
Improving Students' Rate of Participation Through the Use of Interactive Boards for Grade 7 Science Students of North Fairview High School: A Lesson Study on Living Things and Their Environment (2nd Quarter)

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Abstract — This Special Program, “Improving Students’ Rate of Participation Through the Use Interactive Board for Grade 7 Science Students of NFHS” A Lesson Study : Living Things and Their Environment - 2nd Quarter is a paper that explores the innovation made by the Grade 7 Teachers to promote teaching science through synchronous inquiry approach, practice collaborative lesson and development among Living Things and Their Environment teachers in this pandemic and improves hard to teach and hard to learn topics by engaging through different interactive boards and applications during the second grading period at North Fairview High School.

The study was implemented by Grade 7 Science teachers and selected sections in Grade 7 of North Fairview High School, District 5 in the Division of Quezon City.

After gathering, analyzing and tabulating results, conclusions and recommendations were formulated. The results of this study provide information to be used and followed when teaching the same lesson.

I. Introduction

When adversities and calamities occur, schools need to be strong and find new ways to continue the teaching and learning activities. One result of this world health crisis is the movement to online learning modalities to lessen the risk of face-to-face interaction. The sudden shift has given us problems especially for learners without access to technology. When online learning modality is used, the space between those who have internet connection and those that without widened the gap. And this has been a challenge for us teachers and to our students.

Considering this situation, we, the Grade 7 teachers come up with a design to meet the needs of our students. This study discovered the challenges and issues in teaching and learning online as a result of the COVID-19 Pandemic. The study engaged mixed methods of teaching our students in the public higher education. It was found out that during our school lockdowns, the teachers made several adjustments in teaching and learning techniques to be implemented to our school. Most of our students had difficulty complying with the learning activities and requirements

due to limited or totally no internet connections. But still we wanted to show the role of technology in the teaching and learning environment.

Statement of Objectives

During the 2nd quarter, our team decided to conduct a Lesson Study. Our aim is:

- 1) to enhance teaching and learning process, and
- 2) to improve students' rate of participation using different apps.

When doing a research, teachers usually work independently, but nowadays, working in teams become more popular. This is what we called collaboration. Because we believe that through collaboration we could have a positive impact on each other, and contribute more to school improvement. In working together as a team, we shared responsibilities, provides feedback and build our trust with one another.

Our partners from UPNISMED introduced to us CLRD, Collaborative Lesson Research and Development (CLRD), a school-based model of continuing professional development for teachers. This is a version of Lesson Study which patented in Japan. It is the JICA or Japan International Cooperation Agency started it all. A peer-to-peer collaborative learning practice where primary or secondary level teachers share knowledge and skills to continuously improve teaching through a monthly cycle of Plan-Do-See activities.

Background of the Study

Our team decided to have a Lesson Study on one concept in Biology that usually confuse or give misconceptions to our students, the Types of Reproduction, (Asexual and Sexual).

We carefully planned all the meetings to be sure that all the members of the team can attend the sessions. We have identified the topic that we are going to focus on, looked for apps online and even activities online that can be used for the implementation. We have also prepared our Detailed Lesson Plan and chose the dates of the implementation. After these preparations, we will invite our partners from UP NISMED to review our work and asked their comments and suggestion to improve our lesson.

We are aware that doing this Lesson Study can also help us improve our teaching skills and delivery of the lesson. Our partners from UP NISMED will watch us as we implement our lesson to our selected sections. After each implementation, they will give us comments and suggestions on which part of the lesson should we improve on.

What is a Lesson Study?

Lesson Study is a collaborative training of inquiry in which teachers design a lesson plan and work to improve it and its execution after observing its instruction. Initiating in Japan, LS is

renowned in international research as a useful instrument for teachers' training and professional development. However, research reveals that fallacies arise when LS is adopted outside of Japan., and different authors have called for further theoretical development to increase understanding of the process. In response, they have evaluated three LS' key components, (phases, product and teachers' cooperation).

UPNISMED is introducing Collaborative Lesson Research and Development (CLRD), a school-based model of continuing professional development for teachers. This is an adaptation of lesson study which originated in Japan. The aim of CLRD is to ultimately improve student learning by enhancing the competence of teachers as they collaboratively plan, implement, and improve lessons guided by a long-term goal and sub goals that they formulate.

