THE EFFECTIVENESS OF RADIO-BASED INSTRUCTION (RBI) THE GRADE 10 LEARNING ACTIVITY SHEET (LAS) IN THE 2ND QUARTER OF THE SCHOOL YEAR 2020-2021 OF DANAO INTEGRATED SCHOOL

Charmaine R. Somosa[1*], Harjolan S. Salutan[2]

[1]Danao Integrated School, Department of Education- Division of Sarangani, Philippines
[2]Laginan Integrated School, Department of Education- Division of Sarangani, Philippines

Abstract

This research paper presents the impact of Radio-Based Instruction on Learners performance in their English 10 subject for the SY 2020-2021. This research paper investigated the effectiveness of radio based lessons using radio scripts assisted by the Learning Activity Sheet excerpted from the Self-Learning Module in the SY 2020-2021. The researcher employed a one group pre-test-post-test experimental research design and validated research instrument for the pre- and post-test assessment. This study revealed that there is a significant difference between the pre-test and post-test result of the Grave XI learners of Danao Integrated School. It turned out that after the Radio Based Instruction (RBI) intervention was conducted, learners' mastery level has significantly changed from Did Not Meet Expectation to Satisfactory. A sig. value (w-value) of 0.00 which was less than 0.05 implied that there is a significant difference between the learners' pre and post-test result. Therefore, Radio Based Instruction as an intervention in English 10 of the Grade 10 Learners of Danao Integrated School has a positive implication.

Keywords: Education; Radio-Based Instruction (RBI), Learning Activity Sheet (LAS)

Introduction

Education has always been deemed the most powerful tool to battle against poverty and illiteracy (Mandela, 2017). From primary to higher education, every country has worked hard to establish and ensure a high standard of education. Countries' realm of education always ensures a gradual development each year of high standard quality education to make each learner globally competitive by ensuring that there will be no disruption.
However, education delivery in public and private sectors was disrupted from face-to-face to distance learning. It caused the paradigm shift in education at the international level, which led to two-thirds of the academic year being lost worldwide (UNICEF, 2020).

When mandated by state education agencies, educational sectors disallowed the delivery of the curriculum standard inside the classroom. Instead, education took place using modules and online classes. With the case of Philippine education, primary education was forced to adapt to these changes. Instructional Modality was quickly changed from face-to-face instruction to distance learning modalities. Distance Learning modality had been delivered through online learning using the internet, modular learning, radio-based instruction, or television. With the realization of the distance learning modality, teachers were tasked by the department to create, adapt, and utilize self-learning modules and learning activity sheets to deliver the curriculum standards stipulated in the Most Essential Learning Competencies (MELC) (San Antonio, 2020). This aided teachers and students in determining learning objectives based on the content and performance requirements required for effective distance learning training (Pascua, 2020).

Danao Integrated School has been one of the schools which implemented a distance learning modality since it was convenient for the school and for the learners as it was in one of the remote areas of the Municipality of Malungon, specifically at Sitio Danao, Tamban, Malungon, Sarangani Province. Besides, learners' homes have been located 5 to 10 kilometers away from the school. Therefore, learners needed to travel by foot as part of the distribution and retrieval of modules.

Danao Integrated School utilized the printed modular distant learning mode where modules were to be given and collected every week. Thus, the school was confronted with the problems in the performance level of the learners in

the first quarter of the S.Y. 2020–2021 in English since it was at the level of "Fairly Satisfactory," or 76%. In confirmation of this, Grade 10 learners turned out that they opted not to submit some of their modules in English subject in the 1st quarter since they had no answers. It emphasized that teachers' presence during the learning process was highly required since it was crucial to positively impact learners' skills development and improve performance (Henik, 2018). Also, their presence was creating the perception for learners that they were right there with them in the process of learning (Faculty Research Hub, 2022).

The present problem of Danao Integrated School had no doubt was one of the effects of the COVID-19 pandemic. Grade 10 learners' first-quarter performance in English proved that modules were not enough. On the other hand, Radio-Based Instruction delivery of the curriculum since it was implemented in other schools in India, where Ho and Thukral (2009) stated in Olakulehin (2016)'s work that the use of radio programs was successful in expanding access and quality of distance education. However, this process occurred when learners listened to their teachers in the classroom, not at home with their parents. Thus, this study aimed to determine the effectiveness of radio-based instruction by having learners listened to the lessons in English subjects while they were at home with their parents.

