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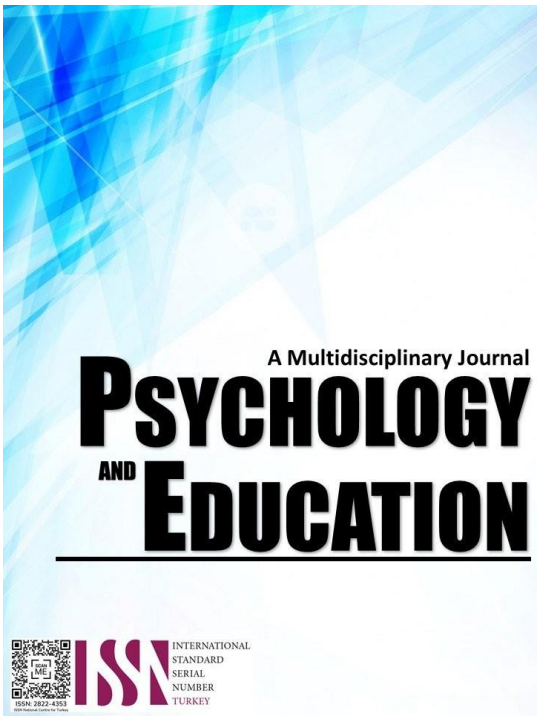

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Research Article

The Use of Video-Based Instructional Material to Improve Learning Competency of the Students in Selected Topics in Biology at Satriwithaya School, Bangkok, Thailand

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Abstract

This research explored the utilization of video-based instructional material in enhancing learning competency among a group of sixty (60) students enrolled in grade 8 at Satriwithaya School in Bangkok, Thailand. The study was carried out during the 2nd semester of S.Y. 2023–2024. The respondents were chosen using the approach of purposive sampling. The research study employed an experimental approach and utilized quantitative research. Through the use of a one-group pre- and post-test, the researcher was able to gather the necessary data. The study included statistical measures such as percentages, means, and standard deviations, as well as dependent and independent t-tests, to assess and compare the proficiency and efficacy of utilizing video-based educational materials among students at Satriwithaya School in Bangkok, Thailand. Study findings also revealed that there is a significant difference in pre- and post-test assessment scores before and after using the video-based instructional materials. The research outcomes indicated that the application of video-based teaching resources as an instructional strategy in the field of biology resulted in an increased degree of effectiveness in the students' learning process. The findings of the study suggest that the utilization of video-based instructional materials has favorable outcomes in terms of enhancing pedagogical and educational achievements in the field of biology. This methodology has been demonstrated to provide learners with the chance to enhance their comprehension through active participation and cultivate their imagination and cleverness, consequently facilitating enhanced educational achievements. Furthermore, the establishment of a conducive learning atmosphere that is both engaging and pleasurable for students can enhance their overall learning experience. Moreover, this approach enhances the teacher's capacity to convey their intended educational objectives to their students proficiently.

Keywords: *video-based instructional materials, utilization, student competency, selected topics in biology*

Introduction

In the field of science, Thailand is doing everything possible to improve the country's science education. One strategy is to establish science schools to encourage students to pursue careers in science and technology, nurture their natural scientific potential, and teach the best for students. In addition, despite tremendous economic progress in Thailand over the past few decades, the country's STEM education system falls short of that of its competitors (The World Bank, 2019). Thailand's science teacher education has been undergoing educational reform since 1999. The National Education Act and the 2001 Basic Education Core Curriculum addressed science education goals in which science and technology skills were recognized as a key catalyst in the development of a country's human resources (Institutes for the Promotion of Teaching Science and Technology (IPST)

The Thai education system, in particular, is being targeted for development in order to spark an interest in science among future generations of Thai students. The quality of Thai education varies greatly across the country. Access to high-quality resources and competent instructors varies between urban and rural regions, which has a substantial influence on kids' education. Students in Bangkok typically get high standardized test scores, although results in rural regions range from medium to poor year after year (Educational Testing Institute, 2019). Creating a more equitable level of scientific education throughout Thailand is a primary aim for the Thai government in order to enhance the country's living standards and quality of life. According to the PISA 2022 assessment results, 15-year-old high school students in

