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WEB-BASED ADVANCED TEACHING (WEBAT): A STRATEGY TO INCREASE THE ACADEMIC ACHIEVEMENT AND STUDY SKILLS OF GRADE 9 STUDENTS IN SCIENCE

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Abstract:

The K to 12 Science Curriculum aligned with the Department of Education vision - mission ensures that the student's educational experience is relevant and forward-looking. This study was undertaken to establish the effectiveness of the Web-Based Advanced Teaching (WEBAT) Strategy in increasing students' achievement and study skills in science 9. A quasi-experimental research design was used involving one intact class. This study was conducted for a period of six (6) weeks during the 4th quarter of the 2020-2021 school year at Muntinlupa Business High School – Main (MBHS-Main). Purposive sampling was applied to select the 48 Grade 9 students for this study (24 were the control group and 24 were the experimental group). It utilized two research instruments. The data gathered were interpreted quantitatively and qualitatively. The study's findings revealed a significant difference in the students' achievement mean scores before and after their exposure to Web-Based Advanced Teaching (WEBAT) Strategy and a significant difference in the students' study skills mean scores before and after their exposure to Web-Based Advanced Teaching (WEBAT) Strategy. Hence, it was concluded that the Web-Based Advanced Teaching (WEBAT) Strategy as a teaching-learning strategy had improved students' achievement and study skill in science 9. The evidence-based on the gathered data of Mean of Control Group and Experimental Group using paired t-test showed that both groups of respondents increased their academic achievements based on the post-test result in science 9, however, the experimental group of

respondents who underwent and experienced the Web-based advance teaching (WEBAT) got the higher increase in academic achievement and study skill over the students who exposed only to the module.

Overall, this strategy is created not to compare or compete with the existing modules provided by the Department of Education- SDO Muntinlupa but to help the educators/Teachers to make a better way to help the students to have a good grade even there's a lot of unreturned and returned modules with no answers during this pandemic.

Keywords: *Web-based advanced Teaching, Academic achievement, and Study skills.*

Introduction

COVID 19 strikes the Philippines at an unexpected time and day that caused adverse changes in the different fields of work, including the field of education. However, in this time of agony, all educators are still pursuing their eagerness for the learners to find hope and inspiration in making this school year 2020-2021 more productive and meaningful amidst these trying times.

The Muntinlupa Business High School-Main S.Y 2020-2021 as well as the entire bureaucracy has begun to use the self-learning modules (SLMs) and other alternative delivery modalities during the pandemic including the distance learning modality to continue the distance learning process for all the students. In Deped.gov.ph (2020), DepEd Secretary Leonor Briones said that the use of SLMs and other alternative learning delivery modalities during this pandemic are in place to address the needs and resources of each learner and will cover all the bases in guaranteeing that basic education will be accessible and flexible amid the present crisis posed by COVID-19.

As provided in Deped Memorandum DM-CI-2020-00162 issued by the Office of the Undersecretary for Curriculum and Instruction dated July 1, 2020, the SLMs are designed to provide ample time for the mastery and sufficient practice to ensure, certify and protect that the targeted Most Essential Learning Competencies (MELCs) are attained.

As provided in the Memorandum DM-CI-2020-000 issued by the Office of the Undersecretary for Curriculum and Instruction dated May 6, 2020, teachers shall be tasked to prepare and create an activity sheet that will help the students to learn. This is harmonizing the modules for purpose of enhancement and must be anchored on MELCs.

According to Riasat Ali (2010), the strategy of learning modules has become a part of all levels of teaching. A learning module created by some educators is a self-learning package dealing with one specific subject matter. It can be used in any setting suitable and accessible to the learner and may be completed at the learner's own pace.

The modules are designed to guide and help the learners on understanding the concepts, contents, and learning the skills. However, the modules may not be sufficient to master the lessons, at the same time, some students cannot be able to return the module immediately and some of them did not answer all the questions and performance tasks in the module easily that may affect their scores or grade during the distance learning modality mode.

In addition, learners during this pandemic have become more dependable on the different sites on the internet and other social media platforms where they can easily access some of their answers in their assignment/exercises in the

modules during the distance learning in science 9 that somehow negatively affects their study skills and performance in school since they spent most of their time using it.

Also, a study conducted by Hasni (2012) revealed that study skill is somehow another contributing factor to the academic achievement of the student. A study skill includes reading textbooks, taking notes, studying, memorizing, preparing for the test, and managing time. (Kirby, 2001).

During the face-to-face classes, MBHS-Main 2018-2019 MPS results of Grade 9 Quarterly Examination, science registered the 4th to the lowest MPS among the 8 subjects with 54.41%, resulting in nearing mastery of the subject matter.

