

Multimedia – Based Instruction in Distance Learning and Academic Performance

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Abstract

Since the advancement of information technology, multimedia has been increasingly popular as a means of storing data. This study aimed to determine the level of multimedia-based instruction in distance learning as to Animation, Audio, Image, Text, level of academic performance of the Grade V pupils for S.Y. 2021-2022, and its relationship between these variables. The questionnaire, The Use of Multimedia-Based Instruction, was modified from the study of Tagaro (2021). This study made use of the descriptive and quantitative research design. The respondents were 302 Grade V pupils of East 1 District Division of Cagayan de Oro City. Frequency, Percentage, Mean, and Standard Deviation were used to determine the quantitative data and Pearson Product Moment Correlation (r) for the test of significant relationships between the pupil's multimedia-based instruction in distance learning and academic performance. The findings show that the Level of the pupil's Multimedia-Based Instruction Animation and Audio resulted in a Very High level, but Image and Text resulted in a High level, while the Academic Performance resulted in a Very Satisfactory. The aforementioned multimedia-based instruction greatly affects the academic performance of the pupils, thus rejecting the null hypothesis. It is recommended that teachers know how to handle and teach pupils under multimedia-based instruction through training, seminars, and workshops to improve the variety of activities and strategies to provide better quality teaching and learning.

Keywords: *Text, Image, Audio, Animation, Academic Performance*

1. Introduction

One of the noblest professions is teaching because it involves knowledge and skill to impact the students. Every educator aspires to achieve global competitiveness in their specialization. Indeed, every teacher has a field of expertise that needs to be developed and practiced to meet their subjects' expected skills and competencies. Without skill-based subjects, a child is limited from learning anything and learning about other skills, which makes skill-based subjects crucial. It serves as a backbone and framework of any education. Moreover, when it comes to ensuring that pupils are fully developed, especially in schools, teachers' competency in delivering the teaching-learning process is paramount. Competent teachers impact students' academic growth and skills and aid in teachers' efforts to enhance their delivery methods. One of the skills a pupil needs to acquire is musical proficiency. However, teachers need also to be competent in teaching their specialization.

Education is a powerful agent in shaping the lives of every pupil. In the process, teachers are essential in constructing meaningful educational experiences. But it is undeniable that change has occurred due to the global health crisis; the educational system has changed to a new learning norm. Hence, the Department of Education (DepEd) in the Philippines calls for extensive preparation to adapt to the ever-changing teaching landscape to ensure pupils will continue their educational journey at home. Thus, DepEd employed multiple learning modalities as alternatives to face-to-face teaching and learning.

In response to the sudden disruption of classes due to the pandemic, learning with the use of multimedia has been strengthened. Since the pupils do not have the chance to attend face-to-face classes, Self

- Learning Modules and radio– and television-based lessons were the pupils’ partners in continuing their education. Through these multimedia materials, pupils could keep learning in the comforts of their homes even with their parents and guardians, who were considered the new normal teachers. However, some of the few things that hinder the pupil from accessing multimedia materials, such as the audio–video materials, are the unavailability of electronic devices, internet connection, and television and radio services. Now that face-to-face classes are made possible, these multimedia materials are the teachers’ partners in delivering many effective lessons. Since technology has progressed, teachers have been integrating audio and animated audio-visual materials with the used books as learning materials.

In addition, distance learning offers the pupils the chance to learn on their terms, wherever they are, and at any time, opening up the option of lifelong learning. More schools are using these technologies in the educational process, more pupils are studying remotely, and more international educational institutions are being established in all nations of the world. The convergence of curriculum and technological instruction defines modern education (Karimov & Kasimov, 2018). Because they have changed the focus of education from teacher-centered to learner-centered, multimedia-based technologies, significantly impact the learning activities engage in daily (Khamparia & Pandey, 2018).

Moreover, multimedia has evolved into an essential component of every performance. It has given rise to various presentations, from entertaining to instructive. The need for multimedia content has increased along with internet expansion. The term multimedia refers to media that uses a variety of information processing and content, such as text, audio, graphics, animation, and video interactivity. To inform or amuse the user. Multimedia also refers to the use of electronic media for multimedia material storage and knowledge. Like traditional, varied mediums in fine art, multimedia offers a broader range of possibilities (Pavithra et al., 2018).