Interdisciplinary Teaching

Teachers also should collaborate to create interdisciplinary lessons. These types of lessons span more than one subject at a time. For example, an English teacher could have students study the novel "The Grapes of Wrath" while students were learning about the Great Depression during their history class. According to the College Board, this type of teaching enhances student creativity, increases achievement and allows students to hone their critical thinking and communication skills.

Collaborative Learning

Collaborating with classmates can have positive results for students, too. When students participate in collaborative learning groups, achievement increases. Dr. Spencer Kagan, a respected educational researcher and author, claims there are more than 500 studies that show evidence of increased achievement for all types of students when they work together in small groups to solve a problem or reach a common goal. Students also get the opportunity to learn about diversity and how to work with others and be part of a team.

Teaching Improvement: It is an ideal venue for teaching improvement. In contrast to workshops and seminars that discuss general teaching strategies, lesson study looks directly at one's classroom. Teachers focus on how their students learn and what kinds of instructional activities support student learning and thinking. By focusing on one lesson, instructors can learn about students, instruction, goals, and subject matter without undertaking extensive course revision.

Instructional Materials: Lesson study results in a field-tested lesson and materials that can be used and adapted by other instructors. The systematic, evidence-based approach makes it possible for teachers to build on one another's work. By the end of the lesson study process, teams produce knowledge about how students learn from instruction.

Teaching Community: The Lesson study process helps build communities of practice around teaching. Instructors report that collaborating with their peers is a particularly rewarding experience. Lesson study cultivates mutual understanding of goals, teaching practices and student learning among teachers.

Statement of the Problem

1. What is the assessment of students in terms of:
 - a. topic
 - b. online activity
 - c. lesson implementation
 - d. student involvement?

Scope and Limitations

The Collaborative Lesson Research and Development was conducted with web-conferencing tool like [Google](#) meet. This study enables teachers carefully explore how student's thinking, learning and behavior change as a result of the lesson. Also, lesson study leads to instructional improvement as teachers become more knowledgeable about how their students learn and how instruction affects student thinking.

The coverage of the study program is limited to the topics for the second grading period of Grade 7 science students under MELC Module 6 Sexual and Asexual Reproduction. This study is divided into three stages: Planning Stage, Implementation Stage and Evaluation Stage.

Significance of the study

The result of this study will be a great help to the Department of Education, School administration, teachers and students.

For the Department of Education, this study may provide insights to resolve problems in planning; thus, develop a better curriculum for the students.

For the school administration, this study program helps them learn the basics in conducting study. This may also serve as how to conduct lesson study to reinforced professional development training for teachers.

For the teachers, it could gain insights from other teachers/schools. Becoming more reflective teachers with immediate feedback on lessons. Furthermore, allows teachers to enjoy satisfaction in teaching and seeing self as a professional that can institute change in the classroom and the larger community.

For the students, it gives the opportunities to work together in groups where they could learn more from each other. They will also develop communication skills, allows them to discover & organize information, and equip them with problem-solving and decision making. Through lesson study, learners enhance a variety of social skills. It could also train students to become life-long learners.

RELATED LITERATURE AND STUDIES

Synchronous Learning

Synchronous learning refers to all types of learning in which learners and teachers are in the same place, at the same time in order for learning to take place. This type of approach to learning may include in-person classes and even live online meetings wherein the whole class can gather thru the use of technology.

According to Angelone et.al (2020), synchronous learning has the potential to increase the students' presence and cooperation and improve the overall performance of the students if utilized correctly.

The use of modern technology has played a pivotal part in the teaching-learning process during this pandemic. Academic institutions saw the need to invest in technology-based learning spaces so they can cater to the needs of their students without sacrificing the quality of education.

Al-Arimi (2014), emphasized that synchronous learning through synchronous learning, students will have more experiences because they can also learn from using online communities and networks since this type of learning also supports "learning through reflection and discussion" and empowers learners to manage their way of learning.

Integrative Teaching and Learning

Integrative learning is an approach where the learner brings together prior knowledge and experiences to support new knowledge and experiences. By doing this, learners draw on their skills and apply them to new experiences at a more complex level. The concept behind integrative learning is that students take ownership of their own learning, becoming critical inquiries who are able to make meaningful connections between different disciplines and utilize critical thinking to real-life problems (Mansilla, 2008).