Thailand score on average 409 points in science, whereas countries within the Organization for Economic Co-operation and Development (OECD)score 485 points on average. This indicates that the competence of Thai learners in science is lower than that of its neighboring countries. The average scores for science, math, and reading in 2022 were lower than those for 2018. Average performance was worse in 2022 than it was in any prior examination in all three areas (science, math, and reading); the decline in mean scores between 2018 and 2022 validated and strengthened a trend that started earlier, between 2012 and 2015. Performance decreased by almost 30 points in science and math and nearly 60 points in reading between 2012 and 2022. Following this, the science average score in the Northeast region was 418, which was below the Thai average (OECD, 2019), particularly in the provinces inside the Mekong River Basin (MRB). The impediments to collaboration in improving the quality of science education at various levels have been the source of the cause for action. As a result, it's critical to adapt, stay up-to-date with the effects of globalization, and raise Thai high school students' competence in school.

As a result, educational institutions have used media to motivate their students. Conversely, the majority of educators prioritize the creation and invention of instructional strategies rather than learning innovations that support students' ability to learn on their own and increase their use of teacher-prepared media to find knowledge. An estimated 56% of Thai pupils are proficient in science at Level 2, according to OECD study from 2019. Nonetheless, it is evident that Thai students still have poorer scientific competence than the

average of other countries. At this level, students could describe well-known and fundamental scientific phenomena and indicate appropriately reached conclusions compatible with existing evidence (OECD-Organization for Economic Co-operation and Development, 2019).

A crucial competence gap regarding the distinct dynamics of the educational environment emerged when the researcher explored more into this area of student learning competency, particularly with regard to Grade 8 students. There seems to be a lack of comprehensive study on the competency level of these specific students, despite ongoing efforts to explore various aspects of student learning. This research gap highlights the critical need for more investigation into the variables influencing the academic performance and learning outcomes of Grade 8 learners, paving the way for more targeted interventions and instructional strategies.

According to Corpuz and Tindowen (2021), the primary causes are the content limitations in the classroom and the dearth of opportunity for higher order thinking. In addition, the limitations of experimental practice and the emphasis on memorization over exploration of information were present in the science education system.

The ultimate objective of science learning is scientific literacy, according to the Institutes for the Promotion of Teaching Science and Technology (IPST). As a result, all students must be scientifically educated. Thailand education system is designed to prepare learners to gain scientific knowledge through research, finding patterns in data, and solving scientific and technical challenges. The scientific curriculum is divided into eight strands: living things and processes of life; life and the environment; substances and qualities of substances; and nature of science and technology (Bureau of Academic Affairs and Educational Standards Thailand [BAAEST], 2020). However, students in all grade levels in Thailand must learn the topic in all eight strands. As a result, science instructors are exposed to teaching science via a constructivist lens, and the primary teaching methodologies include inquiry-based learning, project-based learning, and problem-based learning.

Furthermore, the advancement of digital technologies has had a significant impact on the planning and outlook of education in Thailand. In order to achieve the vision of a "Smart Thailand," it is necessary to invest in enhancing technology infrastructure and developing the skills of the population, leading to the establishment of a smart and knowledge-based society (Marc et al., 2020). The importance of lifelong learning is highlighted in Thailand, where citizens are provided with equal educational opportunities through the use of digital technology. In addition to this trend, educational institutions need to be proficient in designing curricula that can align with the national education policy and meet the necessary requirements in order to enhance the expected learning outcomes. The use of video-based teaching and learning materials is becoming more prevalent in high schools in Thailand as digital technologies continue to advance. According to the standards set by the Organization for Economic Co-operation and Development, the assessment results indicated that Thai students achieved higher science scores when they were taught using video-based materials. According to Halder and Saha (2023), it is crucial to give serious consideration to enhancing the skills and capabilities of teachers and students in high schools in Thailand (Chang et al., 2020).

As stated in the periodical issued by the UNESCO Regional Office in Asia (The United Nations Educational, Scientific, and Cultural Organization), science education is a key concern in practically all Asian countries, and it has been given great importance in terms of growth and quality enhancement. Scarce resources have been devoted in the hope that this investment will provide rewards for national development projects. Science is increasingly recognized as requiring special attention, not only as a school topic but also for its importance in many aspects of daily life and as an important element of everyone's fundamental education. In terms of quantifiable increases, scientific education has outpaced overall enrollment growth. In all countries in the region, primary science is one of the fundamental disciplines that are required to be studied. By far the most significant recent development in the region's emerging countries has been the establishment of a distinct institution for scientific curriculum development. Without exception, all Asian countries have selected the curriculum as the main point of their plans to reform scientific education. In some ways, this was unavoidable: a curriculum is a physical manifestation of what happens in education as a formally ordered activity. It also suggested that scientific education programs would have to be designed within the constraints of the present educational system. Included among the selected topics in Biology under body structures are the respiratory system that deals with the proper breathing- in and out that enable us to do gas exchange, the circulatory system that is responsible for proper flowing of blood with nutrients (oxygenated blood) and the blood with carbon dioxide (deoxygenated blood). Science is essential for everyone to better understand the human body's life processes and to maintain a level of structural organization at the chemical, cellular, tissue, organ, organ system, and organismal levels (Samosa, 2021).