Indeed, technological advancement is essential to teaching, learning, and faculty development. For example, the interactive teaching materials with multimedia components make it simple and effective to understand a course. Furthermore, in online learning, multimedia and image processing-based instructional strategies in web-based learning systems have become more significant (Kumar et al., 2019).

As an observation during distance learning, using these learning delivery modes is a big challenge to the pupils since there is less teacher–pupil interaction, assessment, and reflection time is minimal. Yet, since these are pre-recorded materials, pupils can review these lessons at their own pace. On the other hand, on the teacher–presenters’ end, filming, recording, and editing consume a lot of time in preparing these materials. Moreover, there are insufficient modules, most images are not printed, fonts are in small sizes, and the words used are not localized. Thus, this study aims to determine the use of multimedia – based instruction in distance learning and their academic performance among the Grade V pupils in East I District.

This study is anchored on Mayer’s (2017) Cognitive Theory of Multimedia Learning and Social Agency Theory. The cognitive theory of multimedia learning clarifies that both the ears and eyes impact the meaningful understanding of the learners. The pupil holds the materials inside the pupil’s auditory and visual sensory memory through the ears and eyes. If the pupils keep these materials inside their sensory memories for at least twenty seconds, they can be moved to working memory to be processed later. After that, the pupil cognitively integrates the incoming verbal and visual data into coherent oral and coherent visual representations. Finally, the pupil accesses and stores pertinent prior knowledge in working memory after retrieving it from long-term memory alongside the verbal and graphical models. Previously limited to working memory, the learning result may be retained in long-term memory. Even if the teacher plans lessons or provides resources to accomplish instructional goals, pupils may lack the motivation to utilize their cognitive ability to make sense of the given information, thereby integrating the social agency theory.

On the other hand, the Social Agency Theory proposes that social cues in the class can promote a social stance in the pupils, in which the teacher is seen as a social partner. When pupils have a sense of social collaboration with their teacher, they will attempt to comprehend the teacher’s instructions based on their perceptions, resulting in improved learning outcomes. Therefore, teachers must provide meaningful

instructions through accessible and exciting learning materials and strategies.

This study also anchored on the Department of Education's use of Blended Learning modalities. The Distance Learning Delivery Modalities framework discussed in DMCI Memo 162, s. 2020 which clarified that blended learning is any combination of face-to-face with a mix of Online Distance Learning, Modular Distance Learning, and Television/Radio-Based Instruction.

2. Methodology

This study used the descriptive type of research. A descriptive survey is a practical technique when understanding of a phenomenon is not too incomplete, the variables and context can be described in detail, and the goal is to determine the strength of a particular relationship. While determining causal linkages is not always the goal of descriptive surveys, they may offer a useful way to examine a representative sample and enable the collection of information on specific concerns that may be utilized as the foundation for future decision-making (Maffezzoli et al., 2022); hence, it employed descriptive methods in describing and interpreting the conditions and relationships that exist between the variables that are presented in the conceptual framework. This research is designed to identify and assess the pupil's multimedia-based instruction in distance learning and academic performance of the Grade V pupils of the elementary schools in East 1 District School Year 2021-2022.

The respondents of the study were the Grade V pupils from four (4) public elementary schools in East 1 District, Cagayan de Oro City, for the School Year 2021 – 2022. This is composed of a total of one thousand three hundred twelve (1,312) Grade V pupils. The three hundred two (302) respondents are computed through Slovin's Formula. The learner respondents from each school representative answered the questionnaire during the conduct of the study. The researcher modified a survey questionnaire from Tagaro (2021) on The Perception of the Different Multimedia Elements Combinations Commonly Used in Online Distance Learning in Filipino as the primary tool in this study to offer and collect as many data as feasible for pertinent evaluation. The questionnaire was used to assess the relationship between multimedia – based instruction in distance learning and the academic performance of the pupils, respectively.