In the 2017-2018 National Achievement Test (NAT) for Grade Six and Grade Ten results and analysis published by Division of City Schools of Muntinlupa-DepEd Bureau of Education Assessment. Among the six major subjects in Grade 6, science registered the lowest MPS with 33.71% in Muntinlupa, 33.06% in NCR, and 29.05% in National. However, in the Grade 10 Junior High School, science registered in the 2nd to the lowest MPS in Muntinlupa with 36.06%, NCR with 39.23%, and National with 36.52%. This data shows that learners show low performance in a science subject.

The said concerns led the researcher to consider a strategy that could involve learners and teachers' interactions and allow the learners to invest time in the reading outside the class hours and make another way for the students to have a good grade and increase their performance in science 9 even there's a lot of unreturned and returned modules with no answers during the distance learning modality mode.

The strategy Web-Based Advanced Teaching (WEBAT) comes up as a strategy used for this research to sustain the interest of the students and to continue the learning process that will surely increase and help the students to attain a good academic achievement and develop strong study skill through advance Web-Based assignment /exercises via different Web-tools.

This strategy is created not to compare with the existing modules provided by the Department of Education (DepEd) – SDO Muntinlupa but to help the educators/teachers to make a better way to help the students during these trying times to have a fair and a good grade even there's a lot of unreturned and returned modules with no answers during this pandemic.

This research adopted the general system 's theory of "Constructivism" by Jean Piaget (1896–1980). The theory generally states that, through processes of accommodation and assimilation, individuals construct new knowledge from their experiences. When individuals assimilate, they incorporate the new experience into an already existing framework without changing that framework. This may occur when individuals' experiences are aligned with their internal representations of the world but may also occur as a failure to change a faulty understanding.

To sum up, the onset of the COVID-19 pandemic has greatly impacted all forms of social activities globally, including traditional classroom activities "face-to-face" across all levels of instruction from kindergarten to university. While online learning has been an active subject of research and discourse during the pandemic days, the onset of the pandemic has suddenly created an immediacy to such means of course delivery. This makes gap and tension in terms of effective and engaging content delivery mode, where traditional modes of synchronous

content delivery are now forced to be brought online. Consequently, with the Department of Education continuously adapts to the new landscape of teaching and learning, this study hopes to adhere to the Learning Continuity Plan (LCP) of the aforementioned that stipulates that student do not have to be inside a classroom in the new normal. It is also emphasized that it will not necessarily mean that teachers and learners will undergo the traditional in-classroom setup. It is for this reason that the researcher came up with incorporating Web-based Advanced Teaching (WEBAT) as the strategy to increase the academic achievement and study skill of grade 9 students of MBHS-Main in the distance learning modality in the new normal.

Statement of the Problem

This study intends to assess the effect of Web-based Advanced Teaching (WEBAT) as a strategy to increase the academic achievement and study skill of Grade 9 students of MBHS, SY 2020-2021.

The researcher specifically sought to answer the following:

1. Is Web-Based Advanced Teaching (WEBAT) Strategy effective in increasing students' academic achievement and study skill in science 9 before and after the intervention?
2. What are the study skill and academic achievement of the students before and after the intervention?

- Experimental group
- Control group

Hypotheses

This study ordeal the null hypothesis below:

Ho: There is no statistically significant difference between the results of scores in pre-test and post-test of the students exposed to Web-based advance teaching (WEBAT) Strategy and students exposed to DepEd's modules.

Ho: There is no statistically significant difference between the results of scores in post-test and study skill of students exposed to Web-Based Advanced Teaching (WEBAT) strategy and students exposed to DepEd's module.

Conceptual Framework

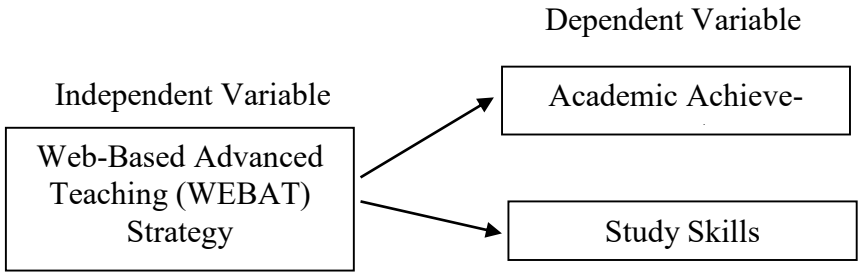


Figure 1. Research paradigm

The research paradigm illustrated the potential link of Web-based advanced teaching (WEBAT) on the academic achievements and study skill of the Grade 9 students of MBHS in science 9 subject. The Independent Variable is the WEBAT strategy, and the Dependent Variables are academic achievement and study skill.

Scope and Delimitation of the Study

This study utilizes the quantitative quasi-experimental research design to show the data in a narrative-tabular format and quantitative quasi-experimental research design using pre-test and post-test to present the tables and describe the findings and analyze quantitatively. The sampling technique used will be purposive sampling. The research study primary focus is to assess the effect of Web-Based Advanced Teaching (WEBAT) as a strategy to increase the academic achievement and study skills of the Grade-9 students of Muntinlupa Business High School -Main in science 9, S.Y. 2020-2021.

