# Math Groupings under Pull-Out System

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**Abstract:** *The main purpose of this study was to ascertain the factors related to learning Math 7 within the Pull-out System of Holy Spirit School of Tagbilaran City for school year 2013-2014. This study further aimed to determine the profile of the students in terms their attitudes towards Math subject and the perception about the pull-out system according to the four groups such as superior, above average, average and below average. The student's math grade in 2013-2014 under pull-out system was also determined. Another, it sought to determine whether there is difference on the responses of the students in their attitudes towards math and pull-out system among the four groups. The Math performance of the students under pull-out system was also analyzed by comparing among the four groups. Furthermore, it aimed to determine whether the student's attitude in math and the perception in pull-out system is associated with their groupings. The descriptive method was used in this study. There were three (2) different questionnaires distributed to the respondent namely; the attitude of the students towards math and perception towards pull-out system. The respondents of the study were the 176 grade seven students in Holy Spirit School of Tagbilaran for School year 2013-2014. The gathered data were treated using percentage and weighted mean, Chi-square for Independence to get the relationships between two variables and One-way ANOVA for the difference of Math grades among the four groups. Based on the findings, the researcher concluded the perceptions towards math and pull out were rated agree by the students. There was significant difference on the perceptions of the students towards math and pull-out among the four groups. Besides, the math performance of the pupils differ significantly from each other except the group of Average and Below Average group which have same math performance. The groupings in pull-out system were related to students' attitudes in math, perception in pull-out and to their math performance. Therefore, it was recommended that the Pull-out system may be improved by identifying problems and difficulties encountered by teachers, schools, students and parents to address necessary issues that arise. Less number of students in the last group may be considered for teacher to follow-up students individually. The grouping should be systematically and objectively created since it was related to how students behave in math, how they perceived pull-out and their math performance under the system.*

**Keywords:** Math Grouping, Pull-out System, Attitude in Math, Perception in Pull-out, Math Learning

## 1. Introduction

According to National Competiveness Council (NCC), Philippines is ranked 112th out of 138 countries under study for the year 2010-2011 (de Leon, 2011). The recent National Mathematics Advisory Panel Report released in 2008 summarized the poor showing of students in the United States on international comparisons of mathematics performance such as the Trends in International Mathematics and Science Study (TIMSS) and the Program for International Student Assessment (PISA). However, these students who experienced difficulty in mathematics need some ways and means to consider addressing the issue. To address this issue, the school implemented the "Pull-Out System. " From over many years of heterogeneous grouping, the new system implemented hoped to answer the need of the students in their quest in Math.

This study is anchored on what Denise Soares and Kimberly J. Vannest (2013) cited in their journals on Cognitive-behavioral therapy, Pioneered by psychologists Aaron Beck and Albert Ellis in the 1960s, that cognitive therapy assumes that maladaptive behaviours and disturbed mood or emotions are the result of inappropriate or irrational thinking patterns, called automatic thoughts. Instead of reacting to the reality of a situation, an individual reacts to his or her own distorted viewpoint of the situation.

A study from Lou, et al. (1996) as cited by Adodo S. O. and Agbayewa J. O. (2011) of Nigeria in their research on the homogeneous and heterogeneous class verifies the concept of the ability grouping that it had a differential effect on students learning. Low achieving students feel more comfortable and participate more when they are grouped with peers of similar or same ability. The high achievers have their interest and incentive maintained in a homogeneous group. This negates the argument of Emily (2003) that neither homogeneous nor heterogeneous ability grouping is superior for promoting academic achievement of students.

James Kulik (1992) points out that grouping program, which entails substantial adjustment of curriculum to students' ability, have clear positive effects on children. The groupings into XYZ programs do not have devastating effects on student self-esteem but effects may be slightly positive for lower ability students and slightly negative for higher aptitude ones. One study 6 found that students who were tracked in math had increased ego orientation, which led to students labelled high achieving being less willing to seek help, while not increasing the willingness of low achievers to seek help (Butler, 2008).

A study also found that students who were tracked in math had increased ego orientation, which led to students labelled high achieving being less willing to seek help, while not increasing the willingness of low achievers to seek help (Butler, 2008). The ability grouping was commonly practiced during early twentieth century (Barquet, 1992). However, there were issues and concerns regarding the effectiveness and fairness of the system in 1980's (Gamoran, 2009).

## 2. Objectives

The main trust of this study was to determine the performance of Math 7 and other factors within the Pull-out System of Holy Spirit School of Tagbilaran City for school year 2013-2014. Specifically, it sought to answer the following:
1) What is the profile of the students in four groups terms of the following:
   a) Attitudes towards math
   b) Perception towards Pull-out system
   c) Mathematics performance of students in school year 2013-2014 under pull-out system
2) Is there significant difference on the responses of the students in four groups in terms of:
   a) Attitudes towards math
   b) Perception towards pull-out system
   c) Mathematics performance of students in school year 2013-2014 under pull-out system
3) Is there significant relationship between the groupings of students in pull-out system and:
   a) Attitudes towards math
   b) Perception towards pull-out system
   c) Mathematics performance of students in school year 2013-2014 under pull-out system

## 3. Methodology

**Design:** The study employed the descriptive method of research. It is to ascertain the factors that relate learning in math of the Grade 7 students under pull-out system in Holy Spirit School of Tagbilaran for school year 2013-2014. The study utilized the quantitative techniques of data generation.