In today's increasingly competitive world, videos provide a more engaging sensory experience than print materials alone. Students can see and hear the concept being taught, and their brains can process it similarly to how they do in everyday interactions. Educational videos have become an important tool for delivering content in many physical, blended, and online classes. When instructors consider elements such as how to manage the cognitive load of the video, how to maximize student engagement with the video, and how to promote active learning from video, the effectiveness of video as an educational tool improves. This research will aid in the review of the literature and important information related to each principle under theoretical framework of this study, which will suggest practical ways for instructors to use video as an educational tool to improve students' abilities (Prestiadi, 2020).

Because video has become an important part of higher education, students are increasingly interested in the study of science, particularly in the study of some selected topics in biology such as body structures and respiratory and circulatory system. It is taught in traditional

courses, serves as the foundation for many blended courses, and is frequently the primary means of information delivery in online courses. Other studies' findings have shown that technology can improve learning in some meta-analyses and many studies have shown that video, in particular, can be a very effective educational tool (Velunta, 2021).

On top of that, video may be particularly useful for student preparation in science classes, partly because students may find it more engaging and partly because it may be suitable for illuminating a difficult concept to understand. Many biology classes concentrate on this topic. However, it has been demonstrated that large portions of educational videos are frequently ignored by students, and other studies have found that these contribute little to student's performance or competitiveness.

Hence, the use of learning media such as video-based lessons is a teaching tool that can provide concrete experiences, motivation, and enhanced absorption and memory for students. Different tools were used to avoid using words altogether in its development. Computers and the Internet were originally conceived as means of facilitating the study of moving images, video, and other forms of multimedia. Symbols are used to convey the message, which is then decoded by the recipient. Video lectures can help students participate actively and understand the material presented in each class. The use of electronic technology in education is a powerful tool for disseminating content and enhancing instruction and evaluation. Using interactive learning media built on multimedia is crucial to elevating the standard of education and preparing students for the modern job market (Samosa, 2020).

Competence, on the other hand, is a mix of knowledge, skills, values, and attitudes that can be observed in patterns of behavior. To perform one's duties to the best of one's ability, one must demonstrate competence through the application of one's knowledge and abilities. So, competence is everything an individual brings to the table in terms of their own knowledge, abilities, and motivations in order to do a job successfully. Competence, then, refers to an individual's skill and knowledge in carrying out a given task. This means that videos can serve as useful learning resources (Pakpahan, 2019).

The researcher wanted to study this topic for the reason of wanting to know the utilization of video-based teaching on student learning in order to discover what could be used to develop a strategy for increasing educational institutions' capabilities to provide high- quality science education. This research is significant because educators must identify the potential for cultivating student engagement in the classroom using technology (Escandor, 2022). This investigation stands out from others of its kind due to the lack of similar studies and the novelty of the topic (the utilization of video-based lessons as a teaching tool). This is also why the researcher is curious about the use of video-based teaching tools to assist students in learning selected topics in biology. This study will shed light on how it affects students' abilities and whether they benefit or not. The findings of this study can be used in the classroom as a pedagogical resource as well as a means of discovering resources to help teachers facilitate their students' learning.

In most cases, teachers generally use the resources readily available to them, although they may also be involved in the process of selecting and preparing those resources. Furthermore, the purpose of this study is to determine how educators can effectively use video-based learning as a pedagogical resource to enhance student learning. In addition, educators will gain the necessary knowledge to use this method in an effective way.