The participants of the study were the cluster one with six (6) sections composed of three hundred thirty (330) students, but only one intact class would be the subject of the study. This section is composed of forty-eight (48) students but only twenty-four (24) of them will participate in a Web-Based Advanced Teaching (WEBAT) strategy online in a form of a Web-tool which is the Google forms, and the students will be meet using Google Meet for the online discussion from Monday, Wednesday, and Friday, while twenty-four (24) of them will experience the module provided by Department of Education (DepEd)-SDO Muntinlupa.

The online classes every meeting will take 1hr (3:00 PM-4:00 PM) to finish. **T**he WEBAT exercises will be send using google forms and it will be open at exactly 1:00 PM and must be ended at exactly 2:00 PM (1hr). The window time for the researcher to review the student's responses is one (1) hour, 2:00 PM – 3:00 PM. The student-participants were chosen as the subject of the study because they enjoyed connectivity or internet connection. The control group will give a separate intervention (portfolio intervention) to have an equal opportunity to have an extra point like what the experimental group have got even they don't attend the online class in science 9.

The experimental phase of the research study was implemented for six weeks from August, September, and October of the 4th quarter S.Y 2020-2021 from Monday, Wednesday, and Friday. Tuesday and Thursday are allotted for answering the other tasks in the DepEd's modules.

Overall, this strategy is created not to compare with the existing modules provided by the Department of Education but to help the educators/Teachers to make a

better way to help the students to have a good grade even there's a lot of unreturned and returned modules with no answers during this pandemic.

Method

Research Design

The research design used for this research study is a quantitative quasi-experimental research design using pretest, posttest, and qualitative quasi-experimental research design to show the data in a narrative-tabular format. One questionnaire was used to gather the data that reflects the students' study skill in science 9 lesson.

The result of academic achievement was taken from the pretest and posttest of the students in science 9 lessons from the 4th quarter. The design was chosen because of its appropriateness to this study, which aimed at gathering facts, knowledge, opinions, and judgments from the students.

The Sample

This study engaged the quasi-experimental research design using the pretest and posttest, wherein a single intact class was given pretest, posttest, and study skill questionnaire to determine the effect of Web-Based Advanced Teaching (WEBAT) as a strategy on the students' academic achievement and study skill in science 9.

A purposive sampling technique was used to assess the effect of Web-Based Advanced Teaching (WEBAT) strategy on the academic achievement and study skill of Grade 9 students of MBHS-MAIN in science. The researcher conducted a poll survey to six (6) sections from the first cluster composed of three hundred thirty (330) students that the researcher's handled through group chat, based on the poll survey, the section Bronze handled by the researcher was the only section with

high number of respondents that was able to communicate online anytime since they already have the group-chat including their parents, so communication is always possible for this section.

The study was conducted at Muntinlupa Business High School- Main and it was participated by Grade 9 students of section Bronze composed of forty-eight (48) students. The forty-eight (48) students from section Bronze handled by the researcher were separated from two groups using "draw lots", twenty-four (24) will be the experimental group that will experience the WEBAT strategy, and the other twenty-four (24) students will be the control group of respondents that will experience the DepEd's module of SDO Muntinlupa as the subject for this research study.

Data Gathering Procedure

Web-Based Advanced Teaching (WEBAT) is a strategy involving feedback from students on the web-based pre-lecture exercises to design in-class activities/discussions online to build on the continuing feedback from students. This strategy also uses students' background knowledge to generate new and advance information using WEBAT exercises that will be sent via Google forms.

Constructivism states that learners have already their background knowledge, and they use it to generate and create new information. This theory speculates that learners build new understandings on existing attitudes, experiences, and knowledge (Kujawa and Huske, 1995).

The activities will be implemented online via Google Meet and Google forms. The activities consisted of six weeks to utter. A day before the online lesson and implementation of the strategy, the students will be met online via Google

Meet to participate in an online discussion and briefing about the online activities for the 4th quarter lessons, they will be instructed on how to use the Google Meet and how to submit their WEBAT exercises via the Google forms.

The researcher must give already the WEBAT exercises before the science online class starts, the WEBAT exercises must be connected to the upcoming lessons in the 4th quarter lesson in science that has not been discussed yet that composed of one multiple-choice question every topic that is required students to provide their reasoning for their responses, the WEBAT Exercises will be sent via Google forms through messenger. The online discussion using students' responses on the WEBAT Exercises via Google Meet will take one hour (1hr) every meeting.