In this study, the following statistical tools were used to treat, analyze and interpret the results: Frequency and Percentage to determine the respondents' distribution in each category; Mean and Standard Deviation to analyze the quantitative data that were gathered in this study and Pearson Product Moment Correlation (r) at a 5% level of significance test for significant relationships between the pupil's multimedia-based instruction in distance learning and academic performance.

3. Results and Discussion

Table 1

Summary of the Grade V pupil's Multimedia Based Instruction

Multimedia-Based Instruction Variables			Mean	SD	Description	Interpretation
Animation			4.29	0.81	Always	Very High
Audio			4.28	0.83	Always	Very High
Image			4.26	0.87	Always	Very High
Text			4.26	0.86	Always	Very High
Overall Mean			4.27	0.84	Always	Very High
Note:	4.20 – 5.00	Always	3.40 – 4.19		Frequently	
	2.60 – 3.39	Sometimes	1.80 – 2.59		Rarely	
	1.00 – 1.79	Never				

Table 1 shows the summary of the Grade V Pupil's Multimedia Based Instruction. It has an Overall Mean of 4.27 with SD=0.84, which is described as Always and interpreted as Very High. This means that the

pupils were able to gain the highest overall level of multimedia-based instruction. The pupils felt that they were able to experience multimedia-based instruction at its fullest as they rated it as outstanding or the highest level. The learning process is varied and enhanced with multimedia information, which improves knowledge retention. Pupils may have additional opportunities to interact with the material if an educational video is available. The course material that is made available through it is available to pupils all over the world. Using multimedia can sometimes better access different eras and places and demonstrate complicated ideas than speaking alone. It can also assist teachers and pupils in getting around obstacles like lengthy class periods and time constraints. Moreover, children can explore and learn about locations they would never have visited with the use of multimedia. Pupils can investigate various cities around the world, the highest mountains, and the most dangerous jungles in a geography class. Exploration of space and planets is now possible in a Science class. For Biology pupils who are using a multimedia learning environment, dissecting uncommon animals and learning about various environments are as easy as a stroll in the park.

Multimedia learning environments collectively have a direct impact on learning and even on personal development. A result that is different and more difficult to obtain with conventional educational resources. Therefore, it should come as no surprise that the technology industry is growing and that schools are increasingly motivated to develop multimedia learning environments for their pupils (Barba, 2022).

In the same table, the highest mean is the *Animation*. It got a Mean of 4.29 with SD=0.81, which is described as Always and interpreted as Very High. This means that the pupils have the highest regard in terms of the aid that animation has provided them in their studies. Thus, the pupils find it more interesting and helpful to learn when animation is integrated into the teaching and learning process. The content, the intended learning outcome, the instructional strategy, and the delivery medium all play a role in how effective a lesson is. The combination of these four components might result in a learning module known as multimedia learning or learning through the use of multimedia. Two key considerations must be made to ensure that the learning process using computer-based multimedia runs smoothly: how the content is presented and the pupil's preferred method of assimilating and translating the information into useful knowledge. It first has to do with how people learn and how the knowledge is visualized. The second one has to do with the pupil's preferred method of learning. Since the use of animation is fun, interesting, and exciting for the pupils, it is now the duty of the teachers to explore its effects on pupils' learning outcomes (Rusli et al., 2017).

Meanwhile, the lowest is *Image and Text*. It has an Overall Mean of 4.26 with SD=0.86 and 0.87, which is described as Always and interpreted as Very High. This means that although these variables were rated at the highest level, their scores barely qualify for the outstanding level. Teachers should make adjustments and innovations when using text and image in the teaching and learning process with the use of multimedia-based instructions. Pupils find text and image lesser interesting compared to audio and animations. On the other hand, animation quickly grabs the pupils' interest and makes learning fun. The pupils' understanding of the teachings will improve since they will be able to keep their focus on listening and watching the teacher presenter. Thus, it is important to note these results in order to have better ideas and plans to maintain classroom learning and activities fun and exciting for the learners.

