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# Team-based remedial instruction for Science 8 Learners At Risk of Dropping Out (LARDO)

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ABSTRACT

This study measured the effect of Team-based Remedial Instruction for Science 8 learners at risks of dropping out of Ronda National High School, Ronda, Cebu for the School Year 2017-2018 as for basis for the implementation of the learning module. Specific problems include respondents' profile; and the respondents' level of academic performance before and after the implementation of Team-based Remedial instruction. It utilized quasi-experimental method using quantitative analysis. Student's profile show majority were 16 years old and male students, have combined monthly income of parents between 5,000 and below. Majority of the respondents belonged to a family composed 7 members and above with a majority of having 7 kilometers and above home distance from school. The results of students' level of academic performance in atomic structure have a description of Fairly satisfactory. The mean difference of between the pretest and posttest is determined using t-test with significance level alpha (α) of 0.05, using two-tailed test, with degrees of freedom at 46, gives critical value of 1.684 and the computed value is 22.92 which is greater than critical value. Decision is to reject H0. Similarly, there is significant difference in the attendance before and after the implementation of team-based remedial instruction. Students' level of performance in Atomic Structure and Periodic table of Elements got verbal description "Fairly Satisfactory" after using the Team- based Remedial instruction. As concluded in this study, test results showed significant difference in the application of Team-based Remedial instruction in teaching Chemistry, therefore it is effective and deemed implementable. It is therefore recommended that team-based remedial instruction implementation be initiated.

Keywords: Chemistry teaching; team-based remedial instruction; quasi-experimental research; Ronda, Cebu, Philippines

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## INTRODUCTION

Chemistry is considered as difficult subject for most of the students despite of being the most improved relevant science that shows aspect of human struggles and natural phenomena. This idea may be attributed by the abstract perceptions of chemistry which students think irrelevant to the world they live in (Magwilang, 2011). Hence, many curriculum developers and administrators strive to find for methods that may up heave the maximum absorption of Chemistry concepts and applications. However, many learners still got difficulty in grasping and retaining the main concepts undertaken.

Based on the conclusion of the study of the U.S. Department of Education concerning "Truancy", that is said to timing gift and on time in reaching to college are large factors on the "success and behavior" of the students (Zeiger, 2010). Hence it is necessary to value time and be on time as a student.

In the Philippines, only 57.8% of the national action check in secondary science were revealed in 2008 that is below from the government's target criterion level, that is 75% (Lapus, 2009). Additionally, Martin et. al. conjointly rumored that the mastery level in arithmetic and science of Filipinos are weak. After they graduate from high school, they got solely half-hour average correct answers in TIMSS that is very below the international average of 45 correct answers.

In the study of Espinosa, Monterola and Punzalan (2013), it appeared that Chemistry students realize the topic too abstract and mathematical for they begin categories with loads of expectations, queries and nice interest that aren't nourished as a result of, therefore, chemistry needs a special means of thinking to be ready to learn it.

To bridge the gap between the concepts discussed and the types of learners, team-based remedial instruction is introduced.

Team-Based Learning (TBL) according to Varpio et. is beached in theory and troth for it is a recent educational method that adjunct to existing methods the application of that can be affected by local factors such as space, availability of faculties' time, participation of students and other claims of the curriculum.

TBL aims to make the learning process more meaningful and engaging because that is their goal. More importantly, TBL creates enjoyable classroom experiences constructive for both instructors and their students for they become consort in the learning process (Sibley and Ostafichuk, 2013).

Based in this study, a Team–based remedial instruction is recommended to be used and tested to determine the efficiency in teaching Science specifically in the topics of atomic structure and periodic table of elements to enhance student's performance.

