

The Effectiveness of the Podcast Lessons in Teaching Science in Grade 5 in Labo East District, Division of Camarines Norte

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ABSTRACT

The integration of technology into education has significantly transformed teaching and learning processes. This study determined the effectiveness of the podcast lessons in teaching Science in Grade 5 in Labo East District, Division of Camarines Norte for School Year 2024-2025. The respondents of the study were composed of forty-two (42) Science teachers from twenty-one (21) public elementary schools. The study employed a descriptive-evaluative-correlational research design with a researcher-made questionnaire as the primary instrument to gather the necessary data. Data were analyzed using weighted mean, ranking, and Kendall's Coefficient of Concordance W with, chi-square at 0.05 level of significance. Findings revealed that the utilization of podcast lessons was Very Much Utilized across supporting diverse learning styles, flexible learning, independent learning, and access to expert knowledge. Moreover, podcast lessons were Very Much Effective in terms of active participation, time spent on listening, interest and motivation, and interaction with supplemental activities. There was no significant agreement in most rank orders except for time spent on listening. Despite high effectiveness, differences in perceptions and implementation were noted; thus, policy recommendations were formulated to enhance integration and address the identified gaps.

1. Introduction

The integration of technology into education has significantly transformed teaching and learning processes. One of the emerging technological tools gaining attention in recent years is podcasts, which offer an innovative approach to delivering lessons. Podcasts, typically audio-based content, allow learners to engage with material in a flexible and accessible manner. In the context of teaching science to Grade 5 learners, podcasts can provide an alternative to traditional classroom methods by offering engaging, multimedia-rich content that can be accessed anytime, anywhere.

Many literatures underscore the expanding significance of podcasts and other technological tools in enhancing science education and overall academic performance. Studies revealed that podcasts as supplementary learning tools in teaching science concepts enhance learners' conceptual understanding, develop better problem-solving and critical thinking skills, foster active engagement, improve motivation, retention, and academic outcomes, accessibility, dynamic and flexible learning experience, and autonomy in learning process by allowing students to access lesson contents at their own pace and through auditory means (Aguinaldo & Cagampang, 2023; Alvarez & Ramos, 2021; Cordero & Rivera, 2023; Dela Cruz & Ocampo, 2022; Garcia, 2020; Javier et al., 2022; Santos & Garcia, 2020; Villanueva, 2021).

These findings are consistent with the study of Beyessa (2015) emphasizing that the integration of technology and innovative teaching strategies are significant contribution and significantly influences student's academic achievement in Science. Moreover, the results of related studies in other subject areas revealed that the use of ICT tools, mobile applications, learning tasks, and external support from parents positively contribute to improved student engagement, retention, and academic performance (Amponsah et al., 2017; Avila, 2016; Bonney et al., 2015; Omwono, 2015; Pechenkina et al., 2017).

In general, the aforementioned studies highlight the importance of adopting flexible, integrating technology-driven, and learner-centered approaches in education. However, despite the number of documented benefits, the effectiveness of podcasts as instructional tools remains underexplored. Thus, this study aims to explore the effectiveness of podcast lessons in teaching science to Grade 5 learners, focusing on student engagement, comprehension, and overall learning outcomes. By evaluating the impact of podcast lessons, this research seeks to contribute valuable insights into how technology, specifically podcasts, can enhance the science learning experience in elementary education.

2. Objectives of the Study

Primarily, this study was conducted to determine the effectiveness of the podcast lessons in teaching Science in Grade 5 in Labo East District, Division of Camarines Norte for School Year 2024-2025. Specifically, the researcher intended to determine (1) the Extent of the Utilization of Podcast Lessons in Teaching Science 5 in terms of: (a) Supporting Diverse Learning Styles, (b) Flexible Learning, (c) Promoting Independent Learning, and (d) Access to Expert Knowledge; (2) the Significance of the

Agreement on the Rank Orders of the Extent of the Utilization of Podcast Lessons among Respondents; (3) the Extent of the Effectiveness of Podcast Lessons in Teaching Science 5 in terms of: (a) Active Participation, (b) Time Spent on Listening, (c) Interest and Motivation, and (d) Interaction with Supplemental Activities; (4) the Significance of the Agreement on the Rank Orders of the Extent of the Effectiveness of Podcast Lessons among the Different Groups of Respondents; and (5) the Policy Recommendations that may be formulated based on the findings of the study.