Research Questions

The study aims to determine the use of video-based instructional material to improve the learning competency of grade 8 students in selected topics in biology at Satriwithaya School, Bangkok, Thailand. Specifically, this research sought to answer the following questions:

1. What are the competency levels of Grade 8 students at Satriwithaya School in Bangkok, Thailand, before and after using the video-based instructional material in the following topics:
    1.1. body structures and respiratory system; and
    1.2. circulatory system?
2. Is there a significant difference in the scores on a selected topic in biology of the Grade 8 students of Satriwithaya School in Bangkok, Thailand, before and after using the video-based instructional material?
3. Is the video-based instructional material effective or not in improving the competency level on selected topics in Biology by the Grade 8 students at Satriwithaya School in Bangkok, Thailand?
4. What enrichment program could be crafted by the researcher based on the findings of the study?

Methodology

Research Design

The research design utilized in this study is a pre-experimental design (one group pre-test/post-test). This design involved one group that took a pre-test (O1), a treatment (X), and a post-test (O2). It aimed to determine whether there is significant development before and after using the video-based instructional materials on selected topics in biology.

Treatment X which is the Video-based Instructional Materials on Selected Topics in Biology serve as the independent variable.

In this study, the sample group was pre-tested to determine the degree of competency of the students before the treatment, and then

they were introduced to the video-based instructional material (created video-based instructional material by this researcher by means of compiling video animations from various sources). The treatment of video-based instructional material on chosen topics in biology in this study is the process of delivering information to raise the students' level of knowledge and understanding. Finally, the researcher administered a post-test to the sample group to assess the sample group's capacity following treatment. The comparison of individual student results on the pre-test and post-test showed whether or not there is an effect. Furthermore, in this study being a one group experimental design, only the experimental class and no control class were used.

Pre-Test	Treatment	Post-Test
O1	X	O2

Note: *O1: Students' scores before given the treatment*
X: Treatment (Video-Based Instructional Material on Selected Topics in Biology)
O2: Students' scores after given the treatment

(Adapted From Cohen et al.)

Participants

According to information that was provided by one of the administrators of the Lower High School Department of Satriwithaya School in Bangkok, the total number of 1,618 students enrolled in Lower High School makes up a portion of Satriwithaya School's overall population for school year 2023-2024.

Respondents for this study included a total of 60 lower high school level grade 8 students. Conducting research with a group of 60 students in the 8th grade has many advantages that all contribute to the study's reliability and rigor. This optimal sample size balances statistical power, authenticity, manageability, accuracy, and reliability for comprehensive and informative studies in learning contexts. Consequently, the researcher confidently utilized this sample size to enhance our comprehension of student levels of competence and to direct the development of educational strategies that are grounded in empirical data.

Instruments

In the conduct of this study, pre-test and post-test questionnaires composed of 60 questions in selected topics in biology (body structures, respiratory and circulatory system) were used and distributed online through Google Forms. The pre-test and post-test questionnaires consisted of a series of random questions designed related to selected topics in biology to elicit data and information from the respondents to determine their competency, and the effectiveness of video-based instructional material in the study of biology by the respondents.

The research instrument underwent the following processes before its administration to the respondents. First was the constructions and validation of the pre-test and post-test questionnaires. Second was the reliability testing by administering the test to a group not involved in the study as respondents but whose characteristics are similar to the actual respondents. Lastly was the validation of the instruments which were then duly certified by the experts and specialists.

Procedure

To assure the validity and reliability of the obtained data, an organized methodology was used. This entailed a series of visits with participants, as well as securing an administrative approval to conduct the study.

First, the pre-test was administered to grade 8 students in order to obtain the before- study test scores. Second, grade 8 students were introduced to video-based instructional materials to enhance learning and competency on selected topics in biology. Lastly, students were given a post-test of the same version as the pre-test after they studied the selected topics in biology using video-based instructional materials, and the scores were collected to analyze by applying statistical methods.

Data Analysis

Data were analyzed according to the following procedures:

How video-based instructional materials improve learning in body structure, respiratory, and circulatory systems for grade 8 students was determined using the E1/E2 = 80/80 model (Brahmawong 2009) where E1 is the percentage of the average or means of all scores the students earn from their pretest and E2 is the percentage of the average or means of all scores the students earn from their post-test.

Dependent t-test

The dependent t-test was used to compare the before study test scores and the after- study test scores on selected topics in biology through video-based instructional materials by the Grade 8 students at Satriwithaya School in Bangkok, Thailand. This is an appropriate tool because it finds the significant difference between the means of two groups and how they are related.

Weighted Mean

This was used to get the average response of the respondents. A weighted mean was used to measure the effectiveness of the video-based instructional material in improving the level of competency of selected topics in Biology by the Grade 8 students at Satriwithaya

School in Bangkok, Thailand.

