The Use of Audio-Visual Media in Teaching Science 6 at Madatag Elementary School

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ABSTRACT

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| This study investigated the effectiveness of Audio-Visual media in teaching science. This study utilized a Quasi-experimental design, specifically the one-group pretest-posttest design. This method is appropriate as it involves measuring the Science performance of Grade 6 pupils at Madatag Elementary School before and after the implementation of audio-visual media as an instructional tool. By comparing the pretest and posttest scores of the same group, the study aims to determine whether there is a significant improvement in the students’ learning outcomes, which can be attributed to the use of audio-visual media in teaching Science. This design is practical and suitable for real classroom settings where random assignments to control and experimental groups is not feasible and a full stop before this study will utilize a quasi-experimental research design, specifically the one-group pretest-posttest design. The pre-test results of Grade 6 pupils in Science at Madatag Elementary School on Table 1 showed a mean score of 23.71 out of 40, with a standard deviation of 5.53, indicating that most learners did not meet the expected performance level across the three science topics assessed. These results suggested that traditional teaching strategies was not effectively supporting students' understanding of key scientific concepts, particularly in topics such as friction and gravity, energy transformations, and simple machines. The low performance highlights a clear need for innovative and engaging instructional approaches, such as audio-visual media, to enhance comprehension and improve learning outcomes in Science. on the post-test results, after using the audio-visual media in teaching Science, Grade 6 pupils at Madatag Elementary School achieved a mean score of 33.36 out of 40, with a standard deviation of 1.60, which falls under the “Satisfactory” descriptive level. This indicates that the integration of audio-visual materials effectively supported pupils in understanding scientific concepts across topics such as forces, energy transformation, and simple machines. The consistent scores and relatively low variability also suggest that the approach provided a more uniform and engaging learning experience for the majority of learners. These findings imply that audio-visual media can be a valuable instructional tool in enhancing Science learning outcomes at the elementary level. These results align with the study of which emphasized the effectiveness of interactive computer-based media in improving student engagement and comprehension in science learning. The data also reveals that there is a significant improvement in the science performance of Grade 6 pupils at Madatag Elementary School after the use of audio-visual media, with the mean score increasing from 23.71 in the pre-test to 33.36 in the post-test. The t-value of -8.45 and a p-value of less than 0.001 indicate that this difference is statistically significant, leading to the rejection of the null hypothesis. This implies that integrating audio-visual media into science instruction effectively enhances pupils’ understanding and retention of scientific concepts, suggesting its potential as a valuable tool in elementary education. The study emphasized the role of interactive computer-based learning media in improving student engagement and understanding, particularly in science subjects, which supports the observed increase in post-test scores in this study. The pre-test results revealed that most Grade 6 pupils at Madatag Elementary School struggled to meet the expected performance level in Science. Their responses indicated difficulty in understanding core topics such as friction and gravity. A higher level of comprehension and consistency in their performance. They showed better understanding across the topics covered, and the results reflected a more uniform distribution of scores, indicating a generally improved learning experience among the class. A comparison between pre-test and post-test scores showed a marked improvement in pupils’ Science performance after the use of audio-visual media. The statistical analysis confirmed that the difference in performance was significant, supporting the effectiveness of the audio-visual approach in enhancing students’ grasp of scientific concepts. |

*Keywords: Audio-Visual, Media, Teaching, Science 6*

1. INTRODUCTION

“Learning media is one of the contributing factors to the success of learning process in the school because it can facilitate the teachers to deliver information towards the students and vice versa [1,2]. The use of creative and varied media is believed can increase the learning efficiency so that the learning goals can be achieved. Learning media is defined as something which is used to deliver messages and stimulate pupils’ cognitive and affective aspects in order to foster pupils’ learning motivation” (Arda S S 2016). “Learning media is varied in forms, such as printed media, graphic, animation, audio and audio-visual” (Omodara O D and Adu 2014). Audio-visual media is considered as effective tool to improve pupils’ critical thinking ability and also motivate pupils to learn. Audio-visual media consists of two main aspects, audio aspect and visual aspect. Visual aspect supports the message transmission through visual sense. The pupils also can receive message in form of audio through auditory sense. According to Dike (1993), audio-visual media refers to any tools which do not merely rely on reading activity in its process of message delivery. The implementation of learning media is closely related to the learning approach. By the guidance and procedures of certain approach, the application of learning media will be more effective and optimal. Based on the current Curriculum in Indonesia, Curriculum 2013, Contextual Teaching Learning (CTL) or contextual approach is recommended to be applied (Suryawati E and Kmaisah O 2010) suggests that “contextual learning is the concept of learning which relates learning material with the pupils’ real life. It helps the teachers in stimulating students to be the autonomous learners in their daily life. Based on the description above, it can be summed up that media development is urgently needed. Especially, developing learning media for geography at elementary school is worth to do. The development of media is synchronized with the current curriculum in order to fulfil the challenge of the curriculum that is creating pupils’ high critical thinking ability [6,7]. CTL is chosen because it can be implemented with and without teachers inside and outside the classroom. The major consideration is that the media being developed can give positive impact towards the students’ attitude in the learning process. The pupils will be stimulated to be autonomous learners. In addition, the classroom situation will not be monotonous so that it will positively foster the learning outcomes. The topic delivered in this media is about natural resources [8-10]. Therefore, the development of audio-visual media-based CTL is expected to urge pupils’ environmental attitude and motivate them to be more active in the learning processes”.