3. Materials and Methods

The descriptive-evaluative-correlational research design was employed. The correlational method describes the different aspects of a situation to obtain knowledge, or picture of the nature, status of, or development of such activities. This study was used to determine the effectiveness of podcast lessons in teaching Science in Grade 5 in Labo East District, Division of Camarines Norte for School Year 2024-2025.

3.1 Respondents

The respondents consisted of forty-two (42) Grade 5 Science teachers from twenty-one (21) public elementary schools in Labo East District, Division of Camarines Norte. These respondents were taken for the School Year 2024-2025.

3.2 Data Gathering Instrument

The instrument used in gathering the necessary data was a structured researcher-made questionnaire checklist. Part I contained the indicators on the extent of utilization of podcast lessons in teaching Science 5 in terms of supporting diverse learning styles, flexible learning, promoting independent learning, access to expert knowledge, and Part II contained the indicators on the extent of effectiveness of podcast lessons in teaching Science 5 in terms of active participation, time spent on listening, interest and motivation, and interaction with supplemental activities. A total of 80 questions were included in this study. The research instrument underwent content validation by experts in the field and was proofread for clarity and grammatical accuracy. The reliability of the instrument was tested after validation, yielding a coefficient of 0.68 with a t- value of 7.80, indicating that the instrument acceptable. Suggestions and recommendations from validators were incorporated for the improvement of the instrument.

3.3 Data Analysis

Weighted mean was used to determine the extent of utilization of podcast lessons in teaching Science 5 and the extent of effectiveness of podcast lessons in teaching Science 5. It was interpreted using the following scale:

Scale	Weights Assigned	Description
		Extent of the Utilization of Podcast Lessons in Teaching Science 5
5	4.50-5.00	Very Much Utilized (VMU)
4	3.50-4.49	Much Utilized (MU)
3	2.50-3.49	Utilized (U)
2	1.50-2.49	Fairly Utilized (FU)
1	1.00-1.49	Not At All (NA)
		Extent of the Effectiveness of Podcast Lessons in Teaching Science 5
		Very Much Effective (VME)
		Much Effective (ME)
		Effective (E)
		Fairly Effective (FE)
		Not At All (NA)

A letter of permission to conduct the study was sent to the Schools Division Superintendent of Camarines Norte, Public Schools District Supervisor, and School Heads of Labo East District public elementary schools for their approval and endorsements.

4. Results and Discussion

4.1 The Summary of Extent of the Utilization of Podcast Lessons in Teaching Science 5

The summary of the extent of the utilization of the podcast lessons in teaching Science 5 along is shown in Table 7.

The following areas ranked in descending order, were: Flexible Learning, 4.64; Promotes Independent Learning, 4.64; Access to Expert Knowledge, 4.59; Supporting Diverse Learning Styles, 4.55 were all rated as Very Much Utilized.

The average weighted mean the extent of the utilization of the podcast lessons in teaching Science 5 in Labo East District was 4.60 or Very Much Utilized.

The exceptionally high average weighted mean of 4.60 (categorized as Very Much Utilized) for podcast integration in Science 5 instruction across Labo East District schools represents a significant advancement in modern science pedagogy. This robust adoption rate indicates that podcast lessons have transitioned from being supplementary materials to becoming fundamental components of the science curriculum. The findings align seamlessly with Johnson and Ayers(2016), whose research demonstrated that discipline-specific podcasts serve as powerful vehicles for delivering expert scientific knowledge directly to classrooms, particularly valuable in districts where access to specialized instructors may be limited. This connection is further strengthened by Krajcik and Czerniak (2018), who emphasized how digital learning tools effectively democratize science

education by breaking down traditional barriers to quality instruction. The district's successful implementation echoes the outcomes observed by Pegrum, Bartle and Longnecker (2014), whose controlled studies revealed that podcast-based learning promotes deeper cognitive engagement and knowledge retention compared to traditional lecture methods, particularly when students can control the pace and repetition of content delivery.