Materials and Methods

Research Design

The one-group experimental design was employed in this study to investigate the effectiveness of radio-based instruction in English 10. This experimental research design was done using one instrument applied to a single group of respondents. The researcher gathered the data using the same instrument before and after the conduct of the experiment, and the outcomes were assessed over time (Paulus et al., 2013).

Furthermore, a single-group experimental research design was strictly observing the two important points: before the treatment and after the treatment. The change in the outcome of the interest was presumed to be the result of the intervention. There was no control group employed (Chiang et al., 2015).

Research Locale

This study was conducted in Danao Integrated School, one of the schools located in East Malungon District, and situated in the Municipality of Malungon, Province of Sarangani. Malungon East District is composed of four integrated schools and one National High School.

This school is strategically located at Sitio Danao of Brgy.Tamban, Malungon, Sarangani Province.

Study Subjects

The subjects were the 30 officially enrolled Grade 10 learners in Danao Integrated School for the school year 2020-2021. Each of the learners' residences, as verified by the researcher, was equipped with a transistor radio through their solar panel compartment, which was one of the considerations made by the researcher. Furthermore, the Sangguniang Kabataan of Barangay Tamban contributed to the study's success by supplying transistor radios and flash drives, that the learners utilized to listen to the radio broadcaster's lesson recordings. According to Fraenkel and Wallen (2006), as cited by Garing (2016), if the population was small, the most appropriate strategy to get the respondents is census or the entire population. This strategy was used when all members of the total population were involved as the subjects.

Research Instrument

This research paper employed one research instrument utilized for pre-test and post-test. The researcher constructed a teacher-made research instrument based on the table of specifications (TOS), and coverage of the research instrument was based on Most Essential Learning Competencies (MELC) of Grade 10 English. Moreover, these competencies were illuminated through the Self-Learning Module and the Learning Activity Sheet (LAS). All of these materials were validated, and the office of Curriculum Implementation of the Division of Sarangani ensured certification on their use. This was to ensure the validity of the researcher's utilization of the learning materials as the basis for the

construction of the research instrument. The utilization of one research instrument, both the pre-test and post-test, was made possible in relevance to the study conducted by Garing (2016), Shek and Sun (2012), and Napila (2019). The researcher ensured that experts validated the materials used in the study. These materials were the Self-Learning Modules, Learning Activity Sheet, and the researcher's radio-lesson scripts.

On the other hand, a team of experts had validated the test items with these criteria (see Appendix C). To further establish the research instrument's validity, it was subjected to item analysis. However, before doing so, this was pilot tested with a group of learners at the same grade level at a nearby school, with the intention of determining the acceptability of the items and the following instruction from the examiner's perspective. This trial was also undertaken to see whether each test item was suitable for improvement.

After the pilot testing, items were analyzed using the U-L index method, and twenty-seven percent of the upper (U) and lower (L) groups were taken (Stocklein 1957). This test was conducted among 30 pupils, and the first ten and the last ten scores were taken. After this, a table for item analysis was prepared, computing the index of discrimination of each item. Items with difficulty indices of 0.20 to 0.80 were retained (see Appendix M).

After the pilot testing of the research instrument, it was found out that 37 items were retained and are suitable for this study. the item numbers 16, 22-24, 34, 37, 42-44 and 47-50 were rejected. (see Appendix M).

To further strengthen the research instrument used in this study, the researcher also subjected the research instrument to a reliability test, where split-half reliability was used. A common technique used when evaluating the reliability of the half test is the odd-even split-half technique. This technique was done by splitting the test into two, where the subjects' scores on the odd-numbered items (X variables) were correlated with their scores on the even-numbered items (Y variables). Results were interpreted using the Pearson Product Moment Coefficient Correlation. To interpret correlations, the following criteria were utilized:

Table 1. Pearson Product Moment Correlation Interpretation

R	Description
Between $\pm$ 0.60 to $\pm$ 1.00	High correlation
Between $\pm$ 0.60 to $\pm$ 0.79	Moderate-High Correlation
Between $\pm$ 0.40 to $\pm$ 0.59	Moderate Correlation
Between $\pm$ 0.20 to $\pm$ 0.39	Low correlation
Between $\pm$ 0.01 to $\pm$ 0.19	Negligible Correlation

The researcher chose to have 30 items in the research instrument, and it was subjected to the reliability test. As the obtained "r" of the whole test was at 0.88, which was described as "high correlation," it would mean that the 30-item research instrument was enough and was in its final form and was ready to be administered. (see Appendix N).

