade 2 pupils in Math before the implementation of ability grouping technique resulted to a weighted mean of 14.33 which is interpreted as good. This means that pupils achieve good performance in terms of assessment in Math. Unfortunately, the results do not match that of the standards that 75% of the pupils were able to achieve at least 75% of the items. Hence, this result implies support from the teacher to achieve the desired learning outcomes. The researcher who is at the same Math teacher of the pupils tested had observed that these pupils learn best if they are grouped into smaller numbers and their groupings are based on their ability to accomplish the task given. Thus, the researcher crafted intervention activities where pupils will be grouped based on their ability and capability to understand the lessons conveyed in Math. According to Dupriez (2010), teachers practice ability grouping because it enables them to tailor curriculum content to specific groups of learners according to their levels of performance. Learners come to the educational table with varying abilities, talents and needs, which teachers tap into using ability grouping (What Works 2006), positively impacting the improvement in educational standards of all learners (Senter, 2013). In Finland, teachers practice ability

grouping because they believe in the right for every child to receive the necessary educational support (Aziz, 2018). Small groups need to be small, but not too small. Smaller groups promote better interdependence with students; larger groups provide more diverse opinions and backgrounds (Enu et al., 2015). According to Enu et al. (2015), a small group is not just about the size but the teaching and learning context and how the teacher facilitates the learning process. Doing interventions in small groups rather than one-on-one offers a more time-efficient way to improve math skills for more students. Also, utilizing other support staff with interventions can be helpful to reach more student needs. (Fuchs et al., 2008; Gersten et al., 2009). Small group cooperative learning was found to improve math achievement with students. The size of the group was not as important, but instead how the learning was facilitated in the group (Enu et al., 2015). When students work in groups, they can experience personal growth and confidence (Caulfield & Persell, 2006).

**TABLE 2**  
**PERFORMANCE OF GRADE 2 PUPILS IN MATH AFTER THE INTERVENTION**

Score Range	Description	POST TEST	
		Frequency	%
25-30	Excellent	7	33
19-24	Very Good	8	38
13-18	Good	6	29
7-12	Fair	0	0
1-6	Poor	0	0
Total		21	100
<b>Weighted Mean</b>		<b>22.00</b>	<b>Very Good</b>

Table 2 provides data on the performance of the Grade 2 pupils after the implementation of ability grouping techniques in teaching Math. It was revealed on the table that among the 21 Grade 2 pupils tested, 6 or 29% got a score of 13-18 which is good, while 8 or 38% got a score of 19-24 which is very good and 7 or 33% got a score of 25-30 which is excellent. This means that after the implementation of ability grouping techniques in teaching Math, the performance of the pupils increases. Teaching the pupils in a small group can be beneficial and create a positive learning outcomes in the sense that pupils can be given attention and the activities provided is based on their ability to accomplish the task. Further, ability grouping as being beneficial because learners with special educational needs can be offered more time and practice to cope with the content and to learn skills that would have been taught to the entire class, whilst the other learners are busy with enrichment activities. Other teachers position the need for differentiated instruction as the main driving force behind learner grouping by ability. Teachers feel that grouping learners by ability enables them to vary work according to the levels of operation of the learners (Efthymiou & Kington, 2017). They can give learners who are struggling fewer challenging tasks in their own groups, as much of the curriculum and lesson planning is aimed at addressing their common needs in the groups. Spratt and Florian (2013) observed that learners with special educational needs in New

Zealand are assigned to their own groups as teachers are of the view that such an arrangement enables them to revisit the content and skills covered in a particular unit or lesson. ‘Gifted’ learners can be allowed to proceed at their own pace, working on more challenging work in their own groups without being held back by learners with special educational needs (Yee, 2013). Teachers find it easier to present content in an organized, direct, and efficient manner, taking into consideration learners’ abilities and interests and differentiating instruction according to individual strengths and needs.

**TABLE 3**

**TEST OF DIFFERENCE IN THE PERFORMANCE OF GRADE 2 PUPILS IN MATH BEFORE AND AFTER THE INTERVENTION**

Aspects	Test Scores		Computed T	Critical T	Decision	Interpretation
<b>Grade 6 Pupils in Math</b>	Pre	14.33	1.031	0.433	Reject H <sub>0</sub>	Significant
	Post	22.00				