WEBAT exercises are the single most important element of the Web-Based Advanced Teaching (WEBAT) strategy; these are brief, conceptual exercises that are due before lecture periods. Students must read assigned materials, and then answer several questions via Google forms in advance. The online classes every meeting will take 1hr (3:00 PM-4:00 PM) to finish. The WEBAT Exercises will be open at 1:00 PM and must be ended at exactly 2:00 PM from Monday, Wednesday, and Friday before the class starts at 3:00 PM. The window time for the researcher to review the student's responses is 1 hour via Google form. Although this period can be varied substantially, it should be short enough that the subject is fresh in the students' minds yet long enough that the researcher has time to review, analyze, validate, and read students' responses correctly, through this, the researcher will be gathered students understanding about the lesson and to eliminate those lessons that students already know or mastered (at least 1 hour).

The grading of the WEBAT exercises is also subject to the researchers' prudence. The grade of WEBAT Exercises is based on students' effort, rather than for technical accuracy. This encourages students to participate fully and is especially helpful when the WEBAT Exercises focus on lessons that are difficult or confusing. This also helps maintain student motivation. The students are resent being graded and evaluated on the material that has not yet been discussed in class.

The researcher used the students' responses on the WEBAT Exercises to create a friendly debate environment during online class to start the discussion so that online class will become more exciting, full of changing ideas and students are confident enough to answers the teachers' lessons in science 9 since the questions were given ahead of time before the class start. Adapted rubric is also used to determine if the students answered the WEBAT exercises well or not.

In addition, the strategy will be used as a guide for the students to develop their background knowledge, remove misconceptions and make them confident enough and knowledgeable enough to participate in an online class discussion in science 9. There must be a continuation of the lessons on the next day once the topic is not yet done, so the WEBAT exercises will always depend on the previous topic discussed. The flow of the discussion and the use of the strategy is administered until all topics from the 4th quarter are covered and discussed.

The data from the research study were collected during the 4th quarter of science 9 lessons from the S.Y 2020-2021 from both experimental and control groups of respondents. The forty-eight (48) students of section Bronze were separated equally based on draw lots. The control group composed of 24 students was ex-

posed to DepEd's module while the experimental group composed of 24 students was exposed to the Web-Based Advanced Teaching (WEBAT) Strategy.

According to DepEd Memorandum DM-CI-2020-00162 (2020), schools may adopt a combination of synchronous and asynchronous online teaching in consideration of the Screen Time Guidelines by Age as recommended by the American Academy of Pediatrics (AAP) and World Health Organization (WHO).

According to Esen & Gundogdu (2010), he stated that adolescence gaining social support and care from their peers is an important factor to cope with different problems, illnesses, and challenges by letting go of emotions by talking to someone. Social support plays an important role for teenagers to lessen the effects of stressful situations and stressors through the support of their peers in the group.

According to DepEd Memorandum DM-CI-2020-00162 (2020), online materials may be designed for collaborative tasks that will engage learners to work in real-time. Online tools may be used for virtual collaboration among peers. These tools can give feedback, comment, rating, and even posting grades or scores.

This study will use the following instruments to collect data: achievement test to measure the achievement of the students in 4th quarter science and study skill test questionnaire to measure students' study skill. Questionnaires were used to collect data from students whereby respondents were not manipulated since they filled the questionnaires independently. These instruments will provide information about the purpose of the study and the overall responses of the learners, and it was designed specifically for students, in line with the research objectives.

The pretest and posttest consisted of 30 item multiple-choice test, and it was distributed to all participants via Google forms before and after the implementation

of the strategy. Some items from this test were taken from the school year 2019-2020 periodic test following the table of specifications (TOS). The content of the achievement test was validated and checked by two (2) experts and Science Department Head. The achievement test was piloted by the grade 10 students of section Bonifacio that consisted of fifty (50) students handled by the researcher way back S.Y 2019-2020.

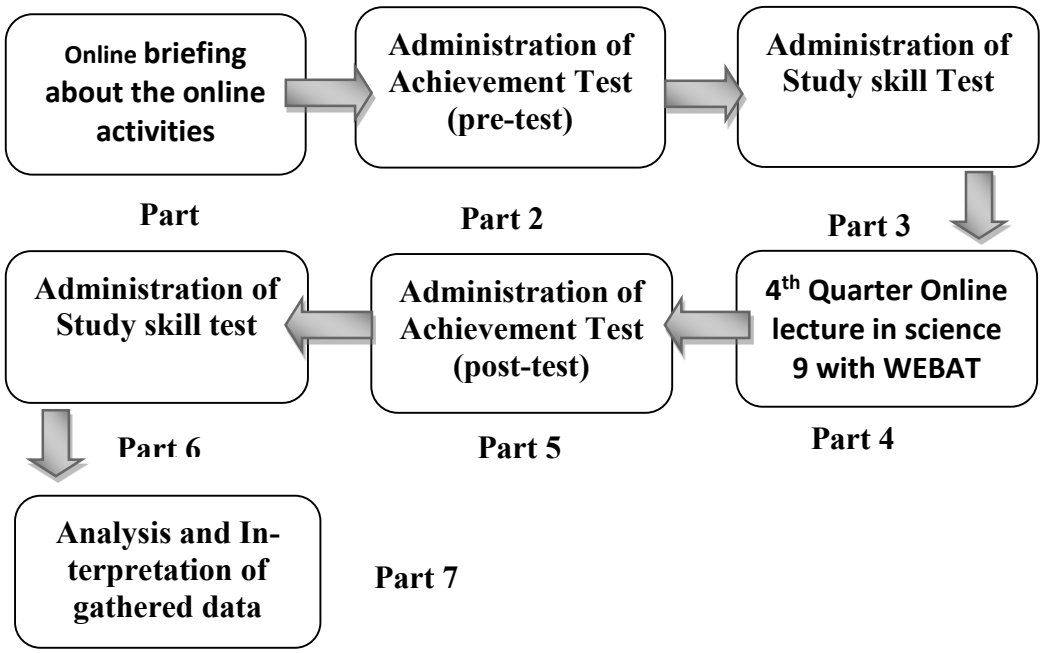
The pretest and posttest results of the experimental and control group of respondents were compared and evaluated whether one is increased or the other one is not and to determine whether the positive academic achievement of the experimental group was achieved or not.