Furthermore, the weighted mean is a type of mean that is calculated by multiplying the weight (or probability) associated with a particular event or outcome with its associated quantitative outcome and then summing all the products together.

Likert Scale

This was used in the study to determine the effectiveness of the utilization of video- based instructional material based on the scores of the students. It is a rating scale that is used to evaluate individuals' thoughts, attitudes, and actions. It is often used in research because it enables the researcher to simply operationalize respondents' personality characteristics or views.

In this study, the researcher used descriptive analysis to explain, illustrate, and summarize data points in a constructive manner so that patterns that developed satisfied all of the conditions of the data. The Likert Scale weighted mean for the students' test scores from pre-tests and post-tests.

Numerical Scale	*Mean Range Interval Scale*	*Mean Descriptive Equivalent*
1	1.00-1.79	Very Low
2	1.80-2.59	Low
3	2.60-3.39	Moderate
4	3.40-4.19	High
5	4.20-5.0	Very High

Results and Discussion

This section provides the presentation, analysis, and interpretation of data. This chapter focuses on analyzing and interpreting the data collected from the respondents in relation to the problem stated in the SOP. The analysis and textual presentation were organized in tables, which were categorized under various parts.

The significant development before and after using the video-based instructional materials on selected topics in biology (body structure & respiratory and circulatory system) was determined. To strengthen the results, t-tests, w-tests, and pre- and post-tests were also applied. The first part presented the competency level of Grade 8 students before and after using the video-based instructional material. The second part showed the test for significant differences in the scores of the Grade 8 students on selected topics in Biology before and after using the video-based instructional material. The third part showed the effectiveness of improving the mastery of selected topics in Biology by the Grade 8 students. Lastly, it shows the proposed intervention program based on the study findings.

Part I. Competency Level in Selected Topics (Body Structures, Respiratory, and Circulatory Systems) in Biology of Grade 8 Students at Satriwithaya School in Bangkok, Thailand, before and after Using Video-Based Instructional Material

Table 1.1. *Result of Frequency and Percentage Distribution of the Pre-Test Before Respondents use the Video-Based Instructional Material on Body Structures, Respiratory, and Circulatory Systems*

Percentage of Marks	*Competency Level*	*Frequency*	*Percentage (%)*
91 and above	Outstanding	0	0.00
81 to 90	Excellent	5	8.33
71 to 80	Very Good	13	21.67
61 to 70	Good	17	28.33
51 to 60	Fair	17	28.33
41 to 50	Below Average	7	11.67
Below 40	Failed	1	1.67
	Total	60	100.00
Mean	38.33		
SD	7.12		

Table 1.1 shows the competency level of the students before using the video-based instructional materials under the topics of body structures, respiratory, and circulatory systems based on the percentage frequency result of the test. Based on the data above, out of the 60 students in grade 8, 28.33% achieved a good score, and another 28.33% received a fair score. The lowest frequency of 1.67% is for one whose competency level is described as failed. There were 5 students, however, who received a percentage mark in the range of 81 to 90, described as excellent competency level.

The percentage of competency levels of the students before using the video-based instructional materials rated as good or fair is higher than those rated as excellent. The results indicate that the majority of the students possess a satisfactory level of competency even prior to utilizing the video-based teaching material.

Table 1.2 shows the competency level of the students after using the video-based instructional materials under the topics of body

structures, respiratory, and circulatory systems based on the percentage frequency result of the test. Based on the data above, it reveals that out of 60 respondents, 26.67% got the highest score that can be described as outstanding, while 1.67% got the lowest average score, which can be described as indicating that the student failed to obtain the score set to pass it.

Table 1.2. *Result of Frequency and Percentage Distribution of the Post-Test After Respondents Use the Video-Based Instructional Material on Body Structures, Circulatory, and Respiratory Systems*

Percentage of Marks	*Competency Level*	*Frequency*	*Percentage (%)*
91 and above	Outstanding	16	26.67
81 to 90	Excellent	11	18.33
71 to 80	Very Good	13	21.67
61 to 70	Good	12	20.00
51 to 60	Fair	5	8.33
41 to 50	Below Average	2	3.33
Below 40	Failed	1	1.67
	Total	60	100.00
Mean	46.83		
SD	9.33		

The table also illustrates that the percentage of students who attained the higher levels of competency increased. The results indicate that the majority of students who used the videos as part of learning the topics in Biology showed improvement in their understanding and knowledge. Additionally, according to Fabunan and Ventura (2021), in the modern educational environment, digital technology enables educators to come up with brand-new explanations for what kids learn, how they learn, where they learn, and when they learn it. Given its ability to help students understand concepts more deeply than other growing fields of technology, video has been one of the most often used tools for teaching and learning.

