

MODULAR AND TRADITIONAL METHODS OF TEACHING SELECTED TOPICS IN HIGH SCHOOL PHYSICS

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ABSTRACT

This study compared the effectiveness of Modular Method and Traditional Method of teaching the selected Physics topics in Cantilan National High School, Cantilan Surigao del Sur. Findings were the basis for a proposal lesson guide. Age profile of students belongs to the usual age mostly within the bracket of 15-17 years old where most of them are females. The average grade level involved in the study were in scores from 85 to as low as 75 scores. Based on the academic performance level on the topic measurement, modular group had the pre-test mean lower compared to the traditional group achievement but were categorized qualitatively average. Based on the post-test score between traditional and modular groups, it was revealed that the score of the traditional group was higher compared to the modular group thus categorized as average. There is a significant difference of the level of academic performance of the traditional and modular groups in pre-test and post-test. In the measurement of the modular and traditional groups mean scores gained in pre-test and post-test, both traditional and modular methods of teaching are effective for students in High School Physics. The proposed lesson guide for modular techniques should be implemented to guide and improve the learning of students; with emphasis on the synchronization of lessons both lecture and laboratory activities in verbal and nonverbal interactions inside the classroom especially in difficult lessons and activities.

INTRODUCTION

The precious decade marked an uptrend towards teaching and learning science in its societal technological context. Knowledge and its application to improve the living conditions of the country is primarily the concern of progress in science courses at all levels. As Scourzo (1990) emphasize, the goal of science education is to design an active learning strategy terms that would seem to be challenging and worth exhilarating on the part of the students.

Society today, holds teachers accountable in using the best practice of the academic learning of their students. Organizing and accounting their strategies and skills would slowly change the students learning with history as a guide. Schools would continue to have better and competent students if teacher would provide good instructions to group of students in a classroom.

This new model challenged this researcher to choose this study to identify the needs of the students that would enable them to be productive and versatile citizens in the future. The new model aims to increase the link between the students and their communities, bringing the school resources to bear in the complex ethical, civic and technical decisions that all citizens will have to make.

The researcher thought of employing an innovative strategy a modular teaching to improve the performance level and added interest through learning. Also, she felt the need to

determine a desirable effect and sustainability in using modular teaching method in teaching high school physics in Cantilan National High School.

Based on the foregoing premises and studies, the researcher decided to venture the effect and sustainability of modular teaching. This study would provide and promote better skills and knowledge on physics and better laboratory materials to have an effective implementation.

LITERATURE REVIEW

Science information accumulated at a tremendous rate so does teaching methodology must evolve new and better procedures. An educator must keep abreast of such developments in order to keep attuned to the country's educational thrusts for the benefit of the students. Such growth can be achieved and spearhead by science educators on national, regional, division and district levels. This concern of the educational system is to make available to its clientele the foundation that will enable them to be productive in meeting the various needs of learners.

This study on cognitive and social learning among the fourth-year students of Cantilan National High School was anchored on Cognitive learning and Attribution Theory of Weiner and Social Learning Theory of Bandura (1952).

Many theories have helped explain human motivation. In the philosophy of teaching, cognitive theories provide a perspective about human motivation like cognitive learning theorists believe that individuals are aroused to action by their thinking. It is not the external events such as an individual reward or punishments that are important in explaining behavior, but instead it is the belief and attributions to hold on it.

According to Bernard Weiner a major cognitive theorists, the ways individuals come to perceive and to interpret the causes of their successes or failures are the major determinants of their motivation, rather than the innate needs of earlier experiences. Attribution theory has several important implications for teachers as students with high achievement motivations tend to associate their successes with their abilities and failures.

The researcher thought of employing an innovative strategy which was modular teaching in her physics class with the hope of improving the performance level and added interest in learning the subject. As Salandan (1990) emphasized developing self-learning instructional materials utilizing modules in one teaching procedure designed and provide learning activity of their own.