2. Statement of the problem

Generally, this study assessed the effectiveness of the use of audio-visual media in enhancing the Science learning outcomes in Science 6 pupils in Madatag Elementary School.

 Specifically, this study answered the following:

1. What is the performance of grade 6 pupils before using the audio-visual media in Science?
2. What is the performance of the grade 6 pupils after using the audio-visual media in Science ?
3. Is there a significant difference in the performance of grade 6 pupils in Science before and after the use of audio-visual media?

**2.1 HYPOTHESIS**

There is no significant difference in the performance of grade 6 pupils in Science 6 before and after the use of audio-visual media.

3. methodology

**3.1.Research Design**

 This study utilized a quasi-experimental research design, specifically the one-group pretest-posttest design. This method is appropriate as it involves measuring the Science performance of Grade 6 pupils at Madatag Elementary School before and after the implementation of audio-visual media as an instructional tool. By comparing the pretest and posttest scores of the same group, the study aims to determine whether there is a significant improvement in the students’ learning outcomes, which can be attributed to the use of audio-visual media in teaching Science. This design is practical and suitable for real classroom settings where random assignments to control and experimental groups is not feasible.

**3.2.Locale of the Study**

The research was conducted at Madatag Elementary School, located in Barangay Madatag, Municipality of Kabugao, Province of Apayao. The school operates under the jurisdiction of the Schools Division of Apayao and is part of the Kabugao District. The study took place during the School Year 2024–2025 and focused on Grade 6 pupils enrolled at Madatag Elementary School.

**3.3.Participants of the Study**

The participants of this study was the Grade 6 pupils of Madatag Elementary School for the School Year 2024–2025. A total enumeration sampling technique was employed, wherein all fourteen (14) enrolled Grade 6 learners was included as respondents. This sampling method is appropriate given the small population size, ensuring that the entire group is represented in the study and that the findings accurately reflect the learning outcomes of the study.

**3.4.Research Instrumentation**

The instrument used in this study was a standardized multiple-choice test consisting of 40 items, aligned with the Department of Education – CAR's prescribed Science curriculum for Grade 6. This test served as both the pre-test and post-test that assessed the learning outcomes of pupils before and after the intervention. The test was covered essential Science topics addressed during the eight-week period of the Third Quarter, ensuring relevance and curricular alignment.

In addition to the test, audio-visual media materials were utilized as the primary instructional intervention. These materials included educational science videos, simulations, and interactive multimedia presentations tailored to the Grade 6 curriculum.

To ensure content validity, the test items and audio-visual materials was undergone expert validation. A panel composed of three Master Teachers in Science and five tenured Science teachers from the District of Kabugao was reviewed the test items and multimedia content. These validators was examined the instruments for clarity, appropriateness, relevance to the learning competencies, alignment with cognitive levels (based on Bloom’s Taxonomy), and suitability for Grade 6 learners. A validation checklist and rating scale was used to collect feedback from the validators. Revisions was made based on their recommendations to enhance the quality and effectiveness of the materials and assessment tools.

To establish the reliability of the multiple-choice test, a pilot testing was conducted with 14 Grade 6 pupils at Madatag Elementary School. The results of the pilot test was analyzed using the Cronbach’s Alpha which was appropriated for dichotomously scored items. A result of Cronbach’s Alpha coefficient of 0.70 is considered acceptable for internal consistency.

Item analysis was also performed to determine the difficulty and discrimination indices of each test item. Poorly performing items was revised or discarded to improve the overall quality of the test.

