

Modular Approach in Teaching Science 10

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ABSTRACT

Modular approach in teaching has been a buzzword in our educational system. This paper ascertained the effectiveness of Modular Teaching Approach in teaching Grade 10 Science at Maximino Noel Memorial National High School. Quasi-experimental and Purposive sampling was utilized. Data were collected through pre-test and post-test using the learning module in Science 10 prescribed by the Department of Education. Data obtain using frequency count, percentage, mean and standard deviation and t-test for the significant difference. Results revealed that the performance of the Grade 10 students during the pre-test in the following competencies: describing the distribution of active volcanoes, earthquake epicenters, and major mountain belts; distinguishing the different types of plate boundaries; and explaining the different processes that occur along the plate boundaries, was described as Beginning. However, after using the Modular Teaching Approach, the post-test performance of the students on the aforementioned competencies increased significantly and was described as Proficient. This indicated that the approach evidently showed positive results and displayed a vital connection in increasing students' academic achievement. Thus, enhanced learning module was proposed as instructional intervention in improving students' performance in Science 10.

KEYWORDS: Learning module, Teaching Science, Modular Teaching Approach, Quasi-Experimental Design, Science 10, Cebu, Philippines

INTRODUCTION

Education is the only mean through which a society adjusts with its needs. Across the world, education is the primary agent of transformation towards sustainable development. It is a fact that quality science education is a vehicle that plays an important role in producing the best quality of graduates who will become great leaders and manpower for the country. As the world becomes increasingly scientific and technological, the impact of science is fully recognized for the economic advancement and nation's prosperity. With this, science education has always been the object of reform so that an effective science culture will be established in the society.

However, NSE (1996) pointed out that Science teaching is a complex activity that lies at the heart of the vision of science education. Callahan (2016) stated that, in the sense, a key aspect of educational innovation is the change in teaching methodology.

In addition, science educators in the early 21st century are facing a myriad of issues. Indeed, students in the United States still lag behind students in other nations in science achievement, particularly European and Asian countries (NCES, 2007).

Vidhyalaya (2013) emphasized that science is important subject at upper primary level and understanding of basic science concepts increases the content knowledge of the teachers and students. But for some time teachers faced the difficulties to understand the some science concepts. Also they had occurred difficulties to teaching some science concepts. If these concepts which are difficult to understand

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for the teachers, It will be transferring towards students incorrectly and it will create many alternative conceptions. Dunlosky, et.al. (2013) stated that the realization of the goals of science education partly depends on the instructional approaches teachers use in imparting the concepts and skills which are fundamental in building students' understanding of science. Teaching methods practice by teachers have crucial effect on enhancing the students' capabilities and potentialities for an effective, authentic and meaningful learning. It is generally observed that the quality of education students get, is largely dependent upon the quality of instruction they are given. Undoubtely, teachers must find ways to enhance learning delivery to make sure that learning is indeed transferred to the students.

Barnett et al (2004) argued that the curriculum receives scant regard in current debates about teaching and learning in higher inculcation but suggests that this may vicissitude in the context of quality assurance mechanisms and benchmarking. In teaching there are many methods which are being used and Modular teaching is a new approach in classroom settings, for experience taking in encounters in instruction also it has been getting much consideration. The system of taking in modules has turned into a piece of all level of instructions. Teaching through module is a self-taking in bundle managing one particular topic/ unit. It could be utilized within any setting helpful to the learner and may be finished at the learner's own particular pace.

According to Sejpal (2013) modular teaching is one of the most widespread and recognizes teaching learning techniques in United States, Australia and many other

Western countries including Asian region. Modular is used in almost all subjects like natural science, especially in biology and medical education and even in social sciences as well as in computers education. All kinds of subjects are being taught through modules. It is a recent development based on programmed learning; a well established and universally recognized phenomenon. It considering the individual differences among the learners which necessitate the planning for adoption of the most appropriate teaching techniques in order to help the individual grow and develop at her/his own pace. According to Albaracin & Suson (2019) stated that Teachers have to provide activities which allow students to work collaboratively. Thinking or designing activities that would arouse students' interest in their topic and that would also cater their strengths and weaknesses are relevant. Updating themselves with the current trends on aspects of diversity in relation to modern demands and social changes that address the learners' uniqueness and differences is very much helpful.

