

Radio-Based Instruction as a Support Modality: Its Effect on Pupils' Academic Performance During Distance Learning

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Abstract— Due to the threat of COVID-19, the Education Department created ways to ensure that learning continues. One is modular distance learning, but children found difficulty accomplishing tasks on the self-learning modules. Thus, radio-based instruction was implemented as a support modality. This quantitative study focused on assessing the relationship between the radio-based instruction implementation as a support modality to modular distance learning and the academic performance of the pupils. This study employed a descriptive-correlational research design and involved 179 pupils from all grade levels of Bonobono Elementary School. They were selected using a stratified sampling technique. In collecting the required data, researchers-made questionnaires were personally administered. Descriptive and inferential statistics were utilized in interpreting and analyzing the data. The learners' academic performance before implementing the radio-based instruction was significantly different from the academic performance after implementing RBI. Results further show that the level of effectiveness of implementing radio-based instruction as a support modality is effective as perceived by the learners. The learners' perceptions of the effectiveness of the radio-based instruction implementation are significantly affected by the learners' number of siblings. However, the learners' academic performance is not significantly affected by the learners' perceptions of the effectiveness of radio-based instruction as a support modality.

Keywords— Academic performance, distance learning, radio-based instruction.

I. INTRODUCTION

COVID-19 has affected every aspect of human activity in the Philippines and worldwide. One of those affected is the education of the students. The Department of Education has created ways to address the problem. Since face-to-face is impossible, one solution is to provide modules to continue the students' learning with the parents' help.

The same happens in every school in our country as many parents complain about how they can teach their children using modules. Some are illiterate, and others are busy earning a living to meet their family's needs. They do not have time to guide their children in answering the modules.

Individualization of instructions is the need of time. Effective learning requires individual guidance, personal attention, and overall individual efforts of the learners. The Self Learning Modules may benefit the students due to their

enriched features by performing the role of an efficient teacher and, in the case of the students, by becoming independent thinkers, which will help them gain the freedom to learn without restrictions.

According to the parents, the children have difficulty answering the modules because there are so many activities to be answered, and it is difficult for them to understand without guiding them. Most students cannot access the internet to search for topics they do not understand. Bataraza District 1 has created a way to educate students further to address the problems encountered.

Due to increased enrolment of students and knowledge explosion, the need for Self-Learning Modules is the demand of the time. To develop and determine the effectiveness of Self Learning Modules (SLM) for higher education, the present venture has been taken up. The students may excel in their related fields if provided Self Learning Modules for self-study.

Aside from using modules, it will also use Radio-based Instruction to teach students. In Radio-based Instruction, children can directly hear their teacher teach and explain the lessons step by step, and as they listen, they follow their teacher using handouts and worksheets. They can also ask their teacher for clarification by texting or calling.

The study aims to describe the learners' academic performance during modular distance learning and assess the effectiveness of Radio-based Instruction as a support modality as perceived by the learners. If the research proves that the Self-Learning and Radio-based Instruction as a learning modality can help raise the academic performance of students, it can be recommended to other schools that have not yet used this method of teaching and, if not, still need to use or discover other teaching methods to educate students better.

Self-Learning Modules (SLMs) are distributed to parents every Friday. The answered modules will be retrieved on the same day of the distribution of SLMs. Radio-Based Instruction is different from answering in Self-Learning Modules. Pupils must listen to 89.1 Radyo Eskuwela of Bataraza District 1 from Monday to Friday. Teachers from other schools in Bataraza District 1 record the audio to play on air. Worksheets and handouts are distributed every Friday at Bonobono Elementary School.

Radio-Based Instruction (RBI) is an alternative learning delivery modality that utilizes a radio broadcast to air lessons in the absence of actual face-to-face teaching. It is a means of providing access to education to students living in remote areas and those who have no access to the internet (MacMurdie, 2022).

The radio-based literacy program can produce important educational outcomes and can make significant impacts on family literacy skills and practices, provided that a strong support component among the learners, parents and teachers occurs. It is also implied that radio programs can be an effective tool of social transformation to help empower communities and families as they work to aid their children in accomplishing learning tasks (Acido, Muega, and Oyzon, 2013).

There is a need for instructional radio to be used in teaching, which can also be used to supplement, clarify, vitalize, emphasize, instruct, and enhance learning in transmitting knowledge, ideas, skills, and attitude. The lecturers' ability to use instructional Radio improves students' academic achievement (Olakulehin, 2016).

In a study in Bataraza, Palawan, it was found that both pupils and parents understand the effectiveness of radio-based instruction as extremely effective. It was also noted that there is a significant relationship between how pupils and parents understand the RBI effectiveness (Yayen and Marensil, 2021).