The study skill test questionnaire consists of 30 item questions, and it was also distributed to all participants via Google forms before and after the implementation of the strategy to determine whether the strong study skills of the experimental group were achieved or not.

Students were reminded that there are no right or wrong answers in the study skills questionnaire given to them and that their responses would not affect their grades, so they were asked to respond to the items of the questionnaire truthfully. The participants were assured of the confidentiality of all their information.

Overall, this strategy is created not to compare with the existing modules provided by the Department of Education -SDO Muntinlupa but to help the educators/teachers to make a way to help the students to have a good grade even there’s a lot of unreturned and returned modules with no answers during this pandemic.

Fig 2. Summary of parts on the flow of the activities.



Statistical Analysis

Here are some statistical treatments used to present the gathered data from this research. Raw data will be tabulated, coded, and statistically processed using MS Excel software. The researcher will use descriptive statistics as well as inferential statistics to describe and summarize the data about the sample. A paired t-test is applied to examine the significant difference between the pretest and posttest of the Achievement Test. The t-test and paired t-test (with unequal variance) were also applied to know the significant difference between the post-test to the study skills of the students.

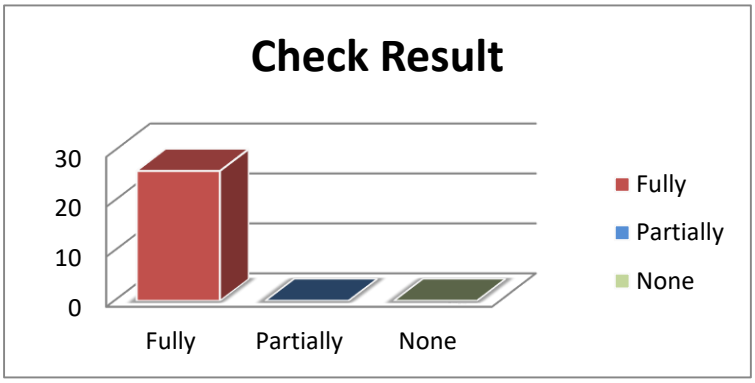
The pre-test and post-test composed of 30 item questions each test, this test consisted of the following objectives, 10 item questions for knowledge, 10 item questions for comprehension, and 10 item questions for application, it was used to measure student's mastery level, below scores of 15 is considered failed.

Study skill test questionnaire comprised of 30 item questions. The

questionnaire has the following interpretation: scores of 30-70 weak study skills, 71-111 moderate study skills, and 112-150 strong study skills.

The descriptive stat. was used to know the result of students Mean and MPS from each interpretation in the study skills test to know the students' study skills in science 9.

Graph 1: Students' responses on the learning check of the WEBAT.



Twenty-four (24) out of twenty-four (24) samples have responded that they fully understood the topic. Therefore, students from the experimental group understood the concepts and applications of the Web-Based Advanced Teaching (WEBAT) strategy to their studies.

Result and discussion

This presents the results, findings, analysis, and interpretation of the quantitative and qualitative data gathered. Quantitative data are presented in tables to describe the findings and analysis, Qualitative research design to show the data in a narrative-tabular format. Pretest and posttest scores were the basis in determining students' achievement in science 9 before and after their exposure to Web-Based Advanced Teaching.