Modular Approach in Teaching

Modular teaching is a new teaching strategy in classroom settings, for arranging learning experiences in education and it has been receiving much attention. The strategy of learning modules has become a part of all level of teaching. A learning module is a self - learning package dealing with one specific subject matter/ unit. It can be used in any setting convenient to the learner and may be completed at the learner's own pace (Ali et al. 2010).

A module is a specific type of learning resource. Modules are essentially self contained, self-instructional packages, with learning paced by each student according to his/her individual needs and ability. A module covers either a single element of subject matter content or a group of content elements forming a discrete unit of subject matter or area of skill. A module has clearly defined, objectives; preferably in behavioral form (Davies, 1981). Taneja (1989) defined module as a unit of work in a course of instruction that is virtually self-contained and a method of teaching that is based on the concept of building up skills and knowledge in discrete units. A module is a set of learning opportunities organized around a well - defined topic which contains the elements of instruction, specific objectives, teaching learning activities, and evaluation using criterion-referenced measures (UNESCO, 1988) cited in Ali et al. (2010).

Use of self learning modules in teaching is another form of individual used instructions. This is called modular approach of teaching and learning (k. Jaya sree,2004) if self learning modules are available on some topics they can be given to the students as assignments for self learning .scientific attitude refers to an individual's outlook towards life. Attitude is a method condition / a stabilized method set which express itself in a tendency to react to any member of the class of stimuli in the same general way. Robert Ebel (1997) as cited in (Sadiq et al. 2014).

Modular teaching is one of the most widespread and recognizes teaching learning techniques in United States, Australia and many other Western countries including Asian region. Modular is used in almost all subjects like natural science, especially in biology and medical education and even in social sciences as well as in computers education. All kinds of subjects are being taught through modules. It is a

recent development based on programmed learning; a well established and universally recognized phenomenon. It considering the individual differences among the learners which necessitate the planning for adoption of the most appropriate teaching techniques in order to help the individual grow and develop at her/his own pace.

Education in the Philippines today is facing great challenges. One such challenge lies in the area of science instruction. It is perceived that a great number of students have hardly developed their analytical skills in science. Hence, academic institutions are now experiencing dilemma on the alarming examination performance of students in science (Dela Cruz, 2012).

Undoubtedly, in the Division of Carcar City, a large incidence of very low academic performance in science is observed; and is evident through the result of the National Achievement Test (NAT) of School Year 2012-2013, 2013-2014, 2014-2015 where the over-all Mean Percentage Score (MPS) of Carcar City Division in Science is only 42.69%, 51.07%, 51.96% respectively. Likewise, among the sixteen public high schools of the Division of Carcar City, Maximino Noel Memorial National High School (MNMNHS) got only 50.29%, 57.74%, 57.91% in Science for three (3) consecutive years. Based on these results, Science 10 has the lowest MPS among the five (5) learning areas tested.

It is now a great challenge to all public secondary schools of Carcar City to meet the pressing and emerging needs in the instructional delivery involved in the inculcation of Science 10 competencies. It is in this scenario that this research was conducted to determine the effectiveness of Modular Approach as an alternative instructional method in teaching Science to the Grade 10 students of MNMNHHS.

Background of the Study

This study is anchored on Carl Roger's Facilitation Theory. It is expanded by Jerome Bruner's Constructivist Learning Theory and supported by Article XIV of the 1987 Philippine Constitution.

The basic idea of Carl Rogers' Facilitation Theory (as cited by Dunn, 2002) perceives a teacher as the key role in the process of learning, not as a walking textbook transmitting its contents, but acts as the facilitator of learning. In his theory, Rogers addresses a kind of learning that is experiential in everyday life, which has meaning and personal relevance.

Carl Rogers' theory involves the basic premise that the goal of education must be the facilitation of change and learning. Learning is facilitated when the student participates responsibly in the learning process. When the learner chooses his own directions, helps to discover his own learning resources, formulates his own problems, decides his own course of action, and lives with the consequences of these choices, then significant learning is maximized. Thus, the use of modular instruction allows the learners to discover patterns, be responsible for their own learning, as well as learn the new concepts presented to them. As a result, much significant learning is acquired (Weibell, 2011).