According to Noor (2020), there are a number of benefits and advantages of adopting multimedia as instructional material. However, some of the restrictions might materialize on the pupil's background and the suitability of the topic. In this situation, teachers play a crucial role in selecting the most effective teaching methods to utilize in the classroom and teaching strategies that can enhance students' comprehension and visualization abilities. Thus, multimedia-based instruction's success lies in the teachers' hands.

Table 2 discloses the Grade V Pupils' Academic Performance. It has an Overall Mean of 89.23 with SD=3.04, which is described as Very Satisfactory. Moreover, one hundred forty (140) out of three hundred-two (302) or 46.36% of the pupils got the scores at an outstanding level, one hundred forty-eight (148) out of three hundred-two (302) or 49.01% of the pupils got the scores at a very satisfactory level, and fourteen (14) out of three hundred-two (302) or 4.63% of the students got the scores at a satisfactory level. This implies that the pupils were able to achieve the second-highest level of academic performance.

Table 2
Grade V Pupils' Academic Performance

Level of Performance	Frequency	Percentage	Mean	SD	Description
Outstanding	140	46.36	89.23	3.04	Very Satisfactory
Very Satisfactory	148	49.01			
Satisfactory	14	4.63			
Fairly Satisfactory	0	0			
Did not Meet Expectation	0	0			
Total	302	100.00			
Note: 90%-100% Outstanding 85%-89% Very Satisfactory 80%-84% Satisfactory 75%-79% Fairly Satisfactory 74% and Below Did not Meet Expectations					

Academic Performance in any subject for pupils is crucial to their success and learning development. It will allow them to develop higher-order skills and evaluate if they are now ready for higher grade levels. Therefore, mastery and understanding of each subject concept is a must for pupils in their growth and development to be considered academically good and ready. Education is a potent agent of change that creates skilled labor, enhances health and livelihoods, speeds up economic development, and resolves a community's actual issues. Pupils must dedicate a significant amount of their time to their studies in order to graduate with strong academic standing. Academically successful pupils are more likely to have better employment benefits, higher income, higher levels of self-confidence and self-esteem, lower levels of anxiety and depression, and lower rates of substance addiction (Tadese et al., 2022).

Table 3
Test correlation of Pupils' Multimedia Based Instruction and Academic Performance

Multimedia Variables	Academic Performance		Description	Interpretation
	r-value	p-value		
Animation	0.9767	0.000	Strong Positive Relationship	Significant
Audio	0.8013	0.682	Strong Positive Relationship	Significant
Image	0.8859	0.000	Strong Positive Relationship	Significant
Text	0.9132	0.000	Strong Positive Relationship	Significant

Note: S – Significant if and only if computed p-value is lower than 0.05
NS – Not Significant if and only if computed p-value is equal or higher than 0.05

Table 3 exhibits the test of the correlation between Pupils' Multimedia Based Instruction and Academic Performance. In terms of Animation, it registered a computed r-value of 0.9767 (p-value=0.000) with the description of a strong positive relationship and is significant at 0.05 level of significance. This means that a significant relationship was registered between the use of animation in multimedia-based instruction towards pupils' academic performance. Thus, the null hypothesis is rejected. This indicates that the implementation of animation in multimedia-based instruction during the teaching and learning process has a significant impact on the pupils' academic achievement. Teachers should focus on finding educational materials with animation since it makes the teaching and learning process more enjoyable and engaging for students. Movements, colors, shapes, and transitions in animation allow the pupils to spark their imagination, making them apply and share what they have understood about the lesson. Based on Rusli et al. (2017) study findings, it is possible to conclude that the outcome of the pupils' learning were improved by the use of animation in multimedia interactive learning, especially in the implementation of concepts, methods, and principles. The differing learning preferences of pupils in terms of verbal versus visual can also have an impact on how well they learn.