Samel (2021) asserted that the primary role of educators is to create learning environments that service a diverse student body. To be successful, this environment should focus on the ability of the student to demonstrate their level of understanding for the topics posed rather than focusing on just the grade. The idea behind the concept of integrative teaching and learning is that students receive maximum learning by acquiring knowledge and skills in more than one area in the same time-frame. This can be done by collaborating with other teachers and discussing grade-level standards and brainstorming ideas on working together to combine ideas.

Collaborative Lesson Research and Development

Lesson Study is a collaborative professional development approach focused on student learning. It is a collaborative professional development approach that provides a framework for improving classroom learning and teaching.

Collet (2019) highlighted that Unlike scripted curricula that strip teachers of professional decision-making, Lesson Study values teachers by expecting them to be agents of improvement in their own classrooms. Collaborative lesson study provides structures for attending to students' interests, knowledge, and values when planning, teaching, reflecting, and revising instruction. It also shows educators how to use Lesson Study to design culturally responsive, differentiated instruction for the K-12 classroom as participating in a lesson study provides a step-by-step guide to develop professional learning communities; increase teacher motivation, efficacy, and knowledge; and support improvement adapted to local contexts.

Takahashi (2016) asserts that lesson study should be an integral part of teaching and should involve not only the teachers and students but the whole community as well in order to address learning challenges. Another important part of the lesson study is the inclusion of knowledgeable others who will provide support and deep expertise in the content and provides comments at the post-lesson discussion.

In addition to this, McDougall (2018) contended that CLR is not just for the improvement of teaching and learning within the team, but also for improving teaching and learning more broadly. Thus, Lesson Study should include a structure or process for disseminating what is learned from each research lesson to a larger community.

Reflective Teaching

Reflective teaching is a holistic thought that enables a teacher to make choices and take alternative actions and allows teachers to think to improve teaching and learning decisions in the classroom. Reflective teaching involves examining one's underlying beliefs about teaching and learning and one's alignment with actual classroom practice before, during and after a course is taught. When teaching reflectively, instructors think critically about their teaching and look for evidence of effective teaching. Brookfield (2017) lays out four crucial sources: “students’ eyes, colleagues’ perceptions, personal experience, and theory and research.” Instructors can use various tools and methods to learn from these sources and reflect on their teaching, ranging from low-key to formal and personal to inter-collegial. For example, reflective teaching may include self-assessment, [classroom observations](#), consideration of [student evaluations](#), or [exploration of educational research](#). Because students and their needs are different, reflective teaching is a continual practice that supports effective and student-centered teaching.

II. Methodology

Introduction

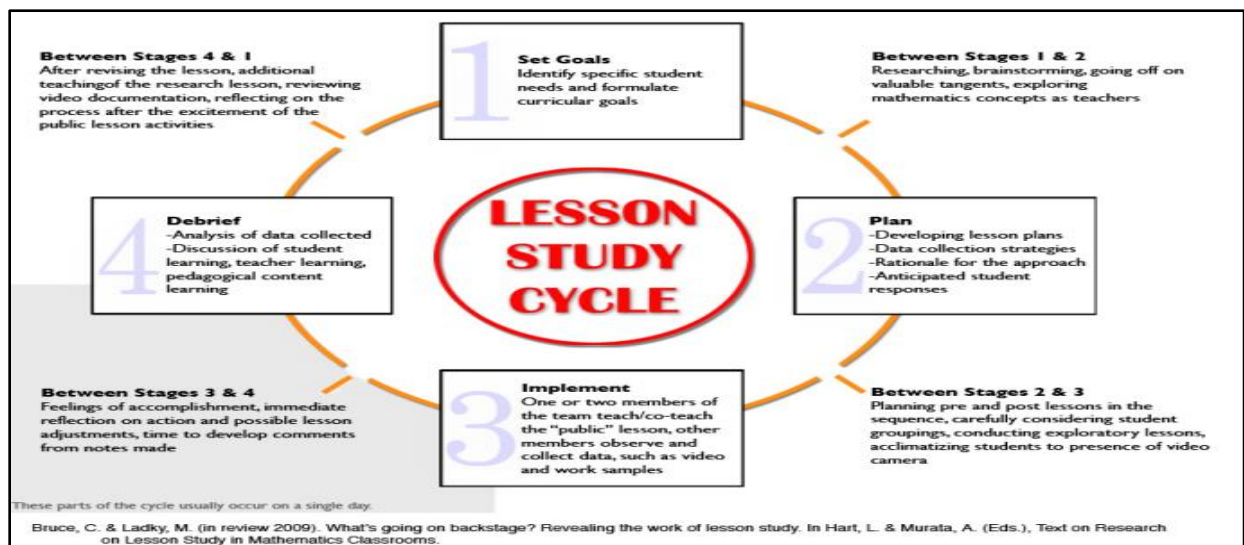
The Covid-19 pandemic has altered our way of life. In education, for example, we have been in a dramatic change from face-to-face to distance learning. And this has brought us to a whole new world of problems. Since there are no face-to-face interactions in class, student participation was also affected. Teachers have to think of ways to motivate the students to participate and keep them engaged during virtual sessions.

