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Enhancing Grade Seven Learners' Academic Performance in Biology through Virtual Museum

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ABSTRACT

The study investigated the effects of Virtual Museum (VM) on the academic performance of learners and their attitude towards its use in Grade 7 Biology. This was conducted in Managok National High School, Division of Malaybalay City during the second quarter of the school year 2017-2018. The study utilized pretest-posttest nonequivalence static group comparison, quasi-experimental research design. Two intact classes served as the participants, of whom 30 learners from one class were assigned as the experimental group using Virtual Museum as the teaching approach and 30 learners from the other class were assigned as the control group using the conventional approach (with K to 12 Science Learning Modules). The participants were matched according to their first grading grades in science. The developed Virtual Museum lessons for the study include the following topics: Levels of Organization, Microscopy, Animal and Plant Cell and Microorganisms (fungi, protists, and bacteria). The lessons were assessed and evaluated by a panel of experts. A validated research-made academic performance test was administered as pretest to both groups before the treatment. After the groups were taught with the chosen topics, posttest was administered to both experimental and control groups. An attitude scale adopted and modified from Ocier (2008) was also used in the study. The data were treated with mean, standard deviation and Analysis of Covariance (ANCOVA) at 0.05 level of significance. The findings revealed that the level of academic performance of Grade 7 learners in the experimental group who were taught using VM is higher compared to the learners in the control group taught using the conventional method. There was a significant difference in the academic performance between the experimental group and control group in favor of the experimental group. Those learners in the experimental group had a high preference on the use of Virtual Museum in the teaching of Biology.

KEYWORDS: *Virtual Museum, quasi-experimental research design, learners' academic performance, learners' attitude, pretest, posttest*

INTRODUCTION

Virtual Museum (VM) is a computer-based programmed instruction that utilizes multimedia in teaching and learning. It is an interactive technology that combines information and multimedia to modify traditional learning style and learning environment by assisting the learners to visualize abstract concepts, to observe phenomena at atomic or planetary scales, visit distant places and interact with events and if time or safety factor are unavailable (Abdelaziz, 2014). VM also utilizes interactive tools that incorporate and uses computer

technology via videos, electronic texts, graphics and moving images in teaching (Condie & Munro, 2007). The increasing concern for 21st-century learning and teaching has heightened the need to develop such computer-based instruction to meet the needs and interest of the present learners. As an innovative teaching pedagogy, virtual museum enables the learner to be more involved in the learning process, is found to increase learners' academic performance; develops problem-solving skills; promotes current academic perspective for better mastery,retention, and generalization of concepts through active involvement and hands-on learning environment in the construction of knowledge (Özmen, 2008).

Virtual museum development gives rise to new teaching and learning facilities. This innovation was purposely designed to help addressthe prevalent problems of the schools in the country regarding the low academic performance of the learners, specifically in the National Achievement Tests (NAT) and in the Science subject. For the last three years of NAT, the learners of Managok National High School obtained low mean percentage scores in Science with the following ratings: 61.75% in SY 2012-2013; 75.93% in SY 2013-2014; and 64.73% in 2014-2015. The ratings were mostly below the 75% baseline or passing score set by the Department of Education. The low academic achievement of the learners can be attributed to several factors like learner's poor study habits, financial problems, lack of interest in learning the subject, lack of instructional materials, inappropriate teaching strategies and ineffective use of teaching approaches. It can also be attributed to teacher factor such as resistance to the use of technology and innovative strategies.

The department of education implemented and utilized the K-12 curriculum since 2011. This curriculum uses the spiral progressive approach in which the concept and skills are taught in Biological and Physical Sciences in increasing levels of complexity. The new curriculum is learner-centered which uses inquiry-based, constructivist, reflective, collaborate and technological integrated pedagogical approach to developing scientific and technologically literate Filipino leaners in the 21st century (Idulsa, 2017). Furthermore, this 21st-century educational system emphasizes the use of modernized pedagogy, multimedia generated instructional materials as well as information and communication technology driven instructions (Gabales, 2017), to suit to the 21st-century learners. The learners of today are called digital natives (Torrente et al., 2010), which means these are learners that are used to interactive digital media such as computers, mobile devices or video game. They have high modern technological demands and needs due to their new kind of lifestyles which revolves around gadgets, software, and computer applications.