Through the interactive radio instruction, the pupils' achievement in literacy and life skills is affected positively as compared to those who were not subjected to IRI. More so, setting up a radio station for educational purposes is effective in terms of access, cheapness, and reach (Ugochukwu and Ezeah, 2020).

The results showed learners who were utilizing radio-based instruction had the same high level of perception in terms of objectives, content, learning activities, and assessments. It was also concluded that RBI is successful in attaining its purpose of ensuring academic growth despite the pandemic (Ablir, 2022).

Research Questions

This study aims to describe the learners' academic performance during the modular distance learning and assess the effectiveness of Radio-based Instruction as a support modality as perceived by the learners of BonoBono Elementary School as a basis for a school plan of action.

Specifically, it seeks answers to the following questions:

1. What describes the demographic profile of the learners as:
 - 1.1 Age;
 - 1.2 Gender;
 - 1.3 Parent's economic status;
 - 1.4 Parent's educational attainment; and
 - 1.5 The number of siblings?
2. What is the learners' academic performance in modular distance learning before implementing Radio-Based Instruction as a support modality?
3. What is the learners' academic performance in modular distance learning after implementing Radio-Based Instruction as a support modality?

4. Is there a significant difference between the learners' academic performance before and after implementing the radio-based instruction as a support modality?
5. What is the level of effectiveness of radio-based instruction as a support modality as perceived by the learners?
6. Is there a significant relationship between:
 - 6.1 the learners' profile and their academic performance;
 - 6.2 the learners' profile and their perceptions towards the effectiveness of Radio-Based Instruction; and
 - 6.3 the learners' academic performance after implementing the Radio-Based Instruction and its perceived effectiveness?

Hypotheses

1. There is no significant difference between the learners' academic performance before and after implementing the radio-based instruction.
2. There is no significant relationship between the learners' profile and academic performance.
3. There is no significant relationship between the learners' profile and their perceptions of the effectiveness of Radio-Based Instruction.
4. There is no significant relationship between the learners' academic performance after implementing the Radio-Based Instruction and its perceived effectiveness.

II. METHODOLOGY

A. Research Design

This study adopted the descriptive-correlational approach in finding the relationship between the academic performance of the learners and the implementation of radio-based instruction as a support modality. This study described the learners' profile and academic performance before and after the implementation of the radio-based instruction as a support modality.

B. Sampling

The population of this study included the learners of Bonobono Elementary School from grades 1 to 6. Using the Raosoft sample size calculator, a sample size of 179 was obtained. Stratified random sampling was utilized in this study.

C. Data Collection

Data were collected from the respondents using a researcher-made questionnaire. In testing the reliability and validity of the questionnaire, it was subjected to Chronbach's alpha and validated by the field's pool of experts. Before the distribution of the questionnaire, the researchers secured informed consent from the parents of the respondents as well as informed assent. It was distributed during the distribution and retrieval of self-learning modules as negotiated between the researchers and the respondents' class advisers. The respondents were assured of the confidentiality of the answers and were informed that they could withdraw from their participation at any time.

D. Data Analysis

In analyzing gathered data, descriptive and inferential statistics were employed. Weighted mean, frequency counts, and percentages were utilized to describe the profile of the learners. Mean was used to identify the level of academic performance of the students. T-Test was utilized to compute the difference between the learners' academic performance before and after implementing the radio-based instruction. Pearson correlation was employed to test the degree of relationship between the said variables.

III. RESULTS

Profile of the Learners

In Table 1, the profile of the learners is presented. In terms of age, almost half of the learners, or 45.81%, were 10 years and older ($f = 82$). In terms of gender, more than half of the learners, or 55.87%, were males ($f = 100$). In terms of parents' economic status, the majority of the learners, or 45.81%, had parents who had income from Php 1,001 to Php 5,000 ($f = 82$). In terms of parents' educational attainment, most learners, or 32.96%, had parents who attained high school ($f = 59$). In terms of the number of siblings, the majority of the learners, or 41.90%, had two siblings ($f = 75$).

TABLE 1. Profile of the Learners in terms of Age, Gender, Parents' Economic Status, Parents' Educational Attainment, and Number of Siblings

	<i>f</i>	%
Age		
• 7	35	19.55
• 8	30	16.76
• 9	32	17.88
• 10 and above	82	45.81
Total	179	100.00
Gender		
• Male	100	55.87
• Female	79	44.13
Total	179	100.00
Parents' Economic Status		
• Php 1,000 and below	3	1.68
• Php 1,001 – Php 5,000	82	45.81
• Php 5,001 – Php 10,000	77	43.02
• Php 10,001 – Php 15,000	6	3.35
• Php 15,001 and above	11	6.15
Total	179	100.00
Parents' Educational Attainment		
• Elementary Level	23	12.85
• Elementary Graduate	20	11.17
• High School Level	59	32.96
• High School Graduate	25	13.97
• College Level	18	10.06
• College Graduate	34	18.99
Total	179	100.00
Number of Siblings		
• 1	44	24.58
• 2	75	41.90
• 3	41	22.91
• 4	12	6.70
• 5 and above	7	3.91
Total	179	100.00

Academic Performance Before Implementing the Radio-Based Instruction

The academic performance of the learners before the implementation of the radio-based instruction is indicated in Table 2. Almost half of the learners or 45.81%, had a satisfactory performance ($f = 82$).