With this situation, the Grade 7 Science teachers conducted a lesson study with the guidance of our head teacher and partner experts from UP NISMED. Lesson Study is a method of professional development that encourages teachers to reflect on their teaching practice through a cyclical process of collaborative lesson planning, lesson observation, and examination of student learning (Lensky, S.J., & Caskey, M.M., 2009).

This lesson study aims to promote student learning by enhancing teachers' competency. Teachers collaborate to plan, implement and revise lessons to increase students' participation specifically, with the help of interactive boards and activities.

Strategy

The lesson study follows a cyclical process of collaborative lesson planning, lesson observation, and examination of student learning (Lensky, S.J., & Caskey, M.M., 2009).



The Lesson Study Flowchart

The UP-NISMED is a research unit and an extension arm of the University of the Philippines attached to the College of Education whose goal is to raise the level of teaching and learning of science and mathematics in the Philippine educational system. They provide helpful insights in the development and implementation of a lesson study. They also develop and implement innovative and research-informed programs for teachers and teacher educators in science and mathematics.

A. Set Goals

During the preparation phase, a series of meetings were done to identify the topic for implementation, set the specific goals for the study, and prepare the matrix and timeline of activities. We have chosen the topic of Sexual and Asexual Reproduction because it is one of the least mastered topics in the second quarter.

B. Planning

The following phase entails drafting a lesson plan and activities for implementation. Under the direction of our team leader and with the assistance of our LAC coach, a detailed lesson plan was created. Following the development of the lesson plan, each teacher offered their suggestions for activities to be used in the implementation. And we've agreed to use our teacher-made interactive activities using *WordWall* and *Liveworksheet* applications.

Our team presented the lesson plan and interactive activities to the UP NISMED Biology team to be checked and critiqued. The UP NISMED team gave us suggestions on how we can improve the flow of our lesson and the activities that we are going to use in class. They specifically pointed out to include all the possible answers from the students so that we can be prepared on how to process it during the implementation. We also conducted LAC sessions about using interactive boards in class discussions, where we talked about and practiced using *Whiteboard.fi*, *Classroomscreen*, and *Jamboard*. In the latter part of this phase, we have finalized our lesson plan and revised our lesson presentation based on the comments and suggestions of the academic experts from UP NISMED.

C. Implementation

The implementation phase is where we put everything into action. *Google Meet* is used to set up the class virtually. Each teacher implements the agreed lesson and activities in their selected section and schedule. Each implementation was observed by our head teacher, Dr. Nazareth, the UP NISMED biology team headed by Dr. Treyes, and SDO-QC PSDS Dr. Levita Cardenas.

D. Debriefing / Post Conference

After the implementation, it is now time to review what transpired in the session. The lesson study team and the observers conduct a post-conference where we share ideas and observations. Academic experts from UP-NISMED discuss the positive aspects of the lesson implementation as well as suggestions for improvement for the next implementer. After the post-conference, the team reconvenes and goes over the areas of the lesson that the experts highlighted. This phase is repeated until the last implementer.

Sampling

Three sections from Grade 7 were selected to take part in the implementation of the lesson study. Each section was given the same type of lesson and the same set of activities.

Data Collection

The data for analysis were taken from the reports submitted by each teacher implementer. These include the students' attendance during the implementation and the score from the activities given during the class (e.g. *liveworksheet* and *wordwall* activity).