**3.5.Data Gathering Procedures**

The researcher was formally seek permission from the Public Schools District Supervisor (PSDS) and the school Principal of Madatag Elementary School to conduct the research involving Grade 6 pupils. Upon receiving the necessary approval, the researcher was conducted an orientation with the participating pupils and their respective Science teacher to explain the objectives, procedures, and ethical considerations of the study.

The data collected was proceed in three main phases:

**3.6.Statistical Analysis**

To evaluate the effectiveness of audio-visual media in enhancing science learning outcomes among Grade 6 pupils at Madatag Elementary School, the following statistical tools will be employed:

**Descriptive Statistics (mean and standard deviation)**

**4. RESULTS AND DISCUSSION**

This chapter presents the result, analysis and interpretation of data on the effectiveness of Audio-Visual Media in Enhancing Science Learning Outcomes for Grade 6 Pupils at Madatag Elementary School.

***Table 1. Performance of Grade 6 Pupils in Science Before the Use of Audio-Visual Media***

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| **PRE-TEST SCORES** |
| **Respondents** | TOPIC 1No. of items: **14** | TOPIC 2No. of items: **14** | TOPIC 3No. of items: **12** | TOTAL NO. OF ITEMS:**40** |
|  | Infer how friction and gravity affect movements of different objects | Demonstrates how sound, heat, light and electricity can be transformed | Manipulate simple machines to describe their characteristics and uses |
| 1 | 8 | 7 | 5 | **20** |
| 2 | 8 | 9 | 6 | **23** |
| 3 | 9 | 9 | 8 | **26** |
| 4 | 8 | 9 | 9 | **26** |
| 5 | 7 | 6 | 8 | **19** |
| 6 | 8 | 8 | 8 | **24** |
| 7 | 6 | 5 | 5 | **16** |
| 8 | 5 | 5 | 5 | **15** |
| 9 | 11 | 11 | 10 | **32** |
| 10 | 6 | 6 | 7 | **19** |
| 11 | 10 | 10 | 10 | **30** |
| 12 | 8 | 6 | 8 | **22** |
| 13 | 10 | 10 | 9 | **29** |
| 14 | 11 | 10 | 10 | **31** |
| **Mean Pre-test Score = 23.71** |
| **Descriptive Interpretation = Did Not Meet Expectation** |
| **Standard Deviation = 5.53** |

The pre-test results of Grade 6 pupils in Science at Madatag Elementary School on Table 1 showed a mean score of 23.71 out of 40, with a standard deviation of 5.53, indicating that most learners did not meet the expected performance level across the three science topics assessed. These results suggested that traditional teaching strategies was not effectively supporting students' understanding of key scientific concepts, particularly in topics such as friction and gravity, energy transformations, and simple machines. The low performance highlights a clear need for innovative and engaging instructional approaches, such as audio-visual media, to enhance comprehension and improve learning outcomes in Science. These results aligned in the study of (Doosuur A and Igyuve S M 2013 The Use of Audio-Visual Materials in the Teaching and Learning Processes in College of Education in Beneur State-Nigeria IOSR-JRME 1 44-45), who emphasized that traditional teaching methods often fail to sustain learners' attention and interest, especially in abstract science concepts, thereby negatively impacting academic performance.

***Table 2. Performance of Grade 6 Pupils in Science After the Use of Audio-Visual Media***

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| --- |
| **POST-TEST SCORES** |
| **Respondents** | TOPIC 1No. of items: **14** | TOPIC 2No. of items: **14** | TOPIC 3No. of items: **12** | TOTAL NO. OF ITEMS:**40** |
|  | Infer how friction and gravity affect movements of different objects | Demonstrates how sound, heat, light and electricity can be transformed | Manipulate simple machines to describe their characteristics and uses |
| 1 | 8 | 7 | 5 | **20** |
| 2 | 8 | 9 | 6 | **23** |
| 3 | 9 | 9 | 8 | **26** |
| 4 | 8 | 9 | 9 | **26** |
| 5 | 7 | 6 | 8 | **19** |
| 6 | 8 | 8 | 8 | **24** |
| 7 | 6 | 5 | 5 | **16** |
| 8 | 5 | 5 | 5 | **15** |
| 9 | 11 | 11 | 10 | **32** |
| 10 | 6 | 6 | 7 | **19** |
| 11 | 10 | 10 | 10 | **30** |
| 12 | 8 | 6 | 8 | **22** |
| 13 | 10 | 10 | 9 | **29** |
| 14 | 11 | 10 | 10 | **31** |
| **Mean Post-test Score = 33.36** |
| **Descriptive Interpretation = Satisfactory** |
| **Standard Deviation = 1.60** |