Further, in terms of Audio, it got a computed r-value of 0.8013 (p-value=0.000), as a strong positive relationship and is significant at 0.05 level of significance. This means that a significant relationship was

registered between the use of audio in multimedia-based instruction towards pupils' academic performance. Thus, the null hypothesis is rejected. This indicates that the academic performance of the pupils is much improved by the inclusion of audio elements in multimedia-based instruction during the teaching and learning process. Teachers should focus on finding educational materials that incorporate audio since it encourages pupils to enjoy and be interested in the teaching and learning process. The academic performance of the pupil is influenced by the teacher-tone presenters of voice, variety of voice expressions, choice of sound effects, and background music; as a result, these aspects should be used with care to improve the teaching and learning process. Digital environments featuring elements with visual, audio, or visual-audio features that appeal to people's auditory and visual senses in combination are referred to as multimedia environments. Films, commercials, tourism, and other industries all education and business use these settings. Bulut (2019) stated that instruction based on a multimedia environment has considerably more positive benefits on academic accomplishment, and it also makes the learning environment much more intelligible and extra enjoyable.

In terms of Image, it got a computed r-value of 0.8859 (p-value=0.000) with the description of strong positive relationship and is significant at 0.05 level of significance. This means that a significant relationship was registered between the use of the image in multimedia-based instruction towards pupils' academic performance. Thus, the null hypothesis is rejected. This means that the academic performance of the pupils is much improved by the usage of image materials in multimedia-based instruction during the teaching and learning process. In order to encourage pupils to appreciate and be interested in the teaching and learning process, teachers should rely on seeking for instructional resources that incorporate graphics. Some of the characteristics that pupils appreciate the most and that encourage their participation in the teaching and learning process include colors, brightness and contrast, clarity, and the appropriateness of the images utilized. Particularly in educational settings, people have different capacities for and preferences for knowledge consumption. Some pupils may prefer reading, seeing, or hearing information; their accessibility requirements may also affect their preferences. Nevertheless, while accessibility for images frequently focuses on offering a text alternative for screen-reader users, teachers may also approach the problem from the opposite direction by offering a graphic alternative for text to help readers understand the underlying information or notion. This applies to those who have reading issues as well (Post, 2022).

In terms of Text, it got a computed r-value of 0.9132 (p-value=0.000) with the description of strong positive relationship and is significant at 0.05 level of significance. This means that a significant relationship was registered between the use of text in multimedia-based instruction towards pupils' academic performance. Thus, the null hypothesis is rejected. This means that the use of text or printed materials in multimedia-based instruction in a teaching and learning process is very useful in improving pupils' academic performance. Teachers should bank on looking for instructional materials that involves the use of texts as it allows learners to enjoy and be interested in the teaching and learning process. Clear and concise instructions, simplicity of words used, and stimulating statements motivate the pupils to read, understand and enjoy what they are reading. Through printed materials, pupils learn new things as it enhances their vocabulary, curiosity, interest, and imagination. The findings of the study by Akinoso (2018) proved that the usage of texts that resemble multimedia could, in certain cases, improve pupils' learning. The utilization of multimedia techniques improved pupils' academic performance to a particular degree. To be able to teach using multimedia, teachers must have a sufficient understanding and mastery of using computers. As a result, in-service training should be used periodically to update their skills.

4. Conclusions and Recommendations

Based on the summary of findings, the following conclusions were derived from this study:

1. Animation and were found effective in using multimedia-based instruction.
2. The pupils had an overall Very Satisfactory academic performance for the School Year 2021-

2022. The pupils were able to achieve the second-highest level of academic performance. This proves that integrating multimedia-based instruction in the daily lesson has a positive effect in term of the development of the academic performance of the pupils. It makes their learning fun, interesting and exciting.

3. Finally, a significant relationship was registered between the use of animation in multimedia-based instruction towards pupils' academic performance. Thus, the null hypothesis is rejected. This means that the pupils found more interest in learning when animation is integrated into the teaching and learning process which enables them in the retention of knowledge.

Based on the above findings and conclusions, the following recommendations are presented:

1. Teachers consider resources that involve the use of multimedia-based instruction in text and images in the teaching and learning process, as it can be observed that it is effective on the academic performance of the pupils.

2. Teachers consider further training, seminars, and workshops to improve the variety of activities and strategies in order to provide better quality teaching in the use of multimedia and enhance the academic performance of the pupils.

3. Teachers consider to monitor the progress of the pupils in terms of integrating animation in the teaching and learning process such as conducting pre-tests and post-tests and look for resources to foster learning.

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