The scores are presented in tabulated format and interpreted based on the following:

- a. the number of students who participated in the activity during the implementation vs. the number of attendees
- b. the number of students who got a passing score in the activity before and after the discussion proper

Feedback forms were also given to students and teacher-implementers to gather insights during the implementation of lesson study. Below are the questions for the students' and teacher's feedback form.

The importance of working together to provide a more student-centered virtual learning environment for our students sums up the responses to the first question. We must work collectively, share ideas, and learn new things from one another for the team to come up with a more effective lesson flow that will improve student participation.

The team conducted this lesson study to ensure that students get to participate despite the current situation. We wanted to create engaging exercises for our students that would inspire them to participate actively, and deciding which ones would be the best fit was a difficulty. Aside from that, since students are not used to having observers in class, encouraging them to participate during the implementation doubled the pressure on the implementer.

The team would agree that the whole process of the lesson study fosters collaboration among the members. It allowed us to share our ideas and learn something new from one another. The lesson study also allowed us to explore new things on how we can improve our craft.

From planning through implementation and debriefing, doing a Lesson Study takes time. Setting up meetings with all of the members in attendance requires time management. It's challenging, but the team has figured out how to make it work.

When it came to the team's advice, the comments emphasized the importance of having the experts there from the start. The group also suggested providing materials that allow students to talk more and may be accessible offline. Finally, come up with instances that students are more familiar with, situations to which they can easily relate.

The findings will demonstrate how the use of interactive games and boards affects the rate at which students participate in synchronous sessions.

Through lesson study, we were able to develop a lesson that encourages students to join in the discussion and make it enjoyable for them.

The results will help us determine the effectiveness of using interactive activities, and boards in synchronous class to improve student participation. Teachers shared their perceptions on how the lesson was received by the learners.

In a lesson study, teachers carefully explore how student learning, thinking and behavior change and how they cope with the situation. The practice of lesson study in this pandemic time can lead to instructional improvement and new discoveries in using interactive application. Also, teachers become more knowledgeable about how their students learn and think and how instruction affects student's thinking.

Description of Respondents

The study was utilized by Grade 7 junior high school science teachers and students in Quezon City if the lesson study improved the student's rate of participation in science using interactive boards.

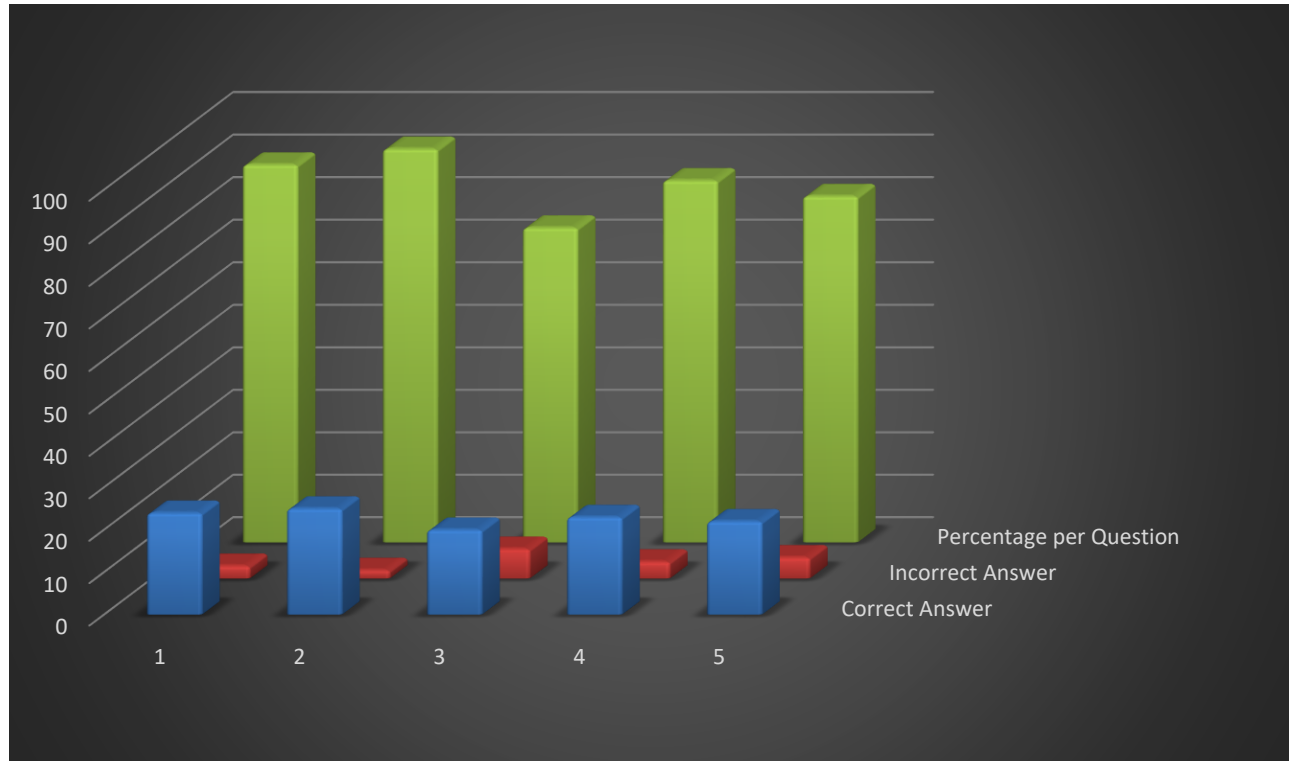
In this time of pandemic, most of the teachers in public schools are adjusting to the new curriculum implemented by the Deped. Grade 7 science teachers just like others, experience a dilemma of what resources and strategies particularly in the use of technology should be used to increase the performance of students in science.