The compelling evidence of podcast effectiveness in Labo East District necessitates a comprehensive, multi-stakeholder approach to sustain and expand these gains. At the practitioner level, school administrators should prioritize professional development initiatives that build educators' capacity for podcast integration.

On the policy level, education authorities must address infrastructure gaps to ensure equitable access to podcast resources across all schools, particularly in rural or underserved areas of the district. This includes reliable internet connectivity, audio playback devices, and quiet listening spaces. Curriculum specialists should collaborate with local scientific institutions to develop customized podcast repositories, an approach supported by Yonas, Sleeth and Cotner (2020) research on the motivational impact of connecting students with diverse scientific role models. The district might also explore student-created podcast initiatives, building on Frisch, Cone and Callahan (2017) evidence that podcast production develops valuable STEM communication skills while reinforcing content mastery. To validate and refine these approaches, the district should implement longitudinal studies tracking both quantitative metrics (standardized test scores, STEM enrollment rates) and qualitative outcomes (student engagement, scientific literacy).

Table 7. The Summary of the Extent of the Utilization of the Podcast Lessons in Teaching Science 5

Indicators	Average		
	Mean	Int	Rank
1. Supporting Diverse Learning Styles	4.55	VMU	4
2. Flexible Learning	4.64	VMU	1.5
3. Promotes Independent Learning	4.64	VMU	1.5
4. Access to Expert Knowledge	4.59	VMU	3
Average	4.60	VMU	

4.2 The Test of Significant Agreement on the Rank Orders of the Extent of the Utilization of the Podcast Lessons in Teaching Science 5

The results of the test of significant agreement on the rank orders of the Extent of the Utilization of the Podcast Lessons in Teaching Science 5 are described in Table 8.

Table 8. Test of significant agreement on the rank orders of the extent of the utilization of the podcast lessons in teaching science 5

Indicators	Computed		Tabular		Significance
	W	X ²	X ²	Decision on H ₀	
1. Supporting Diverse Learning Styles	0.18	4.86	16.92	Accepted	Not Significant
2. Flexible Learning	0.20	6	18.31	Accepted	Not Significant
3. Promotes Independent Learning	0.25	6.75	16.92	Accepted	Not Significant
4. Access to Expert Knowledge	0.15	4.05	16.92	Accepted	Not Significant
Average	0.19				

Table 8 reflects the data on the computed W, computed Chi-Square, significance of agreement, and the decision on the null hypothesis. Findings indicate that the Coefficient of Concordance W and the computed chi-square on the utilization of the podcast lessons in teaching Science 5 were: Supporting Diverse Learning Styles, 0.18 and 4.86(p>0.05); Flexible Learning, 0.20 and 6 (p>0.05); Promotes Independent Learning, 0.25 and 6.75(p>0.05); and lastly, Access to Expert Knowledge, 0.15 and 4.05(p>0.05).

The data show that the computed chi-square, all indicators failed exceed the tabular chi-square value at the level of significance of 0.05. Thus, the null hypothesis was accepted on the extent of the utilization of the podcast lessons in teaching Science 5 along Supporting Diverse Learning Styles, Flexible Learning, Promotes Independent Learning, and Access to Expert Knowledge. Therefore, there is no significant agreement on the extent of the utilization of the podcast lessons in teaching Science 5 along the aforementioned aspects.