This study is further strengthened by Jerome Bruner's Constructivist Learning Theory that was founded on

observation and scientific study about how people learn. According to Bruner’s Constructivist Learning Theory (as cited by McLeod, 2008), learning is an active process in which learners construct new ideas or concepts based on current/past knowledge. He advocated that if students were allowed to pursue concepts of their own they would gain a better understanding. Bruner’s works provide a rationale for using discovery and hands-on-activities. He advocated that whenever possible, teaching and learning should be conducted in such a manner that children are given opportunities to discover concepts for themselves.

Objective of the Study

This research ascertained the effectiveness of Modular Teaching Approach in teaching Grade 10 Science at Maximino Noel Memorial National High School in Guadalupe, Carcar City, Cebu for School Year 2017-2018 as basis for enhanced learning module. The findings of this study would serve as basis for constructing instructional interventions to enhance the teaching of science. This study was intended to shed some light on the recurrent necessity of finding ways and means in improving the teaching-learning process which would lead to develop a quality education and a quality of citizens to be produced by schools.

RESULTS AND DISCUSSIONS

PRE-TEST PERFORMANCE OF THE GRADE 10 STUDENTS ON THE FOLLOWING IDENTIFIED LEARNING COMPETENCIES

This part presents the pre-test performance of the Grade 10 students on the following competencies: describing the distribution of active volcanoes, earthquake epicenters, and major mountain belts; distinguishing the different types of plate boundaries; and explaining the different processes that occur along the plate boundaries.

Describing the Distribution of Active Volcanoes, Earthquake Epicenters, and Major Mountain Belts

This learning competency in Science 10 is based on DepEd K to 12 Basic Education Curriculum where learners are given activities to describe and compare the distribution of volcanoes, earthquake epicenters, and mountain ranges in the world using maps and illustrations. Table 1 presents the pre-test performance of the Grade 10 students on describing the distribution of active volcanoes, earthquake epicenters, and major mountain belts.

Range of Scores	Pre-test		
	f	%	Verbal Description
8-11	6	15	AP
4-7	28	70	D
0-3	6	15	B
Total	40	100	
Mean	5.075		
sd	1.768		

Table1.

From Table 1 on the level of performance in the pre-test scores in Science 10 revealed that out of the 40 students nobody was in Advanced and Proficient rating. On the other hand, there were six (6) or 15 percent of the students who obtained an Approaching Proficiency performance; 28 or 70 percent of the students got a performance interpreted as Developing; and six (6) students or 15 percent belonged to

Beginning in the pre-test. As presented in the table, the mean score of students during the pretest was 5.075 with a standard deviation of 1.768. This low performance in the pre-test means that the students lack mastery of this particular competency and showed little understanding of the science concepts in the previous years. The results correspond with the study of Sadiq (2014) which showed that the pretest average was low before the implementation of modular design. It could be construed that they were not fully equipped with the knowledge and skills to answer the questions given to them.

This pre-test performance results further coincide with the study of Samson (2014) revealed that the students did not have any idea on the subject matter yet. In addition, the students may have not encountered such competency yet in any discussion or reference material.

Distinguishing the Different Types of Plate Boundaries

This learning competency in Science 10 is based on DepEd K to 12 Basic Education Curriculum where learners are given tasks to identify and differentiate the different types of plate boundaries. Illustrations or pictures of the three types of plate boundaries are employed in every activity so that learners can gain a better understanding of the topic. Table 2 presents the pre-test performance of the Grade 10 students on distinguishing the different types of plate boundaries

Range of Scores	Pre-test		
	f	%	Verbal Description
4-7	22	55	D
0-3	18	45	B
Total	40	100	
Mean	3.475		
sd	1.867		

Table2.

Table 2 shows that the students’ level of performance as shown in the pre-test scores in Science 10 revealed that out of the 40 students nobody was in Advanced mark as well as in the Proficient level. Also, none obtained an Approaching Proficiency performance in the pre-test. On the other hand, 22 or 55 percent of the students obtained a performance interpreted as Developing and 18 or 45 percent belonged to Beginning in the pre-test. As presented in the table, the mean score of students during the pretest was 3.475 with a standard deviation of 1.867. The results are supported by the study of Curaraton (2009) indicating that the respondents performed low during pre-test or before the approach was introduced because the students were not able to carry out the particular science concepts or skills in their preceding years. This further confirmed with the study of Carmelotes (2012) whose findings revealed below-average performance of the students because of non-mastery of the basic concepts suggesting that majority of the students need to learn more and understand better on this competency.