 Based on the post-test results on Table 2, after using the audio-visual media in teaching Science, Grade 6 pupils at Madatag Elementary School achieved a mean score of 33.36 out of 40, with a standard deviation of 1.60, which falls under the “Satisfactory” descriptive level. This indicates that the integration of audio-visual materials effectively supported pupils in understanding scientific concepts across topics such as forces, energy transformation, and simple machines. The consistent scores and relatively low variability also suggest that the approach provided a more uniform and engaging learning experience for the majority of learners. These findings imply that audio-visual media can be a valuable instructional tool in enhancing Science learning outcomes at the elementary level. These results align with the study of (Arda S S 2016) which emphasized the effectiveness of interactive computer-based media in improving student engagement and comprehension in science learning. Similarly, (Omodara O D and Adu 2014 Relevance of Educational Media and Multimedia Technology for Effective Service Delivery in Teaching and Learning Processes IOSR Journal of Reseach & Methode in Education (IOSR-JRME) 4 48-51) highlighted how multimedia technologies enhance the teaching-learning process by catering to various learning styles and increasing content retention.

***Table 3. Significant Difference in the Performance of Grade 6 Pupils in Science Before and After the Use of Audio-Visual Media***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Performance of Grade 6 Pupils in Science*** | ***Mean*** | ***SD*** | ***t-value*** | ***p-value*** | ***Decision at 0.05*** |
| Pre-test Scores | 23.71 | 5.53 | -8.45 | <0.001 | Reject Ho |
| Post-test Scores | 33.36 | 1.60 |

The data in Table 3 reveals that there is a significant improvement in the science performance of Grade 6 pupils at Madatag Elementary School after the use of audio-visual media, with the mean score increasing from 23.71 in the pre-test to 33.36 in the post-test. The t-value of -8.45 and a p-value of less than 0.001 indicate that this difference is statistically significant, leading to the rejection of the null hypothesis. This implies that integrating audio-visual media into science instruction effectively enhances pupils’ understanding and retention of scientific concepts, suggesting its potential as a valuable tool in elementary education. [1] emphasized the role of interactive computer-based learning media in improving student engagement and understanding, particularly in science subjects, which supports the observed increase in post-test scores in this study. Similarly, [2] highlighted that the use of multimedia technology significantly enhances the effectiveness of teaching and learning processes, mirroring the improved learning outcomes seen among Grade 6 pupils at Madatag Elementary School. Furthermore, [3] affirmed that audio-visual materials serve as powerful instructional tools that promote better comprehension and retention, aligning closely with the positive impact observed in the pupils’ science performance after the intervention. The pre-test results revealed that most Grade 6 pupils at Madatag Elementary School struggled to meet the expected performance level in Science. Their responses indicated difficulty in understanding core topics such as friction and gravity.

A higher level of comprehension and consistency in their performance. They showed better understanding across the topics covered, and the results reflected a more uniform distribution of scores, indicating a generally improved learning experience among the class.

A comparison between pre-test and post-test scores showed a marked improvement in pupils’ Science performance after the use of audio-visual media. The statistical analysis confirmed that the difference in performance was significant, supporting the effectiveness of the audio-visual approach in enhancing students’ grasp of scientific concepts.

**5. CONCLUSION**

 The low pre-test scores imply that traditional teaching methods may not be effectively addressing the learning needs of Grade 6 pupils, particularly in complex science topics such as friction, gravity, and energy. This suggests a need for alternative instructional strategies that can better engage learners and simplify abstract concepts for improved comprehension.

 The improvement in students’ comprehension after using audio-visual media implies that multimedia tools can positively impact engagement and understanding in science education. This indicates that audio-visual materials not only make learning more interactive but also help create a more inclusive learning environment where students can grasp concepts at their own pace.

 The significant improvement between pre-test and post-test scores confirms the effectiveness of integrating audio-visual media in science instruction. This finding supports the idea of (Zhou, Y. 2023) that multimedia-based teaching can serve as a powerful tool for enhancing academic performance, thereby encouraging its broader use in elementary education to foster better learning outcomes.

**Ethical Approval:**

The researcher was formally seek permission from the Public Schools District Supervisor (PSDS) and the school Principal of Madatag Elementary School to conduct the research involving Grade 6 pupils

Consent

Respondents voluntarily agreed to participate after being fully informed about the purpose and potential implication of the study and their responses have been gathered with greatest respect for their privacy and confidentiality.

**Disclaimer (Artificial intelligence)**

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Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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1.

2.

3.

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