It is in this innovation learning process that the researcher felt the need to determine any desirable effect and sustainability in using modular teaching method in the teaching of high school physics in Cantilan National High School, Cantilan Surigao del Sur.

In the theory of identical elements by Skinner in 1986, it focused in the intelligence which refers to the capability to reason out, to solve problems, think, learn and understand new material measured by many different tasks. On Learning and Cognitive development proposed by Jean Piaget (1986) referring to mechanisms by which knowledge is internalized by learners attained knowledge through their experiences.

Teacher initiative and resourcefulness enhance students learning, students' inability to grasp as concept can be traced to situations most suited to conditions of learning. The tendency of the teachers to follow path of least resistance in the preparation of instructional materials is one of the causes of poor learning as well as interest in the subject (Geronimo,1998).

This study hopefully would provide and promote better skills and knowledge as effective instrument in the implementation of physics through experiences.

METHODOLOGY

A quasi-experimental design with pre-test and post-test scores was employed in order to determine the effect of modular method of teaching among the fourth year high school students of Cantilan National High School, Cantilan Surigao del Sur ,School Year 2016-2017.The findings of the study served as basis for a proposed lesson guide.

A total of 60 students-participants composed of males and females were assigned in two sections with 30 students. Section A used the modular teaching method while section B used the traditional group with lecture demonstration interactive teaching method. Pre-test and post-test were administered to the two selected groups. The Pre-test determined the initial achievement; the post-test determined the quantitative increase or decrease of students' responses after exposing them to the lesson activities. The findings were used in the formulation of a lesson guide.

The researcher used the traditional-lecture -demonstration method in carrying out the lessons of the control group. Visual aids were used to assist the lesson presentation On the other hand manual on modular teaching method as supplied by the DepEd during the series of seminars on pedagogies was used by the other group.

After both lessons were accomplished, activities were evaluated, the post-test were administered to both groups, cognitive lesson covered by both groups and results were corrected, tallied ,analyzed and interpreted for statistical treatments.

The achievements in the two selected high school physics topics and results of pre-test and post-test ,ten items were treated statistically utilizing the grade range adapted by the DepEd Secondary curriculum.

RESULTS

Table 1: Population and Respondents of the Study

Group	Male	Female	Total
Control Group	13	17	30
Experimental Group	14	16	30
Total	27	33	60

The research participants were 60 students Section A was composed of 30 males and females students assigned in modular teaching method and in traditional group with lecture-demonstration interactive teaching method.

Table 2: Profile of the Students

A . Age Level	Frequency	Percentage
21-above	8	13
18-20 years old	10	17
15-17	40	67
12-14	2	3
Total	60	100%

B. Gender Profile	Frequency	Percentage
Male	27	45
Female	33	55
Total	60	100%

C Average Scores in Physics (First Grading Period)					
Raw Scores	Males	Females	Total Score		Percentage
95-100		10	10		
92-94		15	15		
89-91		0	0		
86-88	4	6	10		
83-85	4	4	8		13
80-82	8	10	18	60	30
77-79	8	10	18	Students	30
75-76	7	9	16		27
Below 75	10	15	15		
Dropped	10	0	10		
Total	51	79	130		100%

As to their average grade in the first grading period students who obtained scores from 85 down to 75 were utilized as respondents in this study, this is done after arranging their scores from highest to lowest to equalize performance level. As seen on the table highlighted are 60 students who served as respondents.

**Table 3: Profile of Pre-Test Score
Topic: Measurement**

			TRADITIONAL GROUP Pre-Test				MODULAR GROUP Pre-Test			
LEVEL	RANGE	Qualitative Equivalent	MALE	FEMAL E	TOTAL	WP	MALE	FEMALE	TOTAL	WP
4	7.51-10	VERY HIGH		1	1	4			0	0
3	5.01-7.5	HIGH	4	5	9	27	4	5	9	27
2	2.51-5.0	AVERAGE	5	5	10	20	5	5	10	20
1	0.00-2.5	LOW	4	6	10	10	5	6	11	11
			TOTAL		30	61	TOTAL		30	58
			Mean = 2.03 R. Category = Average				Mean = 1.93 R. Category = Average			

The total weighted points of the traditional group was found 61 and its mean is 2.03 categorized as average while the modular group obtained a total weighted points of 58 with a weighted mean of .93 categorized as average.