Studies investigating the effectiveness of computer-based instruction were implemented for the past several years. A study conducted by Hussain et al., (2017) revealed that lessons integrated with computer technology are more effective in enhancing the academic performance of learners compared to conventional method of teaching. Enhancement in the academic performance of learners is linked with their attitude towards learning, the instructional materials, the instructional approach as well as the subject (Cheung, 2009). Furthermore, the study of Shah and Khan, (2015) posited that computer-based instruction through multimedia-aided teaching enhances learner's academic performance in science due to their positive attitude towards the use of CBI. A related result was observed in the study of Bayrak, et al. (2007) when they compared computer-based instruction with other teaching approaches aside from the traditionalmethod; it was found out that computer-based

instruction is as effective as hands-on activities used by the teacher in teaching. The cited studies established positive viewpoints on the use of computer-based instruction.

The problems concerning the decreasing interest of the learners to learn; their new learning styles; the required learning approach by the K to 12 curriculums for the development of the 21st-century skills and the attendance of the researchers to various trainings, seminars, and workshops on ICT lesson integration fueled the conceptualization and the conduct of this study. The study focused on the effectiveness of the developed Virtual Museum Lessons on the academic performance and the attitude of Grade 7 students on its use in the teaching of Biology concepts.

The study is anchored on the Theory of Multiple Intelligences by Gardner (1983), which states that intelligence exists in a number of sensory modalities (styles and abilities), rather than as a single ability. According to Gardner (2011), the intelligence of a human being is multi-dimensional, which include Linguistic intelligence ("word smart"), Logical-mathematical intelligence ("number/reasoning smart"), Spatial intelligence ("picture smart"), Bodily-Kinesthetic intelligence ("body smart"), Musical intelligence ("music smart"), Interpersonal intelligence ("people smart"), Intrapersonal intelligence ("self-smart") and Naturalist intelligence ("nature smart). Each dimension represents a different way of thinking, problem-solving and learning (Armstrong, 2014).

Another theory which the study is hinged on is the Cognitive Theory of Multimedia learning by Mayer (2009) who posited that people learn better from multimedia instructional messages when they are designed in ways that are consistent with how the human mind works. According to Mayer (2001), the learner attempts to build meaningful connections between words and pictures and they learn more deeply than they could have with words or pictures alone. He further added that people learn better from a multimedia lesson when they know already the names and characteristics of the key concepts. He also stated that humans engage in active learning by attending to relevant incoming information, organizing selected information into coherent material representations and integrating mental representatives with prior knowledge. In this study, multimedia is integrated in the development of Virtual Museum Lessons for Biology.

Statement of the Problem

This study investigated the effects of Virtual Museum on the academic performance in Biology of Grade 7 Learners at Managok National High School during SY 2017–2018. Specifically, this study sought to answer the following questions:

1. What is the academic performance of Grade 7 learners in Biology taught using Virtual Museum and those learners taught using the Conventional Method?

2. Is there a significant difference in the academic performance of Grade 7 learners in Biology taught using Virtual Museum and those learners taught using the Conventional Method?

3. What is the attitude of Grade 7 learners towards the use of Virtual Museum in teaching Biology?

METHODOLOGY

This study employed a pretest-posttest nonequivalence static group comparison, quasi-experimental research design. Two intact classes of Grade 7 learners were randomly chosen from the grade 7 sections; one class was assigned as the control group, and the other class as the experimental group. The consent of the learners to be the participants of the study was given consideration. From each group, 30 learners served as the participants of the study and were matched based on their first grading grade in science.The experimental group was taught using virtual museum while the control group was taught using the conventional method (K-12 Science Module).

The development of the Virtual Museum lessons adopted the ADDIE model by Seels and Glasgow (1997) and as modified by Simbulan (2004). It involves three stages of the development, namely, pre-development (planning and design); development (writing and making of VM); and post-development stage (the validation stage).A researcher-made performance achievement test was also used in this study. It has undergone validity and reliability test. It was then used as pretest and post-test to both groups to assess their academic performance in Biology. The post-test results of the two groups were compared using ANCOVA at 0.05 level of significance. The researcher also employed an adopteda 30-item attitude scale (Ocier, 2008) to determine the level of attitude of the learners towards the use of virtual museum in Biology.

The study was conducted at Managok National High School of District 9, City Division of Malaybalay in SY 2017-2018. The school is under the supervision of the Department of Education which implements the K-12 Curriculum. It is located at Barangay Managok along the National Highway, approximately 20 kilometers East of Malaybalay City.