### Statement of the problem

This research determined the effect of Team-Based Remedial Instruction on the academic performance of Science 8 Learners at Risk of Dropping Out at Ronda National High School, Ronda, Cebu during the school year 2017–2018 as basis for a learning module. Specifically, it sought answers to the following questions:

1. What is the respondents' profile in terms of age, gender, combined parents' monthly income, family size, and home distance from school?
2. What is the respondents' level of academic performance in Science before and after the implementation of Team-Based Remedial Instruction in the areas of atomic structure and the periodic table of elements?
3. What is the respondents' attendance in percent in Science before and after the implementation of Team-Based Remedial Instruction?
4. Is there a significant difference between the respondents' level of academic performance in Science before and after the implementation of Team-Based Remedial Instruction, and their attendance before and after its implementation?
5. Based on the findings of the study, what Remedial Learning Module can be designed?

## METHODOLOGY

This study utilized a quasi-experimental research design to determine the effect of Team-Based Remedial Instruction on the academic performance of Grade 8 learners at risk of dropping out. A standardized 50-item test, adopted from the Regional Achievement Test 2010 and the National Achievement Test from 2011 to 2015, served as the primary instrument for both the pre-test and post-test. The overall flow of the study followed an input–process–output framework in which the inputs consisted of the respondents' profile, their performance levels before and after the intervention, their percent attendance, and the significant differences observed between pre-intervention and post-intervention measures. The 50-item questionnaire was administered prior to the implementation of the Team-Based Remedial Instruction to establish the pre-test scores, and the same instrument was administered thereafter to determine the post-test outcomes reflecting the effects of the intervention.

The research process involved organizing, sorting, tabulating, and analyzing the gathered data to facilitate quantitative interpretation. Frequency of Correct Responses (FCR), Mean Percentage Score (MPS), and the t-test formula were used to determine the significant difference in the academic performance and attendance of the respondents before and after the implementation of the remedial instruction. All data were treated systematically to generate clear implications regarding the intervention's effectiveness. The expected output of the study was the enhancement of students' academic performance in science through the development of a remedial learning module.

The study was conducted at Ronda National High School in Palanas, Ronda, Cebu during the third grading period of School Year 2017–2018. The school occupies a 4.6-hectare area with four two-storey buildings and maintains an average population of approximately 700 students per year. It offers junior and senior high school programs under the K–12 curriculum and is staffed by a principal, 36 teaching personnel, and three non-teaching staff including security personnel. Students come primarily from the municipality of Ronda, with some commuting from Alcantara. The community is largely composed of farming and fishing families, with some relying on relatives working overseas. Graduates of Ronda National High School pursue diverse fields, including engineering, medicine, agriculture, and academia.

The respondents of the study were selected through purposive sampling and were identified as learners at risk of dropping out. These Grade 8 students accumulated more than seven absences in a month, as reflected in Form 2, and had Science grades ranging from 73 to 75 during the first grading period, while their Grade 7 Science grades ranged from 75 to 76. The final group consisted of 16 males and 9 females, distributed across four Grade 8 sections with a total population of 206 students, of whom 24 met the criteria for inclusion in the study.

Before data collection began, the researcher identified the learners at risk of dropping out and oriented them regarding the purpose and objectives of the study, emphasizing confidentiality and voluntary participation. The pre-test was administered prior to the intervention, after which the respondents were organized into four groups composed of six members each to participate in the Team-Based Remedial Instruction sessions. During the intervention, students worked collaboratively by sharing concepts and ideas within their teams while the teacher acted as facilitator. After completing the sessions, the same 50-item instrument was administered as the post-test to assess changes in understanding.

The gathered data were analyzed using appropriate statistical tools. Percentage was used to describe the respondents' profile and attendance, while Frequency of Correct Responses, Mean Percentage Score, and the t-test were employed to determine significant differences between pre-test and post-test results. To interpret performance levels, the study applied a scoring scale in which scores from 90% to 100% were described as Outstanding, 85% to 89% as Very Satisfactory, 80% to 84% as Satisfactory, 75% to 79% as Fairly Satisfactory, and 74% and below as Did Not Meet Expectations. These descriptive equivalents were used to explain learners' mastery of basic chemistry concepts related to atomic structure and the periodic table of elements.