TABLE 2. Academic Performance Before Implementing the Radio-Based Instruction

Grading Scale	<i>f</i>	%	Descriptors
90 – 100	9	5.03	Outstanding
85 – 89	62	34.64	Very Satisfactory
80 – 84	82	45.81	Satisfactory
75 – 79	26	14.53	Fairly Satisfactory
Total	179	100.00	

Academic Performance After Implementing the Radio-Based Instruction

In Table 3, the academic performance of the learners after the implementation of the radio-based instruction. The majority of the learners, or 43.58%, had a satisfactory performance ($f = 78$).

TABLE 3. Academic Performance After the Implementation of Radio-Based Instruction

Grading Scale	<i>f</i>	%	Descriptors
90 – 100	1	0.56	Outstanding
85 – 89	55	30.73	Very Satisfactory
80 – 84	78	43.58	Satisfactory
75 – 79	45	25.14	Fairly Satisfactory
Total	179	100.00	

Academic Performance Before and After Implementing the Radio-Based Instruction

Shown in Table 4 is the difference between the learners' academic performance before and after implementing the radio-based instruction. The academic performance of the learners before implementing the radio-based instruction ($M = 2.702$, $SD = 0.778$) was significantly different than the academic performance after implementing RBI ($M = 2.933$, $SD = 0.761$), $t(179) = -2.831$, $p = 0.005$.

TABLE 4. Difference between the Academic Performance of the Learners Before and After the Implementation of Radio-Based Instruction

	Before Implementing RBI		After Implementing RBI		df	t	p
	M	SD	M	SD			
Academic Performance	2.702	0.778	2.933	0.761	178	-2.831	0.005

Effectiveness of Radio-Based Instruction as Perceived by the Learners

The perceptions of the learners toward the effectiveness of radio-based instruction are shown in Table 5. It can be gleaned that the learners strongly agreed with nine out of 10 indicators with the statements “We have radio/ cell phone with radio application at home” and “The reception of radio in our community is clear,” obtaining the highest weighted mean of 4.00. However, the learners agreed that they had a chance to

interact with the lessons on the radio with a weighted mean of 3.22.

Results further reveal that the level of effectiveness of implementing radio-based instruction as a support modality is effective as perceived by the learners, as shown by its overall mean of 3.90.

TABLE 5. Effectiveness of Radio-Based Instruction as Perceived by the Learners

Statements	Weighted Mean	Std. dev.	Adjectival Rating
1. We have radio/cell phone with radio application at home.	4.00	0.5205	Strongly Agree
2. I know how to tune in to our school radio frequency.	3.67	0.5655	Strongly Agree
3. I learn my lessons through school radio.	3.89	0.5522	Strongly Agree
4. I listen my lessons on radio on time.	3.56	0.6556	Strongly Agree
5. The instructions for my lessons on the radio are clear and understandable.	3.78	0.6141	Strongly Agree
6. The reception of radio in our community is clear.	4.00	0.6069	Strongly Agree
7. I have a chance to interact with the lessons in radio	3.22	0.6496	Agree
8. Radio lessons/ audio lessons help me to answer the questions in my modules.	4.00	0.5243	Strongly Agree
9. I understand my lesson better on my module while listening on audio lesson on school radio.	3.89	0.5576	Strongly Agree
10. I am entertained by audio lessons on radio.	3.67	0.6128	Strongly Agree
Overall Mean	3.90		Effective

Learners' Profile and Academic Performance

In Table 6, the relationship between the profile of the learners and their academic performance is presented. Using the Pearson r correlation coefficient, it was found that a statistically significant negligible positive correlation exists between the learners' profile in terms of age and their academic performance after implementing the radio-based instruction ($r = 0.163$; $p < 0.05$).

On the contrary, there is no significant relationship between the profile of the learners in terms of gender, parents' economic status, number of siblings, and parents' educational attainment and their academic performance after the implementation of the radio-based instruction.

TABLE 6. Relationship between the Learners' Profile and their Academic Performance

Variables	Academic Performance after the Implementation of Radio-Based Instruction		Interpretation
	Pearson's r	p-value	
Age	0.163	0.029	Significant
Gender	0.078	0.296	Insignificant
Parents' Economic Status	0.035	0.646	Insignificant
Number of Siblings	-0.066	0.377	Insignificant
Parents' Educational Attainment	-0.533	0.477	Insignificant

Learners' Profile and Effectiveness of Radio-Based Instruction

The relationship between the learners' profile and their perceptions of the effectiveness of the radio-based instruction is revealed in Table 7. Using the Pearson r correlation coefficient, it was established that a statistically significant negligible negative correlation exists between the learners' profile in terms of the number of siblings and their perceptions of the effectiveness of the radio-based instruction ($r = -0.152$; $p < 0.05$).