The data were treated with appropriate statistical tools for analyses. Mean and Standard deviation were used to answer problem 1 and 3, while analysis of covariance at 0.05 level of significance was used to answer problem 2.

RESULTS AND DISCUSSION

Academic Performance in Biology of the Grade 7 Learners

Table 1 shows the result of the pre-test and post-test scores between experimental group (taught using Virtual Museum) and control group (taught using conventional method). It reveals the overall academic performance of the control and experimental groups before (pre-test) and after teaching (post-test).As shown in Table 1, both the experimental and the control group were on the same performance level of "Did Not Meet Expectation" (DNME), as indicated by their pre-test mean scores. Their pretest scores showed that both groups are at par with each other.

The result may be due to the lack of knowledge of Grade 7 learners on the topics about Levels of Organization, Microscopy, Animal and Plant Cell, and Microorganism (fungi, protists, and bacteria). According to Mayer (1996), learning is an active process based on prior knowledge. Moreover, Mayer (2009) emphasized the importance of learning based on the testing of content and demonstrating the successful transfer of knowledge when new information is integrated with prior knowledge.

However, as shown in their post-test mean scores, the experimental group has higher mean scores compared to the control group. The mean scores of the post-test indicated that the performance level of the experimental group is "fairly satisfactory" (FS). This means that the grade seven learners taught using Virtual Museum had developed the minimum fundamental knowledge, skills and core understanding about the Levels of Organization, Microscopy, Animal and Plant Cell, and Microorganism (fungi, protists, and bacteria); the learners only need little guidance from the teacher and some assistance from peers; they can also transfer this understanding through authentic performance task.

Table 1. Profile of pretest and post-test frequency distribution between the experimental group and control group

Legend: *DNME*=Did Not Meet Expectation; *FS*=Fairly Satisfactory

Level of Proficiency	*Range of Scores*	*Experimental Group*				*Control Group*			
		Pretest		*Posttest*		*Pretest*		*Posttest*	
		F	*%*	*F*	*%*	*F*	*%*	*F*	*%*
Outstanding	*27-30*	*0*	*0%*	*2*	*7%*	*0*	*0%*	*0*	*0 %*
Very Satisfactory	*24-26*	*0*	*0%*	*3*	*10%*	*0*	*0%*	*0*	*0%*
Satisfactory	*21-23*	*0*	*0%*	*4*	*13%*	*0*	*0%*	*4*	*13%*
Fairly Satisfactory	*18-20*	*0*	*0%*	*10*	*33%*	*0*	*0%*	*6*	*20%*
Did not meet expectation	*0-17*	*30*	*100%*	*11*	*37%*	*30*	*100%*	*20*	*67%*
$\bar{x}$		*7.80*		*18.63*		*7.37*		*15.27*	
Performance Level		*DNME*		*FS*		*DNME*		*DNME*	
Sd		*2.59*		*4.44*		*2.16*		*3.35*	

Table 1 also shows the profile of the learners' distribution of the frequency of their post test scores in both experimental and control group. As reported in Table 1, there were 7% of the learners from the experimental group who attained the highest level of academic performance which is "Outstanding" and 10% from this group attained the "Very Satisfactory" level. On the other hand, no learner from the control group managed to reach the said levels. Thirteen percent of the learners from both groups reach "Satisfactory" level, 33% of the learners from the experimental group is in "Fairly Satisfactory" level while in the control group only 20% attained this level. Looking at the lowest level of proficiency which is "Did Not Meet Expectation", it was observed that many of the learners from the control group are on this level, which comprises 67% as compared to only 37% of the learners from the experimental group.

The said differences in the frequency distribution in favor of the experimental group may be attributed to the features of the Virtual Museum (VM) Lessons. One feature of the VM Lessons that made the learning of the learners more concrete is the presence of the video. Every lesson in the VM contains videos with corresponding guide questions. For example, in

the topic on the levels of organization, the learners had learned substantially from the video since there is a thorough explanation of the differences of each level from lowest to higher levels. For example, the video explained the difference between tissues and organs in terms of what they are made of, that a tissue is made of the same type of cells while organs are made of different tissues. Each level has visuals for learners to see and differentiate lower levels from higher levels.