Explaining the Different Processes that Occur Along the Plate Boundaries

This learning competency in Science 10 is based on DepEd K to 12 Basic Education Curriculum where learners demonstrate understanding of the geologic events or processes that occur in every type of plate boundary. Hence,

students are tasked to discuss or explain the processes that occur along the plate boundaries. Table 3 presents the pre-test performance of the Grade 10 students on explaining the different processes that occur along the plate boundaries.

Range of Scores	Pre-test		
	f	%	Verbal Description
4-7	22	55	D
0-3	18	45	B
Total	40	100	
Mean	3.475		
sd	1.867		

Table3.

Table 3 shows that the students' level of performance as shown in the pre-test scores in Science 10 revealed that out of the 40 students nobody was in Advanced mark as well as in the Proficient level. Also, none obtained an Approaching Proficiency performance in the pre-test. On the other hand, 19 or 47.5 percent of the students obtained a performance interpreted as Developing and 21 or 52.5 percent belonged to Beginning in the pre-test. As shown in the table, the mean score of students during the pretest was 3.225 with a standard deviation of 1.808. This pre-test performance result affirmed the pre-test achievement of below average conducted by Samson (2014) and Carmelotes (2012) indicating that the students' prior knowledge about the subject matter was still very minimal and the skills were not yet fully mastered.

Summary of the pre-test means of the Grade 10 students on the identified learning competencies.

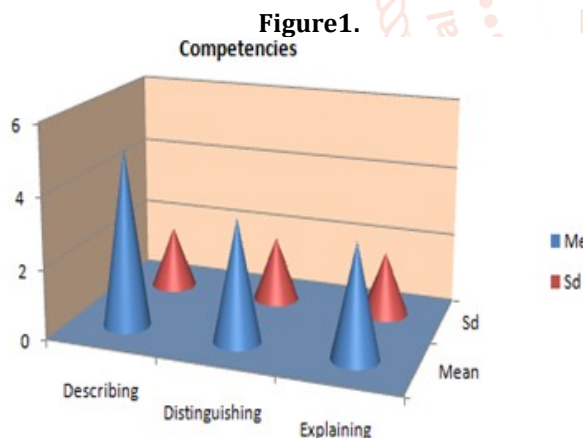


Figure 1 shows that the mean of the students in the pre-test on the identified competencies: describing the distribution of active volcanoes, earthquake epicenters, and major mountain belts (5.075) with a standard deviation of 1.768 and verbal rating of Developing. Likewise, in the next competency: distinguishing the different types of plate boundaries has a mean of 3.475 and a standard deviation of 1.867 with a verbal description as Beginning. Also, on the competency on explaining the different processes that occur along the plate boundaries, students' pre-test results obtained a mean of 3.225 and a standard deviation of 1.808 which belonged to the Beginning level.

From the Table, it can be noted that the pre-test performance of the students acquired a grand mean of 3.925 with a verbal description interpreted as Beginning. This pre-

test performance results confirmed with the pre-test achievement results of below average or low performance of the students conducted by Curaraton (2009), Rivera (2006) and Samson's study (2014), showing that the students had not grasped the ideas fully or mastered the basic and general concepts presented to them since most of the concepts were not yet introduced to them in their previous sciences.

POST-TEST PERFORMANCE OF THE GRADE 10 STUDENTS ON THE FOLLOWING IDENTIFIED LEARNING COMPETENCIES

This part presents the post-test performance of the Grade 10 students on the following competencies: describing the distribution of active volcanoes, earthquake epicenters, and major mountain belts; distinguishing the different types of plate boundaries; and explaining the different processes that occur along the plate boundaries.

Describing the Distribution of Active Volcanoes, Earthquake Epicenters, and Major Mountain Belts

This learning competency in Science 10 is based on DepEd K to 12 Basic Education Curriculum where learners are given activities to describe and compare the distribution of volcanoes, earthquake epicenters, and mountain ranges in the world using maps and illustrations.