Figure 3. Scoring Rubric to Evaluate Student's WEBAT responses

Adapted from de Caprariis P., Barman, and Magee. 2001
Level 1: Student says he/she does not know how to answer the question.
Level 2: The student tries to answer the Warm-Up question but shows minimal accurate prior knowledge to assist in answering. The student does not use any information from the text or lecture notes to answer the question. The student may reveal misconceptions about concepts. (Incorrect answer)
Level 3: The student shows some prior knowledge and may use terminology to

The scoring rubric is composed of the different levels from 1 to 4, one (1) will be the lowest and four (4) will the highest. The levels have a different interpretation. Level 1, the student who does not know how to answer the exercises. Level 2, the student who tries to answer the exercises but shows minimal accurate prior knowledge to assist in answering. Level 3, the student who shows some prior knowledge and may use the terminology to answer the exercises and Level 4, the student answers the exercises correctly and completely.

Table 1

Analysis of the students' Warm-Up Responses Using Scoring Rubric

Warm Up Exercises	Level 1	Level 2	Level 3	Level 4	n
1st WEBAT question	1	10	10	3	24
2nd WEBAT question	0	9	13	2	24
3rd WEBAT question	0	6	10	8	24
4th WEBAT question	0	0	8	16	24
5th WEBAT question	0	4	12	8	24
6th WEBAT question	0	0	12	9	21
7th WEBAT question	0	0	2	22	24
8th WEBAT question	0	4	11	9	24
9th WEBAT question	0	2	15	5	22

10th WEBAT question	0	0	8	16	24
11th WEBAT question	0	0	18	5	23
12th WEBAT question	0	1	18	5	24
13th WEBAT question	0	0	11	13	24
14th WEBAT question	0	0	10	13	23
15th WEBAT question	0	0	17	7	24
16th WEBAT question	0	1	7	16	24
17th WEBAT question	0	0	12	12	24
TOTAL	0	37	194	169	

Based on the stated responses of the students on each level of the rubrics in the 17 item Warm-Up exercises, none of responses fell on level 1 where students did not know how to answer the exercises, 37 fell on level 2 where students tries to answer the exercises but shows minimal accurate prior knowledge to assist in answering, 194 responses in total fell on level 3 of the scoring rubric that students show a moderate amount of accurate prior knowledge and somehow used terminology to answer the exercises. Most of them does not use appropriate information from the text or lecture notes to answer the question and their answers were partially correct but still incomplete. Furthermore, 169 responses from the 17 item exercises fell on level 4, students answered the exercises correctly and completely, they

incorporate information from the text or class notes into the answer and may look for an answer outside the class (web, etc).

Tables 2 and 3 summarizes the descriptive statistics based on the students' responses to the pretest and posttests.

Table 2

Descriptive Statistics of the Pretest and Posttest Scores of the Students in ***Experimental Group*** *who exposed to Web-Based Advanced Teaching (WEBAT) (n = 24)*

Test	Highest Score	Lowest Score	Mean	Mean Difference	SD
Posttest	27	14	20.58	6.66	3.78
Pretest	21	8	13.92		4.16

The table above shows the highest and the lowest score, mean score, mean difference, and standard deviation in the posttest and pretest in the Achievement Test. It shows that the highest score attained in the posttest is 27 and the lowest score is 14, while the highest and the lowest score obtained in the pretest is 21 and 8. It also shows that the posttest has a mean score of M = 20.58, while the pretest has a mean score of M = 13.92. The mean difference between the posttest and the pretest in the Achievement Test is MD = 6.66. It shows an increase in the scores of the students suggesting that the students performed better after their exposure to the Web-Based Advanced Teaching (WEBAT) Strategy. The standard deviation of SD = 3.78 in the posttest is lower than the pretest with SD = 4.16, signifying that the posttest scores are more clustered around the mean than the pretest scores.

Table 3

Descriptive Statistics of the Pretest and Posttest Scores of the Students in ***Control Group*** *who exposed to DepEd's Module-SDO Muntinlupa (n = 24)*

Test	Highest Score	Lowest Score	Mean	Mean Difference	SD
Posttest	22	11	16.13	3.84	3.35
Pretest	18	8	12.29		3.38

The table above shows that the highest score attained in the posttest is 22 and the lowest score is 11, while the highest and the lowest score obtained in the pretest is 18 and 8. It also shows that the posttest has a mean score of M = 16.13, while the pretest has a mean score of M = 12.29. The mean difference between the posttest and the pretest in Achievement Test is MD = 3.84. It shows an increase in the scores of the students suggesting that the students performed better after their exposure to the DepEd's Module-SDO Muntinlupa. The standard deviation of SD = 3.35 in the posttest is lower than the pretest with 3.38, signifying that the posttest scores are more clustered around the mean than the pretest scores.

The paired t-test was also used to see whether there was a statistically significant difference between the pretest and posttest mean scores on the Achievement Test.