The statistical findings, which show that all computed chi-square values failed to exceed the critical value at the 0.05 significance level, indicate there is no significant consensus among respondents regarding the extent of podcast utilization in teaching Science 5 across the four measured dimensions. This lack of agreement implies variability in how educators perceive and implement podcast lessons, despite theoretical benefits documented in literature. This suggests the need for standardized professional development to ensure more consistent podcast implementation. School administrators should develop clear guidelines for podcast integration across all four dimensions (diverse learning styles, flexible learning, independent learning, and expert knowledge

access) to reduce variability in utilization. The findings also indicate that simply providing podcast resources is insufficient - educators may need demonstrated examples of effective podcast use in elementary science contexts.

Al-Abdali and Al-Balushi (2015) found similar disparities when examining innovative teaching methods, noting that implementation often varies based on teacher confidence and training. The current results partially align with Greish, Nehayan and Hendawy (2017), who demonstrated podcast effectiveness in chemistry education, but only when combined with flipped classroom approaches - suggesting that standalone podcast use without complementary pedagogical strategies may lead to inconsistent implementation. Russell and Martin (2015) emphasize that science teaching methods often face adoption challenges due to varying interpretations of their utility, which may explain the non-uniform podcast utilization patterns observed in this study.

4.3 The Summary of the Extent of the Effectiveness of the Podcast Lessons in Teaching Science 5

Table 14 present the summary of the extent of the effectiveness of the podcast lessons in teaching Science 5 in terms of Active Participation, Time Spent on Listening, Interest and Motivation and Interaction with Supplemental Activities. As presented, among the four areas: Interest and Motivation ranked first with 4.67 mean and interpreted as Very Much Effective. This was followed by: Time Spent on Listening, 4.65; Active Participation, 4.64; and Interaction with Supplemental Activities, 4.60, all rated as Very Much Effective. The average weighted mean of the extent of the effectiveness of the podcast lessons in teaching Science 5 among the different types of schools in Labo East District was 4.64 or rated as Very Much Effective. The consistently high average weighted mean for podcast lessons across all school types in Labo East District implies the universal applicability and effectiveness of this instructional tool in diverse educational settings. The demonstrated effectiveness of podcasts across all school types calls for a systematic, district-wide approach to maximize their educational impact. This finding aligns with Mariano and Mina-Roguel (2025) research on science teaching effectiveness, which emphasized that digital resources can successfully complement various curricular approaches when properly implemented. The results also support Mastrokoukou et al. (2022) comprehensive framework of teaching effectiveness, particularly their finding that well-designed technological tools transcend specific school contexts to enhance learning outcomes. Importantly, the data validates Sari and Shalihah (2023) work on learning models, showing that podcast-based instruction effectively supports science process skill development regardless of school type contexts. This universal effectiveness underscores the potential of podcasts as an equitable solution for quality science instruction. The district could create a podcast-sharing platform that allows teachers from different school types to exchange successful strategies.

Table 14. The Summary of the Extent of the Effectiveness of the Podcast Lessons in Teaching Science 5

Indicators	Average		
	Mean	Int	Rank
1. Active Participation	4.64	VME	3
2. Time Spent on Listening	4.65	VME	2
3. Interest and Motivation	4.67	VME	1
4. Interaction with Supplemental Activities	4.60	VME	4
Average	4.64	VME	

4.4 The Test of Significant Agreement on the Rank Orders of the Extent of the Effectiveness of the Podcast Lessons in Teaching Science 5

The results of the test of significant agreement on the rank orders of the Extent of the Effectiveness of the Podcast Lessons in Teaching Science 5 are described in Table 15.

Table 15. Test of significant agreement on the rank orders of the extent of the effectiveness of the podcast lessons in teaching science 5

Indicators	Computed		Tabular		
	w	√2	X ²	Decision on H ₀	Significance
1. Active Participation	0.39	10.53	16.92	Accepted	Not Significant
2. Time Spent on Listening	0.64	17.28	16.92	Rejected	0.05
3. Interest and Motivation	0.36	10.8	18.31	Accepted	Not Significant
4. Interaction with Supplemental Activities	0.07	1.89	16.92	Accepted	Not Significant
Average	0.36				

Table 15 reflects the data on the computed W, computed Chi-Square, significance of agreement, and the decision on the null hypothesis.