Table 4 presents the pre-test performance of the Grade 10 students on describing the distribution of active volcanoes, earthquake epicenters, and major mountain belts.

Range of Scores	Pre-test		
	f	%	Verbal Description
8-11	6	15	AP
4-7	28	70	D
0-3	6	15	B
Total	40	100	
Mean	5.075		
sd	1.768		

Table4.

From Table 4 on the level of performance in the pre-test scores in Science 10 revealed that out of the 40 students nobody was in Advanced and Proficient rating. On the other hand, there were six (6) or 15 percent of the students who obtained an Approaching Proficiency performance; 28 or 70 percent of the students got a performance interpreted as Developing; and six (6) students or 15 percent belonged to Beginning in the pre-test. As presented in the table, the mean score of students during the pretest was 5.075 with a standard deviation of 1.768.

This low performance in the pre-test means that the students lack mastery of this particular competency and showed little understanding of the science concepts in the previous years. The results correspond with the study of Sadiq (2014) which showed that the pretest average was low before the implementation of modular design. It could be construed that they were not fully equipped with the knowledge and skills to answer the questions given to them. This pre-test performance results further coincide with the study of Samson (2014) revealed that the students did not have any idea on the subject matter yet. In addition, the students may have not encountered such competency yet in any discussion or reference material.

Distinguishing the Different Types of Plate Boundaries

This learning competency in Science 10 is based on DepEd K to 12 Basic Education Curriculum where learners are given tasks to identify and differentiate the different types of plate boundaries. Illustrations or pictures of the three types of plate boundaries are employed in every activity so that learners can gain a better understanding of the topic.

Table 5 presents the pre-test performance of the Grade 10 students on distinguishing the different types of plate boundaries.

Range of Scores	Pre-test		
	f	%	Verbal Description
4-7	22	55	D
0-3	18	45	B
Total	40	100	
Mean	3.475		
sd	1.867		

Table5.

Table 5 shows that the students' level of performance as shown in the pre-test scores in Science 10 revealed that out of the 40 students nobody was in Advanced mark as well as in the Proficient level. Also, none obtained an Approaching Proficiency performance in the pre-test. On the other hand, 22 or 55 percent of the students obtained a performance interpreted as Developing and 18 or 45 percent belonged to Beginning in the pre-test. As presented in the table, the mean score of students during the pretest was 3.475 with a standard deviation of 1.867.

The results are supported by the study of Curaraton (2009) indicating that the respondents performed low during pre-test or before the approach was introduced because the students were not able to carry out the particular science concepts or skills in their preceding years. This further confirmed with the study of Carmelotes (2012) whose findings revealed below average performance of the students because of non-mastery of the basic concepts suggesting that majority of the students need to learn more and understand better on this competency.

Explaining the Different Processes that Occur Along the Plate Boundaries

This learning competency in Science 10 is based on DepEd K to 12 Basic Education Curriculum where learners demonstrate understanding of the geologic events or processes that occur in every type of plate boundary. Hence, students are tasked to discuss or explain the processes that occur along the plate boundaries. Table 6 presents the pre-test performance of the Grade 10 students on explaining the different processes that occur along the plate boundaries.

Range of Scores	Pre-test		
	f	%	Verbal Description
4-7	22	55	D
0-3	18	45	B
Total	40	100	
Mean	3.475		
sd	1.867		

Table6.

Table 6 shows that the students' level of performance as shown in the pre-test scores in Science 10 revealed that out of the 40 students nobody was in Advanced mark as well as in the Proficient level. Also, none obtained an Approaching Proficiency performance in the pre-test. On the other hand, 19 or 47.5 percent of the students obtained a performance interpreted as Developing and 21 or 52.5 percent belonged to Beginning in the pre-test. As shown in the table, the mean score of students during the pretest was 3.225 with a standard deviation of 1.808. This pre-test performance result affirmed the pre-test achievement of below average conducted by Samson (2014) and Carmelotes (2012) indicating that the students' prior knowledge about the subject matter was still very minimal and the skills were not yet fully mastered.