On the other hand, no statistically significant correlation exists between the learners' profile in terms of age, gender, parents' economic status, educational attainment, and the effectiveness of radio-based instruction as perceived by the learners.

TABLE 7. Relationship between the Learners' Profile and their Perceptions towards the Effectiveness of Radio-Based Instruction

Variables	Effectiveness of Radio-Based Instruction as Perceived by the Learners		Interpretation
	Pearson's r	p-value	
Age	0.059	0.430	Insignificant
Gender	0.057	0.445	Insignificant
Parents' Economic Status	-0.039	0.604	Insignificant
Number of Siblings	-0.152	0.043	Significant
Parents' Educational Attainment	-0.054	0.475	Insignificant

Academic Performance and Effectiveness of Radio-Based Instruction

In Table 8, the relationship between the learners' academic performance after implementing the radio-based instruction and their perceptions of the effectiveness of the radio-based instruction is shown. Using the Pearson r correlation coefficient, it was observed that there was no statistically significant correlation between the academic performance of the learners and the effectiveness of the radio-based instruction as perceived by the learners.

TABLE 8. Relationship between the Learners' Academic Performance after the Implementation of the Radio-Based Instruction and its Perceived Effectiveness

Variables	Effectiveness of Radio-Based Instruction as Perceived by the Learners		Interpretation
	Pearson's r	p-value	
Academic Performance after the Implementation of Radio-Based Instruction	-0.097	0.475	Insignificant

IV. CONCLUSIONS

Based on the analysis and interpretation of the collected data, the study concluded that before and after the implementation of radio-based instruction as a support modality, the majority of the learners had a satisfactory performance. More so, the academic performance of the learners before implementing the radio-based instruction was significantly different from the academic performance after implementing RBI. Consequently, the level of effectiveness of

implementing radio-based instruction as a support modality is effective as perceived by the learners. Furthermore, a statistically significant negligible positive correlation exists between the profile of the learners in terms of age and their academic performance after implementing the radio-based instruction. Also, a statistically significant negligible negative correlation exists between the learners' profile in terms of the number of siblings and their perceptions of the effectiveness of the radio-based instruction. Lastly, no statistically significant correlation between the academic performance of the learners and the effectiveness of the radio-based instruction as perceived by the learners.

V. RECOMMENDATIONS

Based on the conclusions of this study, it was recommended that since radio-based instruction was perceived by the pupils to be effective as a support modality, sustain the existing practices being done by the teachers and the Bonobono Elementary School community. Similarly, reinforce the current strategies employed by the teachers in conducting radio-based instruction to achieve a very effective level as perceived by the learners. Also, since the learners' age significantly affects their academic performance in the implementation of radio-based instruction, the teachers who are holding radio-based lessons must consider this variable. It can also be taken into account that radio-based instruction as a support modality should be implemented only in higher grade levels, such as grades 4 to 6 because age is seen to be one of the factors affecting the learners' academic performance in the

conduct of radio-based instruction.

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REFERENCES

- [1] N. MacMurdie, "Radio-based instruction transforms education for children in the Philippines," *Global Peace Foundation*, 6 February 2022, <https://www.globalpeace.org/news/radio-based-instruction-transforms-education-children-philippines>
- [2] M. B. Acido, M. G. Muega, and M. L. Oyzon, "Elements of a radio-based literacy program: towards community-responsive pre-service teacher education," *Asian Journal of Social Sciences & Humanities*, vol. 2, no. 1, 196-201, 2013.
- [3] F. K. Olakulehin, "Impact of instructional radio delivery mode on academic achievement of distance learning students in computer science," *US-China Education Review B*, vol. 6, no. 12, 688-698, 2016.
- [4] M. D. Yayen and F. T. Marensil, "Learning thru radio: the effectiveness of radio-based instruction 9RBI) to grade 6 pupils and parents of barangkas elementary school," *European Journal of Humanities and Educational Advancements*, vol. 12, no. 10, 157-165, 2021.
- [5] I. F. Ugochukwu and G. H. Ezeah, "Impact of interactive radio instruction (IRI) on achievement in literacy and life skills among primary one nomadic pupil in north-west Nigeria," *Journal of Critical Reviews*, vol. 7, no. 19, 10150-10161, 2020.
- [6] I. A. Ablir, "Radio-based instruction: a modular distance learning teacher supplementary material," *International Journal of Research Publications*, vol. 102, no. 1, 449-484, 2022.