**Environment and Participants:** The study was conducted in Holy Spirit School-Tagbilaran, with teachers under pull-out in Math 7 and the Grade 7 students in Holy Spirit School, Tagbilaran City for school year 2013-2014. The whole population of the grade 7 students under pull-out system in Mathematics were chosen using purposive sampling since the researcher is also handling the grade 7 math.

**Data Gathering:** After all requests were granted, the researcher distributed the sets of questionnaires to the respondents who are students in grade 7 in Holy Spirit School of Tagbilaran. The study followed two phases such as Preparation and Validation of the Instruments for students' attitude and perception towards pull-out system which were constructed and pilot tested while students' math performance was gathered from the school registrar.

## 4. Results and Discussion

1) Students' attitude towards math subject is Positive with a composite mean response of 3.32. Specifically, the three groups except the superior group have attitudes towards math are positive to Mathematics subject. Only the superior group shows very positive attitude in math subject. On the other hand, the students are very positive about the pull-out system conducted by the school as indicated in the weighted mean response of 3.69. It can also be noticed that among the four groups, the superior group has highest weighted mean of 4.17 which is still very positive about the pull-out system.

**Table 1:** Students' Attitude in Math and Perception in Pull-out System, N=176

| Groups | Attitudes in Math | | Perception in Pull-out System | |
|---|---|---|---|---|
| | Weighted Mean | Descriptive Value | Weighted Mean | Descriptive Value |
| Superior (A) | 3.86 | Very Positive | 4.17 | Very Positive |
| Above average (B) | 3.31 | Positive | 3.65 | Very Positive |
| Average (A) | 2.96 | Positive | 3.48 | Very Positive |
| Below Average (B) | 3.12 | Positive | 3.40 | Very Positive |
| Overall | 3.32 | Positive | 3.69 | Very Positive |

2) The grades of the students for three quarters by group were as follow: The Superior (A) got average of 89.26 which is Proficient level, above average group had mean grade of 83.85 which is Approaching Proficiency level while Average and below average group have means of 79.39 and 79.83 respectively which is both developing level. This showed that students in the last group approach the level of the average group. It can be deduced that the student's math performance is decreasing across quarters considering the difficulty of the lessons taught in each quarter. Also, it is noticeable that Below Average Group (D) has slightly higher average (79.83) compared to the Average group (C) average (79.39) which is not the expected result since the groupings of the students depend on how good they perform in math subject.

**Table 2:** Students' Math Performance, N=176

| Groups | First Quarter | Second Quarter | Third Quarter | Means |
|---|---|---|---|---|
| Superior (A) | 90.7 | 89.04 | 88.04 | 89.26 |
| Above Average (B) | 83.36 | 84.41 | 83.77 | 83.85 |
| Average (C) | 81.86 | 78.61 | 77.7 | 79.39 |
| Below Average (D) | 79.33 | 80.76 | 79.38 | 79.83 |
| Means | 83.81 | 83.21 | 82.22 | |

3) By One-Way ANOVA, the computed F value of 27.359 is higher than the tabular value of 2.68 at 0.05 alpha levels which rejects the null hypothesis. There was enough evidence that at least one of the four group have significant different responses from the other groups for both math and pull-out system. The Superior group (A) is significantly more positive attitude in Math subject than Above average (B), Average (C) and Below Average (D) groups. However, the students have same positive attitude in Math in the three groups (B, C and D).

**Table 3:** Difference on the Attitude of the Students towards Math among the Four Groups, N=176

| Pairs | Composite Means | Computed Value (Fs) | Tabular value α=0.05 | Decision | Interpretation |
|---|---|---|---|---|---|
| | | Scheffé Test | | | |
| A and B | 3.86 and 3.31 | 22.72 | 8.04 | Significant, Ho: Rejected | A>B |
| A and C | 3.86 and 2.96 | 58.73 | 8.04 | Significant, Ho: Rejected | A>C |
| A and D | 3.86 and 3.12 | 39 | 8.04 | Significant, Ho: Rejected | A>D |
| B and C | 3.31 and 2.96 | 9 | 8.04 | Insignificant, Ho: Accepted | B=C |
| B and D | 3.31 and 3.12 | 2.39 | 8.04 | Insignificant, Ho: Accepted | B=D |
| C and D | 2.96 and 3.12 | 1.87 | 8.04 | Insignificant, Ho: Accepted | C=D |

4) The perception of the students in pull-out system F=19.192 was also higher than the tabular value of 2.68, it means that at least one group is significantly different among the four group. When these group were identified by further testing, in table 4, group A differs from group B, C and D. It implies that Group A's response was far different from the three other groups' response and the three remaining groups have likely same responses about pull-out system. The variations of responses among the four groups were due to the groupings. By looking at the weighted means, the Group A has the highest rating while the next follows the groups based on the pull-out grouping.