Summary of the Post-test Mean of the Students in Science 10

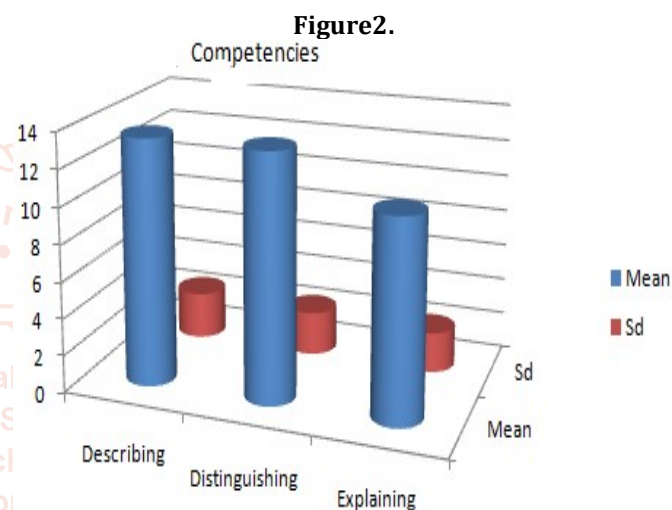


Figure 2 shows that the mean of the students in the post-test on the identified competencies: describing the distribution of active volcanoes, earthquake epicenters, and major mountain belts (13.475) with a standard deviation of 2.572 and verbal rating of Proficient. Likewise, in the next competency: distinguishing the different types of plate boundaries has a mean of 13.450 and a standard deviation of 2.385 with a verbal description as Proficient. Also, on the competency on explaining the different processes that occur along the plate boundaries, students' post-test results obtained a mean of 10.900 and a standard deviation of 2.205 which belonged to the Approaching Proficiency level. understanding of the ideas and concepts presented in the modules. The result relates to the study conducted by Guido (2014) that student assessment in the module significantly stressed out that the use of the module as a teaching tool claim to be more adequate than the traditional or conventional teaching with respect to the quality of learning as it helped them improve their understanding of the subject matter.

The findings imply that the students find the module used in the study exciting and fun to collaborate with their classmates as they were actively involved with the activities. This is further accompanied by the study of Macarandang (2009) that the uses of self-instructional materials are particularly useful as a strategy in introducing basic concepts to an entire class.

THE SIGNIFICANT DIFFERENCES OF PRE-TEST AND POST-TEST PERFORMANCES OF THE GRADE 10 STUDENTS ON THE SCIENCE 10 LEARNING COMPETENCIES

This part of the chapter presents the significant difference of pre-test and post-test performances of the Grade 10 students in the three (3) learning competencies. This is shown in Table 7, Table 8, and Table 9.

Describing the Distribution of Active Volcanoes, Earthquake Epicenters, and Major Mountain Belts

The Significant Difference of the Pre-test and Post-test Performances of the Grade 10 Students on Describing the Distribution of Active Volcanoes, Earthquake Epicenters, and Major Mountain Belts

Statistics	Mean	Difference	n	df	Sd	value		Decision	Interpretation
						t	p		
Pre-test	5.075	8.400	40	39	2.610	-20.36	0.000*	Reject H ₀	Highly Significant
Post-test	13.475								

Table7.

From the Table, it can be noted that during the pretest, the students obtained a mean of 5.075 whereas the mean post-test is 13.475 with a mean difference of 8.400 and a standard deviation of 2.610. It further shows that the t-value is -20.36 and the p-value is 0.0000. Test of significance obtained a p-value of less than 0.01 which is highly significant. This indicates that the null hypothesis was rejected and therefore concludes that there is a significant difference between the pre-test and post-test results of the students.

Table 7 further indicates that there is an increase in the mean scores of the students between their pre-test and post-test performances. It denotes that the performance of the students is enhanced greatly in this particular competency after their exposure to Modular Teaching Approach. This may be attributed to the simplified yet interesting activities in the module which help the students in understanding the concepts and mastering the competency.

The above-results had been supported by the study of Garillos (2012) that there was a significant increase in the pre-test and post-test results of the students when the Modular Approach was introduced in the class. The results were further reinforced by the study of Labis (2016) that the interesting and concrete illustrations and simplified explanations of the topics in a module effectively aid the students in understanding the concepts taught. Thus, students find it easier to accomplish the activities or tasks as set in the modules.