Experimental Procedure

The data utilized in this study were the scores obtained by the Grade 10 students before and after implementing the radio-based instruction. The data were gathered after eight weeks of doing the experimental study.

The researcher followed systematically the mechanics to achieve a just and fair result of the experiment. The researcher secured the permission from the Office of the School Principal to conduct the study at Danao Integrated School. The approval was carried out the letter to the concerned adviser to brief the researcher's paper. Afterward, with the teacher's assistance and by following the minimum health standard protocol, the researcher visited the subjects' houses for ocular inspection to verify the presence or existence of the transistor radios. After ensuring that all learners had their transistor radios, the researcher began the proper research by providing the teacher with the pre-test in English 10 for the 2nd quarter, which was then disseminated to all research respondents.

After a week, the researcher collected the pre-test and tracked the distribution of the learning activity sheets and the universal serial bus for their copies of the recorded audio lessons every week. Before the study, the researcher, as an RBI teacher, ensured that scripts and audio lectures were recorded. Scripts were based on the 2nd quarter of Most Essential Learning Competencies (MELC) extended by the Learning Activity Sheet. This process took place until the

last audio lesson was given to the learners. Afterward, the researcher gave the learners through the teacher the post-test, which was collected after a week, and after the collection, the researcher checked, recorded, and treated the data with the highest confidentiality.

Statistical Tools

The study used the Wilcoxon Signed-Rank Test, a non-parametric statistical hypothesis test which used to compare two related samples, matched samples, or repeated measurements on a single sample to assess whether their population means rank differed.

The researcher used the policy guidelines stipulated in DM 42, s. 2020, which stated that DepEd Memorandum No. 08, s. 2015 shall still be the basis for computing the learners' grades during the pandemic, where learners' initial grades should be transmuted into their final grades (see Appendix O). Moreover, the Department of Education's grading scale and descriptors were utilized to interpret and describe the grades of the Grade 10 learners in their English subject (see table 2).

Table 2. Mastery Percentage Level Interpretation

Grading Scale	Descriptors
90%-100%	Outstanding
85%-89%	Very Satisfactory
80%-84%	Satisfactory
75%-79%	Fairly Satisfactory
Below 75%	Did Not Meet Expectations

The mean score and standard deviation were used to describe the performance of Grade 10 students in English before and after the implementation of radio-based instruction, and a statistical tool, Wilcoxon signed-ranked test was utilized to determine the significant difference in the respondents' scores during their pre-test and post-test. Moreover, the Wilcoxon test was strongly supported by Hayes (2020), where it was detailed that this test aimed to essentially calculate the difference between the sets of pairs and analyzed these differences.

$$W = \sum_{i=1}^{N_r} \left[\text{sgn}(x_{2,i} - x_{1,i}) . Ri \right]$$

W = Test Statistics
= sample size, excluding pairs where x1 = x2
Sgn = sign function
= corresponding ranked pairs from two distributions
= rank i
The hypothesis was tested at a 0.05 level of significance.

Results and Discussions

The Post-test Results of Grade 10 English

Table 3 presents the Pre-test Scores of Grade 10 learners in English with a mean score of 15.47, and gave a performance percentage level of 52%, which was transmuted into 73%, and described as "Did Not Meet Expectations." It also depicted a pre-test score of 11 as the lowest score which was 37% performance level, and analyzed as "did not meet expectation." The highest pre-test score recorded was 23 which was interpreted as 77% performance level. However, although 77% was considered as above the required performance still considered as alarming since there was only 1 learner who got this score.
This result implied that the pre-test performance of Grade 10 learners in terms of their performance level needed intervention to improve their performance. Moreover, this result implied that learners' performances were affected by the present pandemic, which had caused the suspension of the face-to-face modality. Furthermore, it was implicated

that learners' performance was also affected by their lack of interaction with their teachers, who could provide them with proper guidance for proper learning.