Table 4

Paired t-Test Between Students' Pretest and Posttest Mean Scores of ***Experimental group*** *with* ***WEBAT Strategy****.*

(n =24)

Test	Mean	Standard Deviation	df	*t*-value	*p*-value	Remark
Posttest	20.58	3.78	23	5.52	.000	Significant
Pretest	13.91	4.16				

$p < 0.05$

The posttest mean score ($\bar{x}$ = 20.58) is higher than the pretest mean score ($\bar{x}$ = 13.91), and the standard deviation of the posttest SD = 3.78 is lower than the pretest SD = 4.16. Since the computed *p*-value .000 is less than the level of significance $p < 0.05$, it means that the Web-Based Advanced Teaching (WEBAT) Strategy has a significant effect in increasing the students' achievement in Science 9.

Table 5

Paired t-Test Between Students' Pretest and Posttest Mean Scores of ***Control Group*** *with* ***DepEd's Module – SDO Muntinlupa****.*

(n =24)

Test	Mean	Standard Deviation	df	*t*-value	*p*-value	Remark
Posttest	16.13	3.36	23	4.35	.000	Significant
Pretest	12.29	3.38				

$p < 0.05$

The posttest mean score $\bar{x}$ = 16.13 is higher than the pretest mean score $\bar{x}$ = 12.29, and the standard deviation of the posttest SD = 3.36 is lower than the pretest SD 3.38. Since the computed *p*-value .000 is less than the level of significance $p < 0.05$, it means that DepEd's Module-SDO Muntinlupa has a significant effect in increasing the students' achievement in science 9.

To Sum up, the data gathered from the pre-test and post-test of the experimental group and control group showed that the students increased their academic achievements in science 9.

However, based on the results of the two groups of respondents, students in the experimental group who underwent the Web-Based Advanced Teaching (WE-

BAT) strategy showed a higher increase in post-test compare to the students in the control group who were exposed to the DepEd's module-SDO Muntinlupa.

The result strongly showed that the Web-Based Advanced Teaching (WE-BAT) strategy is effective in increasing the academic achievements of the grade 9 students of MBHS-MAIN in Science 9.

The evidence-based on the gathered data of Mean of Control Group and Experimental Group showed that both groups received a high increase in their post-test result, but students who underwent and experienced the Web-Based Advanced Teaching (WEBAT) strategy have a higher increase in academic achievements in science 9 lesson than students who experienced the DepEd's Module-SDO Muntinlupa.

Table 6

Descriptive Statistics of the Study skills test result of ***Control Group*** *"Before" being exposed to the module provided by the DepEd-SDO Muntinlupa. (n=24)*

Study skills	*Mean*	*Standard Deviation*
Weak	*18.24*	*1.90*
Moderate	*21.09*	*1.27*

The result of the study skills test showed **weak study skills** with the mean of $\bar{x}$ = 18.24, the standard deviation of SD = 1.90, and **moderate study skills** with the mean of $\bar{x}$ = 21.09, the standard deviation of SD = 1.27 among the students in Control Group "before" the use of module prescribed by DepEd-SDO Muntinlupa.

Table 7

Descriptive Statistics of the Study skills test result of ***Control Group*** *"After" being exposed to the module provided by the DepEd-SDO Muntinlupa. (n=24).*

Study skills	*Mean*	*Standard Deviation*
Weak	*18.58*	*1.43*
Moderate	*18.53*	*1.95*

The result of the study skills test showed **weak study skills** with the mean of $\bar{x}$ = 18.58, the standard deviation of SD = 1.43, and **moderate study skills** with the mean of $\bar{x}$ = 18.53, the standard deviation of SD = 1.95 among the students in Control Group "after" being exposed to the module prescribed by DepEd-SDO Muntinlupa.

Table 8

Posttest results across study skills of the students exposed to DepEd's Module-SDO Muntinlupa.

t-Test result of Post-test on across Study skills at α = *0.05 with CI = 95% (n=24)*

Study skills	Mean	Standard Deviation	df	*t*-value	*p*-value	Remark
Moderate	18.53	1.95	23	0.08	0.46	Not Significant
Week	18.58	1.43				

P > 0.05

The mean of moderate study skills ($\bar{x}$ = 18.53) is lower than the weak study skills mean score ($\bar{x}$ = 18.58), and the standard deviation of moderate study skills (SD = 1.95) is higher than the weak study skills (SD = 1.43). Since the computed *p*-value (0.46) is higher than the level of significance ($p < 0.05$), it means that DepEd's Module-SDO Muntinlupa has no significant effect in increasing the students' study skills in science 9.

The level of study skills of the control group got weak and moderate study skills only due to not so higher result of post-test. Therefore, the higher the scores of mean of post-test showing the higher level of students' study skills. To sum up, students who are exposed to DepEd's module - SDO Muntinlupa have weak and moderate study skills towards their studying the lessons in the 1st quarter.