Through the video, learners had also learned the different organ system in the human body as well as their components. The video presented and explained further the different organelles of the cell and their specific functions. An example is the explanation of mitochondria's parts and function. The video elaborated through an animation that mitochondria are parts of the cell that supply its energy and it has several important parts like the matrix and the cristae which function for energy production.

Furthermore, the guide questions posted during their viewing of the video helped them construct their own meaning of the concepts from the video presentation, aside from correcting their misconceptions (Resmeros, 2016). According to Lawson et, al. (2007), learning associated with videos increases when teachers use guided or structured questions. In addition, the findings of Jonas (2012) in his study supported this claim and emphasized that using video can help increase learners' academic performance in Science.

Learners in the experimental group learned the lessons using virtual museum and they were exposed to different activities utilizing the different forms of multimedia including text, videos, sounds, pictures, and graphics. According to Mayer (1997), multimedia learning occurs when information is presented in more than one mode. It could be through pictures, words spoken or written, or through video. Garnett et al. (1996) added that multimedia provides the learners with access to a rich information source and appropriate activities to promote learning and understanding.

During the conduct of the study, it was observed that the learners in the experimental group are more motivated and interested to learn the prepared lessons through Virtual Museum since they have independently accessed and experienced the lesson. According to the Dewey and Vygotsky's, constructivist theory, i.e., when the learners interact with the environment they start to gain knowledge and understanding; the learner then constructs his/her own thoughts and finds solutions to problems independently (Hyslop-Margison &Strobel, 2008).

The researchers also observed that learners tend to learn new concepts and topics faster with VM. It was seen during the lesson that more learners finish the activities quickly and accurately that even before the allotted time they are already done answering the formative assessment embedded in the VM, correctly. As cited by Capper and Copple (1985), CAI users sometimes learn as much as 40 percent faster than those receiving traditional, teacher-directed instruction.

Furthermore, it was observed that learners retain information and content longer. As observed, even if the post-test was given to them four days after the last day of their lesson due to declaration of holidays, they still managed to get high scores in their performance achievement test. Some learners can still sing the songs regarding the topics they had learned which is one of the activities of the VM Lesson.

The given results are supported by Mayer's theory which states that animated content combined with text and pictures allow the learners to build psychological representation actively, so they could recall their memory easier when answering questions, and the effect of long-term memory could be better (Jones & Plass, 2002). According to Vaughan, (2003) when students are allowed to interact with the multimedia applications, learners' retention rates are improved. In addition, when a student access multimedia learning module, their senses are stimulated and their attentions are captured, due to this, it contributes in increasing their retention rates (Li, Mai, & Tse-Kian, 2013). Oncu and Cakir, (2011) also asserted that multimedia enhances the retention of the learned content by the learners leading to an improved learners' academic performance.

When the learners from the experimental group are asked to make a journal regarding their impression on the use of Virtual Museum in their lessons in Biology they had stated that "*virtual museum helps us understand the topic better since there are videos where we can see detailed explanation of the topics and concepts that we need to learn*". Another notable statement by one of the learners in the experimental group indicating better learning with VM is "*learning topics in biology is easy since virtual museum had helped me visualize, recognize and comprehend abstract topics in Biology*".

A study conducted by Ercan (2014) obtained the same result with the present study when he examined the effects of multimedia learning material on Learners' Academic Achievement and attitude towards Sciences courses. The result of this study implied a statistically significant difference between the post-test achievement scores of the experimental and the control groups, with the experimental group scoring higher.

Results also show that the mean score of the control group taught using the conventional method indicated that the learners under this group were still in "did not meet expectations (DNME)" level, even though a slight increase in their post-test scores was observed. This means that the control group struggles with understanding; prerequisite and fundamental knowledge or skills had not been acquired or developed adequately to aid understanding on Levels of Organization, Microscopy, Animal and Plant Cell, and Microorganism (fungi, protists, and bacteria). As observed, the learners in the control group were passive learners. They mostly depend on the information that the teacher provided them.

According to Ambrose et al., (2010) conventional model of teaching is a kind of teaching approach that gives learners direct and explicit instructions to learners rather than having students explore on their own making the learning process less effective and dull. Even if activities are already been given to them to capture their interest in the subject, they still find it unexciting and boring. This may be because of the fact that they are very used to this monotonous kind of approach that it could not stimulate and motivate them to learn anymore.