Students participated to the different interactive apps during the implementation of the lesson.

III. Results and Discussion

Presentation, Analysis and Interpretation of Data

First Implementation Summary of Scores



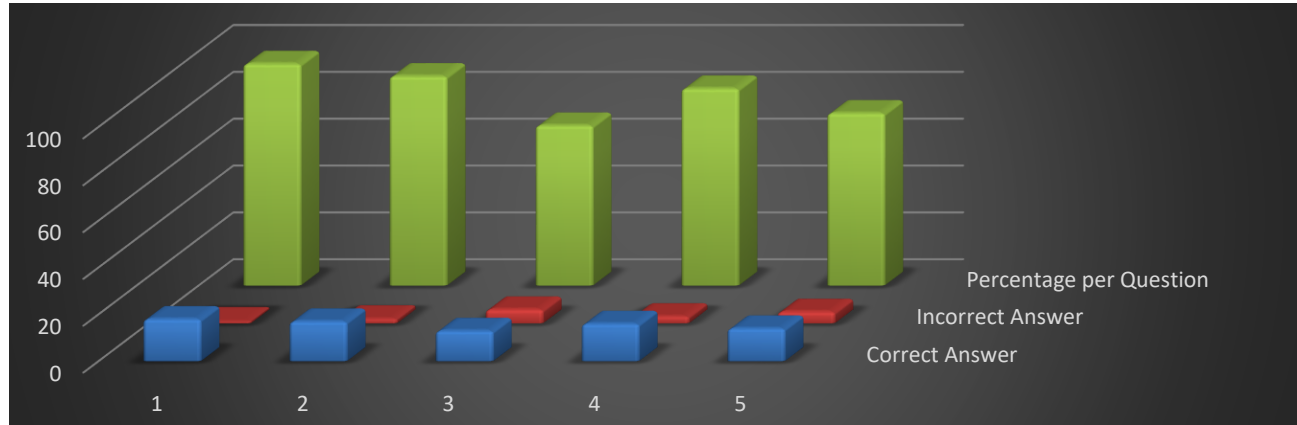
Grade 7 - Edelweiss

| | | | | | |
|-------------------------|----|----|----|----|----|
| Correct Answer | 24 | 25 | 20 | 23 | 22 |
| Incorrect Answer | 3 | 3 | 7 | 4 | 5 |
| Percentage per Question | 89 | 93 | 74 | 85 | 81 |

Figure 2: Graphical Presentation on the Summary of Scores of Grade 7 Edelweiss during the 1st Implementation (Liveworksheets)

Data show the scores and percentage of students' evaluation after the first implementation. Based on the table, questions numbers 2 got the highest percent which has 93 and 25 students who got the correct answer.