Table 3. The Pre-test Scores of Grade 10 Learners in English

Student	Pre-test Scores	Performance Percentage Level	Transmuted Value
1	15	50	72
2	17	57	74
3	16	53.3	73
4	18	60	75
5	19	63.3	76
6	16	53.3	73
7	13	43.3	70
8	14	47	71
9	15	50	72
10	16	53.3	73
11	13	43.3	70
12	14	47	71
13	13	43.3	70
14	12	40	70
15	12	40	70
16	11	37	69
17	10	33.3	68
18	19	63.3	76
19	20	67	78
20	23	77	85
21	22	73.3	83
22	20	67	78
23	18	60	75
24	13	43.3	70
25	15	50	72
26	16	53.3	73
27	15	50	72
28	12	40	70
29	11	37	68
30	16	53.3	73
Mean	**15.47**	**52%**	**73%**
Description	**DID NOT MEET EXPECTATION**		

 The data presented above was supported by the study of Sintema (2020), where it was clearly stated that the learners' academic performance was likely to drop due to the reduced contact between teachers and students, which promoted a lack of consultation or guidance from the teachers when difficulties in learning and understanding occurred. This statement was strongly supported by the study of Hulu (2019), where it was found out that learners' performance improved with teachers' guidance. Thus, in the absence of the teachers' guidance, learners' performance was more likely to decrease or fail, as proven by the current study of UNICEF (2020), which found that learners failed to acquire

new skills and develop new knowledge due to a lack of formative assistance and guidance mechanisms from teachers as a result of the ongoing pandemic.

Furthermore, the study by Hulu (2019) regarding the importance of teachers' presence in terms of projecting learners' performance showed a clear path of the usefulness of the results of this study. Furthermore, as explicitly shown in the result of this study, teachers' direct absence from the delivery of the curriculum could and might result in low performance of the learners. Primary teachers' presence might sound as simple as imagined, but this aspect gravely played a role in helping learners to perform well.

The Post-test Results of Grade 10 English
Table 4 shows the Post-test Scores of the Grade 10 learners after the implementation of Radio-Based Instruction. The Grade 10 learners' Performance had increased since it was recorded that the post-test scores garnered a mean of 22.43 and a total of 75% performance level which was transmuted as 84% or Satisfactory Performance. It was also shown that the lowest post-test score was 15 recorded by only 2 learners. Meanwhile, the highest score was 28 which was almost perfect since it recorded a 98% level of performance.

Table 4. The Post-test Scores of Grade 10 Learners in English

Student	Post-test Scores	Performance Percentage Level	Transmuted Value
1	23	77	85
2	24	80	87
3	25	83.3	89
4	21	70	81
5	23	77	85
6	22	73.3	83
7	21	70	81
8	23	77	85
9	16	53.3	73
10	15	50	72
11	15	50	72
12	18	60	75
13	19	63.3	76
14	21	70	81
15	25	83.3	89
16	26	87	91
17	23	77	85
18	23	77	85
19	24	80	87
20	25	83.3	89
21	26	87	91
22	28	93.3	95
23	23	77	85
24	23	77	85
25	22	73.3	83
26	24	80	87
27	25	83.3	89

28	27	90	93
29	22	73.3	83
30	21	70	81
Mean	**22.43**	**75%**	**84%**
Description	**SATISFACTORY**		

This result implied that the Grade 10 learners' performance level increased because of the radio-based instruction given to the learners. This finding also suggested that the students could absorb the technology-based intervention. Furthermore, as Murgatrotd (2020) pointed out, this was possible since the intervention was available, affordable, and flexible for students.

Radio-based instruction deemed relevant with the study of Bubb (2020), where technological intervention was used and had affected students' learning experiences during distance learning. This positive effect has allowed the Grade 10 learners of Danao Integrated School to improve their performance in their English subject.

This positive result was in congruence with the study of Pardo-Segura (2014) in terms of its relevant findings entailing radio broadcasting as an alternative that supported the enhancement of writing and reading skills in the foreign language. Moreover, the display of improvement on the learners' performance had also shown strong applicability for radio usage in delivering the curriculum instruction.

According to Olakulehin (2016), "The Open University indicated that radio had better value for weak students who benefited from the radio as a supplementary learning aid." In the same citation, he also mentioned the study of Thukral and Ho (2009), that showed high-quality radio programs successfully expanded access and quality of distance education.

Radio was used to educate students who were not in school, who were affected by conflict, who were orphans, and who lived in countries where most social systems had collapsed or never existed—the poorest, least supported, and most isolated learners to whom access to education had traditionally been denied and working class. This method was also used in systems of large scales, like India with more than 20 million learners. This statement was further agreed by Pardo-Segura (2014) in her study conducted at Universidad Pedagógica y Tecnológica de Colombia which showed that radio broadcasting was an option that supported the development of writing and reading skills in the foreign language. Various studies had existed regarding the advantages of radio inclusion in curriculum delivery. In fact, in the study of Elliot and Lashley (2017), it was found out that learners are enthusiastic since the usability of radio in the class improved their listening skills.