PROFILE OF POST-TEST SCORES
Topic: Measurement

LEVEL	RANGE	Qualitative Equivalent	TRADITIONAL GROUP Pre-Test				MODULAR GROUP Pre-Test			
			Male	Female	Total	WP	Male	Female	Total	WP
4	7.51-10	Very High	3	3	6	24	1	1	2	8
3	5.01-7.5	High	6	9	15	45	4	5	9	27
2	2.51-5.0	Average	4	5	9	18	4	5	9	18
1	0.00-2.5	Low	0	0	0	0	5	5	10	10
			TOTAL		30	87	TOTAL		30	63
			Mean = 2.9 R. Category = High				Mean = 2.1 R. Category = Average			

Post-test obtained a weighted points of 87 categorized as high while the modular group obtained a total weighted points of 63 with a mean of 2.1 categorized as average. It was revealed that the traditional group obtained a higher category than the modular group.

Table 4: PROFILE OF POST-TEST SCORE
Topic: Forces and Motion

LEVEL	RANGE	Qualitative Equivalent	TRADITIONAL GROUP Pre-Test				MODULAR GROUP Pre-Test			
			MALE	FEMALE	TOTAL	WP	MALE	FEMALE	TOTAL	WP
4	7.51-10	Very High	3	4	7	28	1	1	2	8
3	5.01-7.5	High	6	8	14	42	4	4	8	24
2	2.51-5.0	Average	3	5	8	16	6	8	14	28
1	0.00-2.5	Low	1	0	1	1	3	3	6	6
			TOTAL		30	87	TOTAL		30	66
			Mean = 2.9 R. Category = High				Mean = 2.1 R. Category = Average			

The table showed that the traditional group total weighted points re 87 with a computed mean of 2.9 categorized as high. These tells that there was an increase in their scores and improved achievement. The modular group has total weighted points of 66 with a mean of 2.1 categorized as average. The result implies that the students do have the encouragement and remedial drills as reinforcement to develop positive attitude towards learning.

Table 5: T-TEST RESULT
Topic: Measurement

Variable	Mean Score	Degrees of Freedom	P-Value (0.05)	Computed T-Value	Tabulated T-Value	Decision
Tradition Group						
Pre-Test	3.967	29	0	12.545	2.045	Reject Ho
Post-Test	6.667	29				

Variable	Mean Score	Degrees of Freedom	P-Value	Computer T-Value	Tabulated T-Value	Decision
Modular Group						
Pre-Test	6.467	29	0.022	7.763	2.045	Reject Ho
Post-Test	4.833	29				

CONCLUSION

In terms of level of difference between the pre-test and post-test, it was revealed that the traditional group has a computed T-value of 12.545 with a tabulated value of 2.045 while under modular its computed T-value is 7.763 with a tabulated T-value of 2.045, both of the results in their pre-test and post-test means are rejected.

Table 6: T-TEST RESULT
Topic: Force and Motion

Variable	Mean Score	Degrees of Freedom	P-Value (0.05)	Computed T-Value	Tabulated T-Value	Decision
Modular Group						
Pre-Test	2.9	29	0.002	8.3221	2.045	Reject Ho
Post-Test	5.1	29				

Variable	Mean Score	Degrees of Freedom	P-Value (0.05)	Computed T-Value	Tabulated T-Value	Decision
Modular Group						
Pre-Test	2.9	29	0.002	8.3221	2.045	Reject Ho
Post-Test	5.1	29				

CONCLUSION

In terms of achievement level between the pre-test and post-test, it was revealed that there was significant difference between the two after exposure to the innovative method, thus hypothesis under the traditional group was rejected but after the comparison between the pre-test means of the modular and traditional group the hypothesis was accepted. The comparison of their post-test the hypothesis are rejected. This means that the students improved their knowledge on the new method of teaching.