Table 3 presents the test of difference in the performances of Grade 2 pupils before and after the implementation of ability grouping technique. It was revealed on the table that the performance of the Grade 2 pupils before the implementation of ability grouping technique in teaching Math has an average mean of 14.33 which increases to 22.00 after the implementation of the intervention. Based on the data, the computed t of 1.031 is greater than the critical value of t of 0.433, so null hypothesis is rejected. This means that there is a significant difference in the performances of Grade 2 pupils before and after the implementation of ability grouping technique in teaching Math. Grouping the pupils into smaller groups allows the teacher to tailor instructions based on the needs of each group, providing more targeted and differentiated learning experiences. With the proper implementation of the intervention, the performance of the pupils in Math increased. Aside from this, the activities provided which are differentiated and based the level of understanding of the pupils in a group and the enthusiasm to finish the task given while all members of the group actively involve and engage in the activity had made it into an improved learning outcome. This implies effectiveness on the intervention provided to the pupils. Similar findings have proven the effectiveness of the study. Like Matthews, Ritchotte, and McBee (2013) who examined the effects of grouping on non-gifted and gifted students between grades 2 to 6 years within a three-year period. The results showed an appreciable increase in reading for both gifted and typical students within the period. Students also work in groups with peers of like ability, thereby increasing their self-esteem since they have been spared the embarrassment of competing against peers that are brighter than they are (Ansalone, 2003). And self-belief may serve as a tonic to spur such students on to improve their academic fortunes. Research has also proven that other positive effects of ability grouping include making pupils to work in classes at a rate that would suit them and other pupils of similar abilities, and this was applicable to pupils of all abilities (Muijs & Dunne, 2010). This affords high ability pupils the opportunity to work

together and harder to achieve and allow low ability pupils to experience success by lessening direct competition with more able individuals; thereby making it possible for members of either group to cope with the pace of learning.

#### IV. CONCLUSIONS

The classroom environment is the perfect context for social comparisons to occur as it provides an abundance of comparative information, as pupils work together and share ideas, allowing observation of information about peers including assignments, classwork, grades, discussions as well as teacher feedback. In this context, ability grouping technique is implemented in the classroom as it is believed to be effective in attaining improvement in performance among the pupils in Math. Based on the result of the study, it was found out that there is a significant difference in the performances of Grade 2 pupils before and after the implementation of ability grouping technique in teaching Math. Grouping the pupils into smaller groups allows the teacher to tailor instructions based on the needs of each group, providing more targeted and differentiated learning experiences. With the proper implementation of the intervention coupled with differentiated instruction, activities and learning materials, the performance of the pupils in Math increased. Thus, ability grouping technique is an effective learning technique and method in improving the performance of the pupils in Math.

#### V. RECOMMENDATIONS

1. Utilize the proposed instructional supervision plan formulated.
2. The school could enhance the teaching and learning process by providing professional development training, seminars, and workshops for teachers in applying different strategies and approaches in teaching Math.
3. School heads must encourage and support teachers to implement ability grouping techniques in teaching Math.
4. Teachers must focus on strategies that promote knowledge acquisition and content mastery to facilitate effective teaching and learning.
5. Teachers must design differentiated activities and learning materials to be used in teaching Math concepts.
6. Teachers can help students effectively understand the lesson's content through teaching the subject in small groups.
7. Teachers must consider the physical and psychological factors to create optimal learning conditions and address those issues at once to improve learning.
8. Teachers must create a versatile classroom layout with different seating arrangements incorporated to support individual and group work or small group activities.
9. Teachers must also use effective classroom discipline techniques that promote a positive and safe learning environment from a psychological standpoint, and
10. Future researchers should replicate this study to include different locales and include different variables aside from the mentioned in this study.



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## ACKNOWLEDGEMENT

I would like to begin by expressing my deepest gratitude to everyone who contributed to the completion of this thesis book. Your support, encouragement, and belief in me were instrumental throughout this entire journey. First and foremost, I want to acknowledge the divine guidance and blessings that have been bestowed upon me. I am incredibly grateful for the strength, inspiration, and wisdom that God has provided me, allowing me to overcome challenges and remain steadfast in my pursuit of knowledge. To Dr. Jasmine B. Misa, my thesis adviser, for the unwavering dedication, expertise, mentorship, and invaluable feedback that have been essential in shaping the direction and quality of this research. To the members of my Thesis Committee and Panel Examiners headed by Dr. Bryant C. Acar, Chairman and Scribe of the Pre and Oral Examination panel, together with Dr. Annabelle A. Wenceslao and Dr. Elvin H. Wenceslao for their valuable insights, constructive critiques, and commitment to the development of my research. To the Dean of the Graduate Department of Western Leyte College, Dr. Sabina B. Con-ui, for your understanding and consideration in all my requests. To my DepEd Ormoc City Division Family headed by Dr. Carmelino P. Bernadas, Superintendent; and District VI Supervisor, Dr. Elena Angelita C. Sios-e, for allowing me to conduct this study in our school. To my Cagbuhangin Elementary School, headed by our approachable and attentive School Principal, Mrs. Ma. Daisy C. Ibarra, the faculty and staff, parents, and pupils for having been instrumental in the realization of this endeavor. To the unwavering support of my husband, Abraham D. Licardo and kids, Athena Jean, and John Aimerson, who have been my pillar of strength throughout this entire process. Their love and belief in me have been my driving force. To my aunt's family in Camotes – Nanay Saling, Tatay Pepe, Japhet and wife Chin2, Aunt Maura in Bohol and my in-laws in Palompon, for their unconditional love, prayers and support extended which inspire me to achieve my educational goal. I am forever grateful and deeply indebted to each one of you who has believed in me and encouraged me along the way. Your confidence in my abilities has motivated me to consistently work hard and strive for excellence. To God be all the Glory.

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