Findings indicate that the Coefficient of Concordance W and the computed chi-square on the effectiveness of the podcast lessons were: Active Participation, 0.39 and 10.53(p>0.05); Time Spent on Listening, 0.64 and 17.28(p<0.05); Interest and Motivation, 0.36 and 10.8(p>0.05); Interaction with Supplemental Activities, 0.07 and 1.89(p>0.05). The data show that the computed chi-

square, two indicators exceed the tabular chi-square value at the level of significance of 0.05. Thus, the null hypothesis was accepted on the extent of the effectiveness of the podcast lessons in teaching Science 5 along Interest and Motivation, Interaction with Supplemental Activities and Active Participation while, rejected on Time Spent on Listening.

Therefore, there is no significant agreement on the extent of the effectiveness of the podcast lessons in teaching Science 5 among the different groups of respondents.

The mixed results of the chi-square analysis, where the null hypothesis was accepted for Interest and Motivation, Interaction with Supplemental Activities, and Active Participation but rejected for Time Spent on Listening imply important nuances in podcast effectiveness across different respondent groups. The findings call for differentiated implementation approaches that capitalize on podcasts' consistent strengths while addressing their variable aspects. This partial agreement aligns with Long, Gao, Yang and Chen (2021), who found that while innovative teaching methods generally enhance science achievement, their impact varies significantly based on implementation contexts and student characteristics. The accepted hypotheses regarding motivational and participatory benefits support Ibrahim and Hindi (2024) findings about the consistent effectiveness of engaging instructional strategies in elementary science, suggesting podcasts successfully tap into fundamental learning drivers. However, the rejected hypotheses concerning time efficiency echoes Guo and Huang (2023) caution that technology-based interventions often yield uneven results depending on home environments and individual learning habits.

5. The Policy Recommendations

Based on the findings of the study, several key policy recommendations are proposed to enhance the utilization and effective integration of podcast lessons in teaching Science 5.

- The DepEd curriculum developers and science supervisors should integrate podcast-based learning into the Science 5 curriculum to support diverse learning styles through auditory engagement.
- The science content developers and DepEd media units should collaborate with science experts to produce high-quality, standards-aligned podcast episodes for classroom use.
- The school heads and division technology coordinators should ensure that podcast lessons are accessible to learners across various devices and formats, including offline options.
- The DepEd training division and school heads should organize capacity-building sessions for teachers on integrating podcasts into science instruction effectively.
- The DepEd quality assurance teams should monitor the consistency and effectiveness of podcast usage across schools to ensure learning outcomes are met.

6. Conclusion and Recommendation

The following conclusions are drawn: the extent of the utilization of the podcast lessons in teaching Science 5 is Very Much Utilized; there is no significant agreement on the ranking order of extent of the utilization of the podcast lessons in teaching Science 5; the extent of the effectiveness of the podcast lessons in teaching Science 5 is Very Much Effective; there is no significant agreement on the ranking order of extent of the effectiveness of the podcast lessons in teaching Science 5 except on Time Spent on Listening; the policy recommendations are formulated based from the findings of the study.

Based on the findings and conclusions, the following recommendations were offered: the DepEd curriculum planners and science coordinators should continue promoting the use of podcast lessons as a supplementary tool in Science 5 instruction, reinforcing their very much utilized status; the school heads and teachers should implement standard guidelines and classroom integration strategies to harmonize the use of podcast lessons, addressing the variation in their rank order of utilization; the teachers and academic coordinators should maximize the effectiveness of podcast lessons by aligning them with interactive activities and learner-centered strategies that boost comprehension and interest; the DepEd training divisions and science educators should review and standardize best practices in implementing podcast-based learning, especially for indicators that lacked significant agreement, to ensure consistent effectiveness and; the policy recommendations be adopted.

Future researchers are advised to explore podcast use in other grade levels or subjects; compare podcast lessons with other digital formats; study long-term effects of podcast learning on performance; investigate learner and parent engagement with podcasts and; develop tools to assess podcast content effectiveness.

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