Part II. Significant Difference in the Scores of the Grade 8 Students of Satriwithaya School Bangkok, Thailand, on a Selected Topic in Biology Before and After using the Video-Based Instructional Material

Table 2. *Result of t-Test for Dependent Samples: Comparison in the Scores on Selected Topics (Body Structures and Respiratory and Circulatory Systems) in Biology of Grade 8 Students of Satriwithaya School, before and after using the Video- Based Instructional Material*

Indicator	*Test Scores*	*Mean*	*t value*	*p-value*	*Decision*	*Remarks*
Competency Level of Grade 8 Students	Pre-Test	38.33	-6.191	0.000	Reject Ho	Significant
	Post-Test	46.83				

Note: "If p value is less than or equal to the level of significance (0.05) reject Ho, otherwise failed to reject Ho."

According to the data shown in Table 2, the statistical analysis yielded a p-value of 0.000 and a t-value of -6.191. Subsequently, the mean score for the pre-test group was determined to be 38.33, while the post-test group had a mean score of 46.83. The results indicate a significant difference between the pre- and post-test groups' scores on the evaluation assessment. Consequently, the null hypothesis was deemed rejected. The analysis indicated that there is a significant difference between the two groups. The study of Abdulkareem (2020) determined that every student has their own learning capacity that the instructors cannot control. However, the most vitally significant instruments for teaching and learning that make it possible to carry out one of the most challenging biology teaching components are instructional videos. Thus, teachers can validate the relevance of the subject they are teaching their students and provide extra explanation by using instructional resources.

Part III. Effectiveness in Improving the Level of Competency on Selected Topics in Biology by the Grade 8 Students at Satriwithaya School in Bangkok, Thailand

Table 3. *Result of Effectiveness in Improving the Level of Competency on Selected Topics in Biology by the Grade 8 students at Satriwithaya School in Bangkok, Thailand*

Percentage of Marks	*Competency Level*	*Frequency (Pretest)*	*Percentage (%)*	*Frequency (Post-test)*	*Percentage (%)*	*Gain (Effectiveness)*
91 and above	Outstanding	0	0.00	16	26.67	+16
81 to 90	Excellent	5	8.33	11	18.33	+6
71 to 80	Very Good	13	21.67	13	21.67	0
61 to 70	Good	17	28.33	12	20.00	-5
51 to 60	Fair	17	28.33	5	8.33	-12
41 to 50	Below Average	7	11.67	2	3.33	-5
Below 40	Failed	1	1.67	1	1.67	0
	Total	60	0.00	60	100.00	
Mean	46.83				46.83	
SD	9.33				9.33	

Table 3 shows the efficacy of the student participants in enhancing their proficiency in several biological topics. Based on the collected data, it can be inferred that among the 60 participants, constituting the entire sample size of 100%, there was a noteworthy improvement in competency levels. Specifically, the initial pre-test scores, which registered at 0%, experienced a significant increase of 26.67%.

It is important to acknowledge that the intervention demonstrated enhanced efficacy with the inclusion of 16 more participants for the outstanding competency level and additional 6 for those who attained the excellent competency level as seen from the post-test results. The decrease in the frequency of those who are in the competency levels good, fair and below average implies the gain in the higher competency levels. In contrast, the individual who failed obtained scores within the lowest range. Hence, this chart additionally illustrates the efficacy of utilizing video-based instructional materials to enhance proficiency in specific biology subjects.

Furthermore, the findings substantiate that the utilization of video-based instructional materials can effectively enhance pedagogical and educational outcomes in the field of biology. The study of Beltran (2021) revealed that a significant difference exists among students' perceptions of the effectiveness of video presentation when grouped according to their academic level. Furthermore, it is revealed that the level of effectiveness of video presentation to students learning is highly effective.

Test of Normality of Pre and Post Test

Table 4. *Result of Normality Test using Shapiro Wilk W-Test*

Indicator	*Test Scores*	*Sample Size*	*p-value*	*Remarks*
Competency Level of	Pre-Test	60	0.728	Normal
Grade 8 Students	Post-Test	60	0.050	Normal

Note: "If p value is greater than or equal to the level of significance (0.05) NORMAL, otherwise NOT NORMAL."