## RESULTS AND DISCUSSION

### Respondents' profile

The study involved a total of 24 learners at risk of dropping out (LARDO) from four Grade 8 sections of Ronda National High School, consisting of 19 males and 5 females. The respondents' profile was examined through variables including age, gender, combined monthly income of parents, family size, and home distance from school. In addition, the students' level of academic performance and attendance in science before and after the implementation of team-based remedial instruction was measured, and the significance of any changes was tested. These factors provided a comprehensive understanding of the learners' characteristics and the context in which the intervention was applied.

### Age and gender

Table 2 shows that the majority of respondents, 13 or 54.17%, were 16 years old, indicating that the test group consisted mainly of older students for their grade level. Only five students (20.83%) were 14 years old and below, while three students (12.50%) were either 15 years old or 17 and above. Research has suggested that as learners grow older, the correlation between age and academic achievement tends to decelerate (Coleman, Campbell, et al.). Similarly, Grissom (2004) concluded that there is a non-positive relationship between age and achievement. Regarding gender, 19 respondents (79%) were male, while 5 (21%) were female. Previous studies revealed a gender effect favoring males in overall science performance, particularly in physical sciences,

though the advantage varies and some studies indicate negligible differences (Lee & Burkam, 1996; Hedges & Newell, 1995). This distribution underscores the need to consider both age and gender when analyzing academic outcomes.

Combined parent's monthly income

Economic status was also considered as it influences academic performance. The data indicated that a significant proportion of respondents, 15 or 62.50%, came from families earning ₱5,000 or less per month. Four respondents (16.67%) had family incomes between ₱5,001 and ₱10,000, while very few had higher earnings. This highlights that most learners belonged to low-income households, consistent with Norris (2000) and Poongothai Selvarajan et al., who identified socioeconomic status as significantly correlated with academic achievement.

Family size

Family size is another factor affecting student performance. The study showed that 14 respondents (58.33%) came from families with seven or more members, six (25%) had six members, three (12.50%) had five members, and only one (4.17%) came from a family of four. Research by Cobb-Clark and Moschion indicated that larger family size may negatively influence children's performance through both objective measures, such as test scores, and subjective assessments by teachers. This emphasizes the potential challenges that LARDO students face at home that could impact their academic performance.

Home distance from school

Home distance also affected students' ability to attend science classes regularly. Data revealed that 13 respondents (54.17%) lived 7 km or more from school, 5 (20.83%) lived 6 km away, 3 (12.50%) lived 5 km away, one (4.17%) lived 4 km away, and two (8.33%) lived 3 km or less from school. Long distances to school have been shown to negatively affect attendance, punctuality, and performance (Onderi et al., 2014; Oriko, 2002; Reche et al., 2012), which explains part of the learners' academic difficulties.

Students' level of academic performance

The respondents' academic performance was measured through pre-test and post-test results in science, specifically focusing on the topics of atomic structure and the periodic table of elements.

Atomic structure

In the pre-test, 23 respondents (95.83%) scored 74% and below, categorized as "Did Not Meet Expectations," showing difficulty in grasping basic concepts. Only one student (4.17%) achieved a "Fairly Satisfactory" rating. The post-test revealed significant improvement, with 20

respondents (83.33%) achieving a "Fairly Satisfactory" rating (75–79%), indicating that learners understood the concepts but still had challenges applying them practically. The results demonstrate that team-based remedial instruction effectively enhanced academic performance, aligning with studies by Weegar and Pacis (2012) and Rummel (2008), which emphasize the development of intrinsic motivation and knowledge construction through collaborative learning.

Periodic table of elements

All respondents scored 74% and below in the pre-test, again classified as "Did Not Meet Expectations." After the intervention, most learners achieved "Fairly Satisfactory" ratings, with 19 respondents (79.17%) in this category. This substantial improvement reflects the effectiveness of team-based remedial instruction in facilitating understanding, supporting the findings of Humphrey et al. (2013) and Philip B. Palmer, who noted that remedial and team-based strategies increase comprehension, self-esteem, and consistent study habits among low achievers.