Comparison of the Academic Performance between the Grade 7 learners in the control and in the experimental group.

In order to determine the significant difference on the academic performance in biology between grade 7 learners in the experimental groups and control group, one-way analysis of covariance (ANCOVA) was used at 0.05 level of significance. Table 2shows the comparison of the learners' academic performance taught using VM lessons and those students taught using the conventional method. As indicated in the p-value, the result shows that the use of

VM in the experimental group significantly improved the learners' academic performance compared to the control group.

Table 2. ANCOVA Summary Table for the Comparison of the Academic Performance of Grade 7 Students in Biology

Source of Variation	Sum of Square	Df	Mean Square	F-value	P-value
Intercept	1754.745	1	1754.745	5.809	0.000
Pretest	10.604	1	10.604	112.86	0.412
Group	176.448	1	176.448	0.682	0.001
Error	886.23	57	15.548	11.349	
Total	1066.85	60			

The ANCOVA summary of the results of Grade 7 learners is shown in Table 2. The p-value which is 0.001 is below the alpha level which was set at the p=0.05 level of significance. This indicates that there is a significant difference between the experimental group and the control group. It further implies that there is a significant difference in the gain scores in the academic performance test in biology between Grade 7 learners taught using VM lessons and those learners taught using the conventional method, in favor of the experimental group. The result of the post test favoring the experimental group may be attributed to another feature of the VM, the use of graphics and text aside from the use of videos. Each of the lessons using the virtual museum includes graphics in the form of pictures regarding the selected topics with their descriptions, definitions, and functions in the form of text.

As observed by the researchers, the use of pictures together with text had improved the learners understanding on the selected topics in Biology. With these features, learners can easily differentiate the levels of biological organization; they can also point out which organs belong to which organ system; they can identify the different organelles of the cells and their specific functions; they can also recognize the parts of the microscope and give examples of microorganisms. Mayer (2001) posited that learners learn more deeply using words and pictures combined together than they could have with words and pictures alone. He proposed that text has the most impact on the quality of multimedia interaction as it provides the important information and acts as the keystone tying all multimedia elements together. He also added that the capacity of recognition memory for pictures is almost limitless since images use a massive range of cortical skills.

The above result supports the statement of Vyas (2013) on the incorporation of multiple media into an application. She emphasized that multimedia could activate more senses that would encourage users to embrace, internalize, and learn more from information because users can attack the information from multiple directions making the learning process more effective. Adegbija, (2010) added that instructional media supplements and aid classroom teaching. Moreover, Fakomogbon and Adegbija, (2012) confirmed with the idea that for teachers to convey the ideas, information or skills efficiently, as well as to prevent misunderstanding they should use the most appropriate instructional media to actively engage the students' senses. The study of Nwike and Catherine (2013) asserted that instructional media helped learners performed better during classroom instruction.

Another reason that can be cited relating to the effectiveness of the use of VM compared with that of the conventional method is that it follows the multimedia learning principles. As a

form of multimedia approach, it caters the different needs of the learners as it is designed to address the learners multiple intelligences, through differentiating instructions and activities given to the learners. Combining the concept learned from multimedia learning theory, the theory of multiple intelligences and differentiated instruction can lead to the enhancement of learner's academic performance.

Numerous studies that claim a positive impact of applying the above-mentioned theory and approach had proved their effectiveness. The study of Baş & Beyhab, (2017) on the effects of multiple intelligences supported project-based learning and traditional foreign language-teaching environment on learners' achievement and their attitude towards English lesson, was one of them. They revealed that the learners who are educated by multiple intelligences supported project-based learning method are more successful and have a higher motivation level than the learners who are educated by the traditional instructional methods.

Generally, the recent study revealed that VM lessons can enhance better the learning of students than the conventional method of teaching. As an instructional material and a teaching approach, it proves to enhance the learning of the learners. The result of this study defies the claim of Ravenel et al. (2014) when they compared computer-based instruction with other teaching instruction besides the traditional. They found that computer-based instruction is as effective as hands-on activities used by the teacher in teaching. Furthermore, it doesn't support the assertion of Da'lij (2008), in his study on the effect of using Mathematics software on second-grade intermediate female students' academic achievement in Riyadh. He postulated that there are no statistically significant differences in the significance level of 0.05 between the experimental and control groups.