**Table 7: T-TEST RESULT
Comparison of Pre-Test and Post-Test**

Variable	Mean Score	Degrees of Freedom	P-Value (0.05)	Computed T-Value	Tabulated T-Value	Decision
Traditional Pre-Test	3.7	29	0.1776	1.3646	2.000	Accept Ho
Modular Pre-Test	2.9	29				

CONCLUSION

By comparing the result of both pre-test and post-test of the traditional and modular group having 2.9 mean and traditional having 3.7 mean it can be gleaned with a P-value of 0.1776 both achieved a computed T-value of 1.3646 with a tabulated T-value of 2.000 the significance difference between the pre-test mean scores of both modular and experimental are accepted.

Variable	Mean Score	Degrees of Freedom	P-Value (0.05)	Computed T-Value	Tabulated T-Value	Decision
Traditional Post-Test	6.8	29	0.002	3.1872	2.000	Reject Ho
Modular Post-Test	5.1	29				

CONCLUSION

In comparison of their post-test scores having a traditional men of 5.1 and a modular mean of 6.8 at P-Value of 0.002 both achieve a computed T-value of 3.1872 with a tabulated T-value of 2.000 where the significant difference between the post-test means scores was rejected.

**Table 8: T-TEST RESULT GAIN
Topic: Forces and Motion**

Variable	Mean Score	Degrees of Freedom	P-Value (0.05)	Computed T-Value	Tabulated T-Value	Decision
Traditional Post-Test	3.7	29	0	11.5475	2.045	Reject Ho
Modular Post-Test	6.8	29				

CONCLUSION

Therefore, there is significant difference between the pre-test and post-test means score of the traditional group.

Variable	Mean Score	Degrees of Freedom	P-Value (0.05)	Computed T-Value	Tabulated T-Value	Decision
Modular Group						
Traditional	2.9	29	0.002	8.3221	2.045	Reject Ho
Modular	5.1	29				

CONCLUSION

Therefore, there is significant difference between the pre -test and post-test means score of the modular group.

CONCLUSIONS

From the findings of the study, the following conclusions are drawn:

The traditional and modular group in their scores in two selected topics revealed an initial performance level similar or average in category but in their pre-test mean score, the traditional group showed high category while the modular group revealed low and average. However, the traditional group did not reach “very high” category which that the “teacher-centered” method was not that superior to the modular method.

There was significant difference between the pre-test and post-test means score of the traditional and modular group however significant difference was shown in the post-test score.

There was a significance difference in the comparison between the pre-test and post-test results of both modular and traditional groups.

There was a significant difference between the mean scores gained in the two selected topics in physics in both traditional and modular groups.

ACKNOWLEDGEMENT

This piece of work would not be possible without the help of the following to whom the researcher sincerely would like to thank for their contributions that lead to the completion of this paper.

First of all ,to the almighty God ,the source of all things.

To her loving and supportive husband Bonifacio T. Romoroza and her children Marbhy Grace,Val Earlvien and Keziah for their patience and understanding which have been the source of inspiration;

To the Dean of the Graduate School,Dr. Rouel A. Longinos,for his encouragement which gave me the strength to finish the work;

To Dr. Elvisa Q. Lahoy, her thesis adviser, whose support is insurmountable and ideas and suggestions are contributed for the completion of the paper;

To the panel of examiners,Professor.Richard F. Ruelan and Professor. Alexphil Ponse and Professor. Mark Ian Andres,wh shared so much in the refinement of this paper and whose implications help improve this paper;

To Professor. Mark Ian Andres who had patience to go over the data and helped in the computation;

To Mr. Fluellen L. Cos, our beloved principal and Mrs. Evangeline B. Lozaldo, Filipino Supervisor for their untiring support and encouragement to the researcher.

And to all the colleagues in Cantilan National High School, headed by the principal, who shared their precious time to make this study possible.

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