Respondents' attendance

Attendance before and after the intervention was analyzed over a total of 26 science class sessions. Before the implementation, 16 respondents (66.67%) attended 10 days or fewer, indicating low engagement, while only two students (8.33%) attended 20 days or more. Post-intervention, 19 students (79.17%) attended 20 days or more, with only one (4.17%) attending 10 days or fewer. This demonstrates that team-based remedial instruction significantly increased student interest and participation in science classes, consistent with Kagan (2014) and McGoldrick (2012), who emphasized cooperative learning and equal participation in group activities.

Summary of respondents' performance

Overall, the learners at risk of dropping out showed significant positive outcomes following the implementation of team-based remedial instruction. The average mean percentage score across atomic structure and the periodic table of elements increased from 24.82% ("Did Not Meet Expectations") to 76.82% ("Fairly Satisfactory"), highlighting the effectiveness of the instructional strategy in improving both understanding and application of scientific concepts.

Test of significant difference

A t-test comparing pre-test and post-test scores revealed a computed value of 22.92, exceeding the critical value of 1.684 (df = 46), leading to the rejection of the null hypothesis. This indicates a statistically significant improvement in academic performance due to the intervention, corroborating findings by Poongothai Selvarajan et al., Neela Jangid et al., and Ken (2006), who noted that remedial and team-based instruction enhances retention and comprehension. Similarly, the comparison of attendance before and after the intervention showed a computed value of 3.462, again exceeding the critical value, confirming a significant increase in class attendance. This reinforces that team-based learning encourages active participation and fosters collaborative accountability among students, ultimately enhancing both engagement and academic outcomes.

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## CONCLUSION

This study investigated the effectiveness of team-based remedial instruction in teaching Science at Ronda National High School, focusing on students' personal profiles, academic performance, and attendance before and after the intervention. The analysis of respondents' profiles revealed that the majority of the learners, 13 or 54.17 percent, were 16 years old, while 19 students (79%) were male and 5 (21%) were female. Most of the respondents came from low-income families, with 15 students (62.50%) reporting a combined parental monthly income of ₱5,000 or below. Family size also emerged as a notable factor, with 14 learners (58.33%) belonging to families of seven or more members, and more than half of the respondents, 13 students (54.17%), residing seven kilometers or more from the school. These factors collectively highlight the contextual challenges faced by learners at risk of dropping out, including socioeconomic constraints, large household responsibilities, and long commutes, all of which may influence academic engagement and performance.

The study further demonstrated the positive impact of team-based remedial instruction on students' academic performance. In the topic of atomic structure, learners achieved an average mean percentage score of 77.04, while in the periodic table of elements, the average score reached 78.46, both categorized as "Fairly Satisfactory." Overall, the pre-test and post-test comparisons indicated a significant increase in mean performance, rising to 76.82 percent after the implementation of team-based learning. These results suggest that the instructional strategy effectively enhanced learners' understanding of key science concepts, supporting both comprehension and practical application. In addition to academic performance, students' attendance in science classes improved markedly. Before the intervention, many learners exhibited low participation due to various personal and contextual factors, but post-intervention attendance rose to a mean of 18.79, reflecting heightened engagement and interest in science classes. This increase in attendance further emphasizes the motivational and collaborative benefits of team-based learning, as students became more active participants in the educational process.

In light of these findings, it can be concluded that the implementation of team-based remedial instruction significantly enhanced both the academic performance and class attendance of learners at risk of dropping out. The strategy proved effective in addressing learning difficulties while fostering cooperative participation, making it a practical and implementable approach within the classroom. Based on the results of this study, it is recommended that the implementation of team-based remedial instruction be continued and expanded, as it provides an effective framework for supporting students' academic growth, engagement, and overall success in Science.

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