Attitudes of Grade 7 students towards the use of Virtual Museum in teaching Biology

To determine the attitudes of grade 7 learners towards the use of VM in teaching Biology, an attitude scale adopted from Ocier (2008) was given to the learners in the experimental group. Generally, those learners in the experimental group developed a favorable attitude towards its use. This indicates that the learners found the use of VM in Biology satisfying.

Based on the commonalities of the responses of the learners to the attitude scale, most of them preferred the use of VM in Biology. There were learners who have very high preference on the use of VM since "*they can easily understand the topics in biology using the said approach"* and also because *"the lesson can be understood better with the use of multimedia, such as videos, sounds, graphics and animations"*. Most of the learners have high preference on the use of VM. Some reasons they have given are "*they can easily acquire information accurately and briefly when it uses virtual museum; when virtual museum is used in the class it developed their ability to be more participative;* and *they understand the lessons thoroughly and systematically through virtual museum".*

As, observed, the use of multimedia can help the learners learn concepts in Biology since most of them are visual learners. The result further suggests that when VM is used, learners acquire information briefly and accurately; they can also understand the lessons thoroughly and systematically making them more participative in class. In addition, they don't feel sleepy and bored when the topic in biology is made more challenging using VM.

While most of the learners appreciated the use of VM on their subject biology there were few learners who have neither high nor low preference towards its use. Some of the reasons they

have cited are - "*they cannot read and understand some illustrations made/ used in the virtual museum"*; and "*they feel bored when the presentation uses only one instructional tool"*. They are still undecided towards the use of VM on their subject Biology since they feel that "*even if the presentation is very well done through virtual museum their attention is not greatly caught by it"*.

As observed, during the conduct of the study most learners find it easy to comprehend the lessons in biology with the aid of multimedia such as videos, sounds, graphics, and animations present in the VM. Looking at the learners, the researchers observed their excitement in learning the lesson of the day, as manifested by their eagerness to get inside the computer laboratory and to get started with the lessons. They are also more attentive and focused in the class. They are not even talking with their seatmates because they are busy operating the VM. The learners also enjoyed the lesson presented in different multimedia formats as shown by their excitement and smiles while they are using the VM on their computers.

As indicated in the feedback of the learners on the use of VM in Biology in their submitted journals, the researchers found out that most of the learners enjoyed their science class. One learner stated that he enjoyed the lessons in biology through VM because of the videos which use cartoon characters just like his favorite anime series. For example in the lesson on the levels of organization a cartoon character explains the functions of each of the organ system in animals and plants. Another learner said that he doesn't get bored and sleepy during the class because he is busy manipulating the computer watching videos, listening to music videos and scanning pictures of the lessons that he needs to learn.

The findings of the present study support the claim of Njoki (2014) that the utilization of instructional media would reinforce learning, motivate learners and make learning real. Guanzon (2017) believed that enjoyable and fun activities could heighten learner's interest even if they find some lessons hard. In addition, Bennett (2001) posited that the development of a positive attitude of learners towards science was a result of their experiences in different learning environments in the field of science education. Cheung (2009) inferred that it is important for the learners to develop a positive attitude since attitude is linked with academic performance.

Luo and Yang's (2016) study on the effect of the interactive functions of whiteboards (IWB) on elementary learners' learning also evaluated learners' learning attitudes in relation to the use of multimedia is also supported with the current study. Their findings showed that teachers' use of the IWBs' basic interactive function helps learners develop positive learning attitudes, including enjoyment of learning, the usefulness of IWB, and willingness to learn. Moreover, the students' personal experience operating the IWB had an effect on their enjoyment of learning and willingness to learn. All these tools being used in VM may have contributed to the enhancement of the students' academic performance in Biology.

CONCLUSIONS

Based on the results and findings of the study, the following conclusions were derived:

1. Grade seven learners taught with VM lessons have a "*Fairly Satisfactory"* level of performance in Biology compared to the "*Did Not Meet Expectation*" level of the control

group, thus, Virtual Museum can help develop the minimum fundamental knowledge, skills, and core understanding of the learners in Biology.

2. There is a significant difference in the academic performance between learners who were taught with the use of Virtual Museum and those learners taught with the use of conventional lecture method, in favor of the experiment group, hence Virtual Museum is an approach that can enhance the academic performance of grade seven Biology students.

3. The favorable attitude of learners in the experimental group indicates their high preference on the use of Virtual Museum in learning Biology.

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