The performance level of Grade 10 learners increased from Did Not Meet Expectations level to Satisfactory level, which displayed a positive change. The result was relevant to the study of Lavine and Franzel (2015), stating that Radio-Based Instruction really helped the learners.

Furthermore, the post-test result displayed strong relevance to the study of Kurrien (2016), where learners were transformed from being passive into active learners. This result simply meant that the Grade 10 learners of Danao Integrated School was directly receiving instruction from their teachers through the audio recordings guided by the radio lesson scripts. As a result of the experiment, the learners' performance improved from "Did Not Meet Expectations" to "Satisfactory." Therefore, the Radio-Based Instruction was effective.

Radio as an educational tool has impacted developing countries such as Thailand, India, Mali, Columbia, Nigeria, Mexico, Kenya, Nepal, Bangladesh, Nicaragua, Sri Lanka, Botswana, South Korea, etc. (Sarmah and Lama, 2017). Furthermore, radio progressed to various stages of development and has been employed in various of ways, according to Sarmah (2017). Radio was primarily utilized to teach mathematics to students in Thailand, India primarily for rural development, Mali for literacy instruction, Nigeria for management courses, particularly in agriculture, and Sri Lanka for family planning and health. Also, the study by Levine and Franzel (2015) adds to the benefits of radio-based education by stating that radio-based education helped students learned to write since the lack of visual imagery on radio stimulated them to think about making stories with only words.

However, in some instances like community health crises such as the Covid-19 pandemic, radio-based instruction was implemented or practiced with a facilitator. According to one study, the facilitator's assistance is key to assuring student engagement with the radio broadcast, and students who did not have access to a trusted adult or study group, particularly during the Ebola outbreak, did not benefit from radio instruction (Plan International, 2016). As a result, this research project was started in which students worked independently at home using radio-based training without the help of an instructor or teacher.

The Effectiveness of Radio-Based Instruction

Table 5. Test of Differences between the Pre-test and Post-test Scores of the Subjects

10th Grader	Mean	Mean Difference (Pre-Post)	W-Value	W-Critical	Decision
Pre-test	15.47	-6.96	.000	126	Reject H_0
Post-test	22.43				

Wilcoxon Signed Ranked Test yielded a w-value of 0.00, less than 0.05, thus rejecting the null hypothesis. Therefore, there is a significant difference between learners' proficiency from the pre-test to the post-test in English 10.

This result implied that learners, though with the absence of their teachers, could still learn using the radio-based instruction as a medium to channel their teachers' instructions. Also, this implies that a flexible, acceptable, and affordable technology-based innovation to deliver the curriculum instruction was possible for the Grade 10 learners of Danao Integrated School.

The use of radio-based instruction in English 10 was effectively based on the learners' post-test results. This result strongly displayed relevance with the study of the United States Agency for International Development (2007) that found technology-based intervention, if managed properly, could improve learners' performance. Furthermore, this result was similar to the study conducted by Valdez, Paulican and Adriatico (2015). It was found out that radio-based instruction was very effective in teaching. The use of it was to channel information from the teacher relevant to the lesson given and included in the Learning Activity Sheet which was made it possible for the learners to comprehend the lessons. Thus, the improvement in the learners' performances as attested by the post-test scores indicated a grave relevance to the theoretical framework of this study, where listening to radio lessons denoted active participation of the learners since it allowed them to construct knowledge rather than just simply listening to it. Moreover, listening to the radio lessons allowed the learners to apply their learning in answering academic exercises.

Conclusion

The following conclusions were drawn based on the findings:

1. The pre-test scores for Grade 10 in English were at the performance level of "Did not meet Expectations".
2. It was found that learners' performance in Grade 10 English using the Radio-Based Instruction had improved from "Did not meet Expectations" to a "Satisfactory performance Level."
3. The study determined a significant difference between the pre-test and post-test mean scores of the Grade 10 learners in their English subject with Radio-Based Instruction in English as a technology-based intervention. The result proved that Radio-Based Instruction (RBI) effectively improved the academic performance of learners in English 10.

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