Second Implementation Summary of Scores Grade 7 - Hyacinth

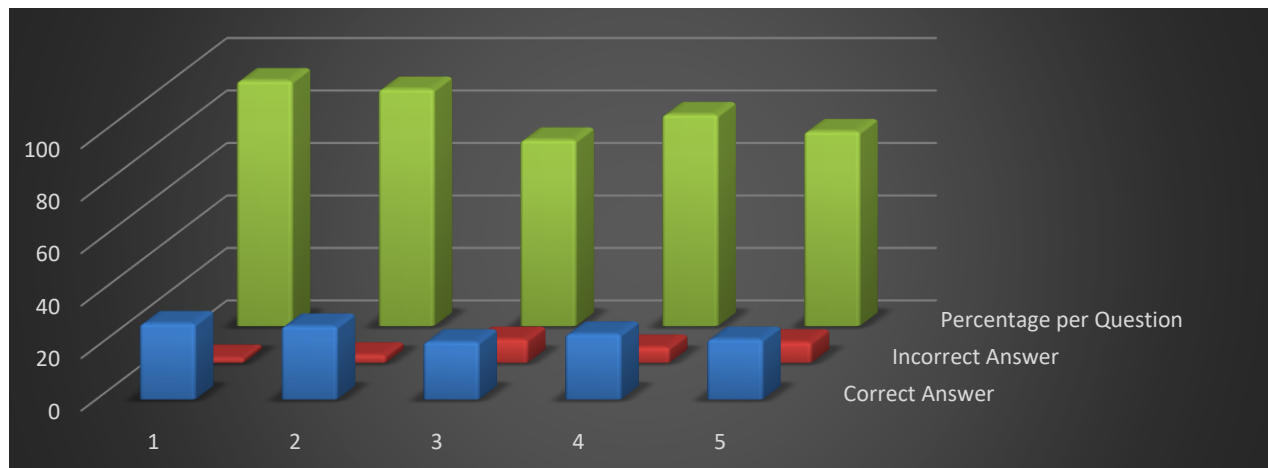


| | | | | | |
|-------------------------|----|----|----|----|----|
| Correct Answer | 18 | 17 | 13 | 16 | 14 |
| Incorrect Answer | 1 | 2 | 6 | 3 | 5 |
| Percentage per Question | 95 | 89 | 68 | 84 | 74 |

Figure 3: Graphical Presentation on the Summary of Scores of Grade 7 Hyacinth during the 2nd Implementation (Liveworksheets)

Data show the scores and percentage of students' evaluation after the first implementation. Based on the table, questions number 1 got the highest percent which has 95 and 18 students who got the correct answer.

Third Implementation Summary of Scores Grade 7 - Adelfa



| | | | | | |
|-------------------------|----|----|----|----|----|
| Correct Answer | 29 | 28 | 22 | 25 | 23 |
| Incorrect Answer | 2 | 3 | 9 | 6 | 8 |
| Percentage per Question | 94 | 90 | 71 | 81 | 74 |

Figure 4: Graphical Presentation on the Summary of Scores of Grade 7 Adelfa during the 3rd Implementation (Liveworksheets)

Data show the scores and percentage of students' evaluation after the first implementation. Based on the table, questions number 1 got the highest percent which has 94 and 29 students who got the correct answer.

Findings

The findings of this study suggest that the lesson study process plays an important role and has positive effects in the development on enhancing teachers' knowledge and skills in these difficult times.

This program also suggests that improving instructions and collaborations with colleagues will continue no matter what the situation is providing enough tools leads to the growth and development of teaching and learning.

Collaborations can not only do in the classroom but also in virtual session. This implies that when teachers work together despite of hardships, they form professional relationships and contributes to the school improvement and students' success.

IV. Conclusion

After a series of studies, discussion and evaluation, CLRD showed that it provides continuous professional growth among teachers involved and develops critical thinking while preparing for the lesson plan and activities. The CLRD provides opportunities for the teachers to experience the benefit of teacher collaboration that could also enhance personal growth of teachers.

V. Recommendations

The following recommendations are given in order to strengthen CLRD and fully equip the teachers in implementing the program.

1. Time and effort must be given during the entire process of the study and implementation of the program.
2. The focus of the critic is on the design and structure of the research lesson constructed by the group not on the individual teacher.
3. During unexpected situations like the corona virus outbreak, teachers should always prepare and ready at all times. Having a strong internet connection and knowledge in technology really helps a lot in conducting the lesson study.