**Table 4:** Difference on the Attitude of the Students towards Pull-Out System among the Four Groups, N=176

| Pairs | Composite Means | Computed Value (Fs) | Tabular value α=0.05 | Decision | Interpretation |
|---|---|---|---|---|---|
| | | SchefféTest | | | |
| A and B | 4.17 and 3.65 | 21.83 | 8.04 | Significant, Ho: Rejected | A>B |
| A and C | 4.17 and 3.48 | 46.38 | 8.04 | Significant, Ho: Rejected | A>C |
| A and D | 4.17 and 3.40 | 36.19 | 8.04 | Significant, Ho: Rejected | A>D |
| B and C | 3.65 and 3.48 | 4.79 | 8.04 | Insignificant, Ho: Accepted | B=C |
| B and D | 3.65 and 3.40 | 2.1 | 8.04 | Insignificant, Ho: Accepted | B=D |
| C and D | 3.48 and 3.40 | 0.51 | 8.04 | Insignificant, Ho: Accepted | C=D |

5) There was significant difference on the academic performance of the students among the four groups. Among the four groups, only the below average group (C) have same academic performance with the last group (D). All the rest differ significantly from each other based on the groupings according to the ability of the student in the performance in mathematics subject

**Table 5:** Difference on Math performance in Four Groups

| Pairs | Grades | Computed Value (Fs) | Tabular value α=0.05 | Decision | Interpretation |
|---|---|---|---|---|---|
| | | Scheffee Test | | | |
| A and B | 89.26 and 83.80 | 59.77 | 7.97 | Significant, Ho: Rejected | A>B |
| A and C | 89.26 and 79.39 | 192.94 | 7.97 | Significant, Ho: Rejected | A>C |
| A and D | 89.26 and 79.83 | 37.94 | 7.97 | Significant, Ho: Rejected | A>D |
| B and C | 83.80 and 79.39 | 30.14 | 7.97 | Significant, Ho: Rejected | B>C |
| B and D | 83.80 and 79.83 | 171.97 | 7.97 | Significant, Ho: Rejected | B>D |
| C and D | 79.39 and 79.83 | 0.35 | 7.97 | Insignificant, Ho: Accepted | C=D |

6) The Math groupings have moderate relationship to students' attitudes in math, perception in pull-out system and academic performance in Math.

**Table 6:** Relationship between Math groupings and Attitudes in math, Perception in Pull-out system and Academic Performance

| Variables | Chi-square ($x^2$) | Contingency coefficient | Critical Value | Decision |
|---|---|---|---|---|
| Students' attitudes in math | 52.68 | 0.469 | 21.026 | Significant Moderate relationship Ho: Rejected |
| Students' perception in Pull-out | 44.15 | 0.437 | 21.026 | Significant Moderate relationship Ho: Rejected |
| Students' academic performance | 108.35 | 0.606 | 21.026 | Significant Moderate relationship Ho: Rejected |

This means that the groupings of the students during math subject affected on how they perceived math subjects and the pull-out system. Importantly, the groupings have moderate relationship to their math performance. This further means that the groupings of the students have contributed to students' status in mathematics subject.

## 5. Conclusions

In terms of their attitudes towards math subject, the attitude of superior group differs significantly from above average, average and below average group while the above averages' attitude in Math is far different from the below average group. On the perception in Pull-out system, response of superior group differs significantly from above average, average and below average group. Further, attitudes towards

Math and perception in pull-out system have been perceived differently by the superior group from other groups. On the other hand, the grouping of the pull-out system is a factor on how students look at math subject, how they defined pull-out system and how they performed in mathematics. Therefore, it can be concluded that the Pull-out system affects the student's attitude in math and the way they learn in the subject.

## 6. Recommendations

Based on the drawn conclusions of the study, the researcher came up with the following recommendations:

1) The grouping of the students should be done with thorough and careful process so that students will be placed on the right group since grouping affects their math performance. bases for grouping should be defined and identified strictly with thorough evaluation.

2) Students in lower group may be given importance as to how to improve their Math performance. Little number of students in this group will be considered to follow-up students individually.

3) Standard procedures, that are uniform and objective may be adopted by all teachers handling pull-out in order to make students feel they are not different from the other group. This include uniform assessment tool, learning contents and varied strategies that fit their learning styles.

4) Pull-out system may be improved since it influences the math performance of the students. Problems and difficulties encountered by the teachers and the school should be identified to create a well-organized system in Pull-out.

5) The procedures and contents of the method may serve as a guide in conducting related studies. It is further recommended to improve the provided procedures and methods in conducting the study. If possible, study that will determine effectiveness of the pull-out system and the effectiveness of its implementation will be considered

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