Table 9

Descriptive Statistics of the Study skills test result of Experimental Group "Before" being exposed to Web-Based Advanced Teaching (WEBAT) Strategy. (n=24)

Study skills	*Mean*	*Standard Deviation*
Weak	*28.00*	*1.59*
Moderate	*22.08*	*1.43*

The result of the study skills test of the students exposed to WEBAT showed **weak study skills** with the mean of $\bar{x}$ = 28, a standard deviation of SD = 1.59, and **moderate study skills** with the mean of $\bar{x}$ = 22.08, the standard deviation of SD = 1.43 among the students in Experimental Group "before" being exposed to the Web-Based Advanced Teaching (WEBAT) Strategy.

Table 10

Descriptive Statistics of the Study skills test result of Experimental Group "After" being exposed to Web-Based Advanced Teaching (WEBAT) Strategy. (n=24)

Study skills	*Mean*	*Standard Deviation*
Moderate	*23.10*	*2.43*
Strong	*25.00*	*1.10*

The result of the study skills test of the students exposed to WEBAT showed **moderate study skills** with the mean of $\bar{x}$ = 23.10, the standard deviation of SD = 2.43, and **strong study skills** with the mean of $\bar{x}$ = 25.00, the standard deviation of SD = 1.10 among the students in Experimental Group "after" being exposed to the Web-Based Advanced Teaching (WEBAT) Strategy.

Table 11

Posttest results across study skills of the students exposed to Web-Based Advanced Teaching (WEBAT) Strategy.

t-Test result of Post-test on across Study skills at α = *0.05 with CI = 95% (n=24)*

Study skills	Mean	Standard Deviation	df	*t*-value	*p*-value	Remark
Moderate	23.10	2.43				
			23	2.90	0.004	Significant
Strong	25.00	1.10				

P < 0.05

The mean of moderate study skills ($\bar{x}$ = 23.10) is lower than the strong study skills mean score ($\bar{x}$ = 25.00), and the standard deviation of moderate study skills (SD = 2.43) is higher than the strong study skills (SD = 1.10). Since the computed *p*-value (0.004) is lower than the level of significance ($p < 0.05$), it means that the Web-Based Advanced Teaching (WEBAT) Strategy has a significant effect in increasing the students' study skills in science 9.

This strongly showed that study skills have a high significance effect on the score of posttests of students who underwent the Web-Based Advanced Teaching (WEBAT) strategy. The level of study skills of the Experimental group got strong and moderate study skills because of the higher result of post-test. Therefore,

the higher the scores of mean of post-test the higher the level of students' study skills of the students in the 1st quarter lessons in science 9.

Findings

The findings of the study are summarized based on the analysis and interpretation of the gathered data.

1. The students' posttest scores in the achievement test are higher than their pretest scores.

2. There is a significant difference between pretest and posttest mean scores of the students in the Achievement Test before and after their exposure to Web-Based Advanced Teaching (WEBAT) Strategy and DepEd's Module – SDO Muntinlupa. This indicates that students' achievement significantly improved, however, students exposed to WEBAT have higher increase in achievement test compared to students exposed to DepEd's modules.

3. There is a statistically significant difference between the posttest mean scores of the students in the achievement test and the study skills test before and after their exposure to Web-Based Advanced Teaching (WEBAT) Strategy.

3. Web-based advance teaching (WEBAT) strategy was effective in increasing academic achievement of the Grade-9 students of Muntinlupa Business High School – Main in Science 9 compared to students exposed to module prescribed by the DepEd module -SDO Muntinlupa.

4. Web-Based Advanced Teaching (WEBAT) Strategy was effective in increasing the study skills of the Grade 9 students of MBHS-Main in Science over students exposed to the module prescribed by the Department of education – SDO Muntinlupa.

5. Students who underwent the Web-based advance teaching (WEBAT) strategy compared to the students who were exposed to the module prescribed by the Department of Education showed a high increase in their study skills test and post-test result.

6. Students who underwent the Web-Based Advanced Teaching (WEBAT) Strategy have moderate and strong study skills compare to the student who were exposed to DepEd's module – SDO Muntinlupa with moderate and weak study skills.

CONCLUSIONS

Based on the summary of findings the following conclusions were drawn.

1. The Web-Based Advanced Teaching (WEBAT) Strategy increased the students' academic achievement in science 9.

2. The Web-Based Advanced Teaching (WEBAT) Strategy improved the students' study skills in science 9.

3. Cooperation, interest, and participation were the factors that prompted the student's study skills and academic achievement in learning Science 9.

Recommendations

Based on the findings and conclusions drawn in this study, the following are hereby recommended:

1. Teachers are encouraged to use the Web-Based Advanced Teaching (WEBAT) Strategy in teaching Science 9 since findings indicate an improvement in the students' achievement and study skills.

2. Similar research studies should be conducted on other Science topics to establish the effectiveness of Web-Based Advanced Teaching (WEBAT) Strategy in teaching Science 9.

3. Conducting further studies on Web-Based Advanced Teaching (WEBAT) Strategy on a larger scope is suggested across grade levels and learning areas.

4. To further confirm the findings, learning activities developed in this study be adopted and implemented.

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