According to the findings presented in Table 4, the p-value obtained from the pre- test analysis is 0.728, which exceeds the predetermined significance level of 0.05. Therefore, it is deemed appropriate to classify the result as being within the normal range.

The p-value obtained from the post-test analysis is found to be consistent with the predetermined significance threshold of 0.05, indicating a normal distribution. Therefore, the normality test conducted on both groups yielded normal results.

Part IV. Proposed Enrichment Programs Based on the Finding of the Study

The enrichment program aims to ensure that no student has difficulty learning and understanding selected topics in biology concepts such as body structures, the respiratory system, and the circulatory system, which may also assist learners in building a better degree of learning competency. Furthermore, videos are wonderful as additional learning resources. They not only alleviate cognitive strain but also hold the attention of the viewer and increase student involvement. Unlike text or infographics, video content may help portray numerous aspects of a scientific topic, providing a more interesting and engaging learning experience. Videos have a greater recall and retention rate than images or text for an attentive and captive audience.

The study of Scheider et. al (2022) states that video can allow teachers to focus on a student's knowledge gaps and academic issues. When a need is identified, a school enrichment program will help students overcome these learning difficulties. Hence, based on the study's findings, the researcher came up with an enrichment program to help students more effectively understand the selected topics in biology.

Conclusion

Based on the findings in the study, the following conclusions were drawn: The result led to the researcher decision of rejecting the null hypothesis: There is significant difference between the use of video-based instructional material and students' level of competency in selected topics in biology for grade 8 students based on the results of the pre-test and post-test assessments.

Majority of students already possess a residual level of competence before using the video-based instructional material. However, with the results revealing an increase in their percentage of marks and therefore improvement in their competency level, it can be concluded the use of video-based materials in teaching helps in enhancing /improving their knowledge and competencies in selected topics in Biology.

Based on the study's findings, there is a statistically significant difference in scores for certain topics in the field of biology among grade 8 students before and after the use of video-based instructional materials.

The findings demonstrate that the participants showed proficiency in enhancing their skills and were more effective in enhancing the comprehension of the chosen biology topics among Grade 8 students. In summary, the findings indicate that the use of video-based instructional resources has positive outcomes for enhancing pedagogical and educational outcomes within the domain of biology.

The results also demonstrated that the normality test, which was performed on the same group before and after utilizing the video-based teaching method, produced and remarked on normal results.

The findings also suggest a feasible enrichment program that might be used in the teaching method by the school to further increase the learning competency of grade 8 students who are learning biology concepts.

The researcher arrived at the conclusion that the use of video-based teaching materials as an instructional strategy in the field of biology resulted in a more effective learning experience for students. This approach affords students the chance to enhance their comprehension through interactive engagement and foster their creativity, thereby facilitating enhanced educational outcomes. Additionally, cultivating a favorable learning atmosphere that is enjoyable for students might facilitate their learning process. On top of that, this approach facilitates the teacher's ability to effectively communicate their desired comprehension outcomes to their learners. Moreover, it serves as a commendable manifestation of innovative teaching methodologies.

In view of the revealed findings and drawn conclusions, the researcher arrived at the following recommendations: Based on the finding on the study, it is recommended to school administrators to integrate the video-based instructional material as part of the learning process of the learners. School administrators may be encouraged to design programs to increase students' academic achievement and to educate students on how to use video-based educational materials. They can also normalize the use of video-based educational tools to help students learn and perform better in school.

Educators may be encouraged and inclined to adopt the use of video-based instructional materials in their teaching practices, as it serves as a means to enhance their pedagogical efficacy and foster creativity in their instructional approaches.

It is highly recommended for students to recognize and practice using video-based learning tools. This is because these tools can be incredibly useful in helping students become more comfortable, motivated, and confident in their learning. In addition, utilizing video-based learning can also lead to improvements in classroom behavior and overall academic performance.

It is recommended for future researchers to test the effectiveness of the video by creating another video-based material or topic and see whether the result of the study is the same. Furthermore, it is also recommended that future researchers undertake comparable investigations in order to enhance their understanding of this subject matter. This study proposes to serve as a valuable resource for future researchers seeking to expand their understanding and insights in the domain of video-based instructional tools within the context of Biology education.

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