Distinguishing the Different Types of Plate Boundaries

The Significant Difference of the Pre-test and Post-test Performances of the Grade 10 Students on Distinguishing the Different Types of Plate Boundaries

Statistics	Mean	Difference	n	df	Sd	value		Decision	Interpretation
						t	p		
Pre-test	3.475	9.975	40	39	3.254	-19.39	0.000*	Reject H ₀	Highly Significant
Post-test	13.450								

Table8.

As reflected in table 8, it shows that during the pretest, the students obtained a mean of 3.475 whereas the mean post-test is 13.450 with a mean difference of 9.975 and a standard deviation of 3.254. It further shows that the t-value is -19.39 and the p-value is 0.0000. Test of significance obtained a p-value of less than 0.01 which is highly significant, thus, rejected the hypothesis. This implies that there is a significant difference between the pre-test and post-test scores of the students in this particular competency. Table 8 indicates that there is an increase in the mean scores of the students between their pre-test and post-test performances. The findings imply that the students got better results after their exposure to the Modular Teaching Approach. This further showed that they had an improved performance considering that they learn the concepts independently.

The results above can be associated with the study of Torre Franca (2017). The findings of her study brought about implications for both theory and practice regarding the usefulness of modules in classroom instruction and the teacher devising the modules. Modular instruction is effective in individualizing learning by allowing a student to achieve mastery of one unit of content before moving on to another.

The results further correspond to the study of Samson (2014) where the use of Modular Approach in Science was remarkably beneficial even with less supervision of the teacher. It surpassed the performance of the students subjected to a conventional classroom that required the teacher's presence all the time.

Explaining the Different Processes that Occur Along the Plate Boundaries

The Significant Difference of the Pre-test and Post-test Performances of the Grade 9 Students on Explaining the Different Processes that Occur Along the Plate Boundaries

Statistics	Mean	Difference	n	df	Sd	value		Decision	Interpretation
						t	p		
Pre-test	3.225	7.675	40	39	2.546	-19.07	0.000*	Reject H ₀	Highly Significant
Post-test	10.900								

Table 9.

As shown in Table 9, the students obtained a mean of 3.225 in the pre-test whereas the mean post-test is 10.900, with a mean difference of 7.675 and a standard deviation of 2.546. It further shows that the t-value is -19.07 and the p-value is 0.0000. Test of significance obtained a p-value of less than 0.01 which is highly significant. Hence, the null hypothesis was rejected. The results further indicate a significant difference between the pre-test and post-test results of the students. Table 11 indicates that there is an apparent increment in the mean scores of the students between their pre-test and post-test performances.

This finding affirmed the study conducted by Torre Franca (2017) implying that since the mean post-test score is greater than the mean pre-test score, there is sufficient evidence to conclude that the exposure to the instructional module generally brought about improvement in the knowledge of the students. The students were able to improve their performance with the teaching innovation being introduced.

The significant differences between the mean pre-test and post-test scores are in the affirmative, showing the effectiveness of the instructional module used in the study. This is consistent with earlier findings that show how instructional materials can assist the teachers in presenting their lessons logically and sequentially to the learners (Garillos, 2012) and as supported by Abdu-Raheem (2014) who showed how instructional materials aid explanations and make learning of subject matter comprehensible to students during the teaching-learning process.

These data imply that Modular Teaching Approach significantly improves the performance of the students in learning science concepts based from the competencies measured. In this study, it is evident that the use of modules in teaching Science greatly affects students' learning because it enabled the learners to achieve an improved performance in Science 10. Students find it stimulating and challenging as they were motivated, driven and involved actively in the various activities presented in the module.

These results signify the idea of B. Skinner (as cited by Guido, 2014) emphasizing that one way of maintaining the interest of the learners is to provide them with activities which they can perform individually, after being given the proper guidance, direction, instruction and encouragement by the teacher. This is the use of module as an instructional tool. The module used in the study claim to make students learning experience interesting and well stimulated.

CONCLUSION

Based on the findings of the study, it is concluded that Modular Approach as an alternative instructional method in teaching Science 10 significantly enhances the performance of the students. This shows that the approach used appeared to be effective and exhibited a vital connection in improving students' academic achievement in Science 10 as supported and validated by Carl Roger's Facilitation Theory, Jerome Bruner's Constructivist Learning Theory, and Article XIV of the 1987 Philippine Constitution

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