

COMPARATIVE PERFORMANCE OF LEARNERS EXPOSED TO CENTER-BASED LEARNING APPROACH AND CONVENTIONAL APPROACH

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ABSTRACT

The purpose of the study was to compare the performance of the two regular Grade VI elementary Science and Health classes after exposure to two approaches, the Center-Based Learning Approach and the Conventional Approach in teaching. It used a quasi-experimental design. A 50- item-multiple choice knowledge pre-test and post-tests were given. The mean ratings of performance test between the two groups were computed. The researcher used ANCOVA in finding the difference of the performance of the two intact Grade Six classes. The analysis of Covariance Results showed that the performance of the Grade VI pupils in Science and Health subject when taught with Center-Based Learning Approach and Conventional Approach, differ significantly. The observed significant level which is $<.0005$ is less than $.05$ which led to the rejection of the null hypothesis which means there is significant difference on Grade VI pupils' performance in science subject. Between the two approaches, the Grade VI pupils performed better when exposed to Center-Based Learning Approach than when pupils were exposed to the Conventional Approach. The Center-Based Learning Approach was capable of producing better learning performance in teaching than the Conventional Approach in Teaching Science and Health subject in the elementary grades. The Center-Based Learning Approach therefore is an effective approach in teaching elementary Science and Health subject and is therefore recommended for utilization and application.

Keywords: *The Center-Based Learning Approach, Pedagogy, Integrating ICT in Teaching, Effectiveness of Pedagogy, Effective Approach, Teaching Science, Innovative Approach, Comparative Performance, Quasi-Experimental Design Research, Philippines*

1. Introduction

The Science Program in the 2002 Basic Education Curriculum aims to help every Filipino learner gain a functional understanding of scientific concepts and principles linked with real-life situations, and acquire scientific skills, attitudes, and values necessary to analyze and solve day-to-day problems. In the restructured curriculum, Grades 1 and 2, simple scientific concepts and skills are taken up in English and Makabayan. Science begins as the children are taught to observe, monitor, and describe their interaction with their immediate environment. In Grade 3, the teaching of Science as a separate learning area begins. Science from Grades 3-6 includes basic health concepts, and thus the nomenclature Science and Health. Time allotment for Science is increased in Grades 4-6. (DepEd 2002). In the secondary curriculum for First Year, Integrated Science builds on elementary Science, and presents basic concepts in earth science, biology, chemistry, and physics. In Second Year, the learners focus on Biology, which deals with the living world of human and non-human species, human interactions and relationships with the environment, and the problems we face relative to

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health, reproduction and heredity, food production, resource management and conservation. In Third year, learners focus on Chemistry, which deals with the properties and chemical behavior of matter, atomic structure, chemical changes, and technology affecting the environment and society. In Fourth Year, the graduating students have the option to take up either Physics or Advanced Chemistry (DepEd 2002).

Science content is delivered using a variety of media and resources. From a textbook driven coverage of content, schools are encouraged to use Information and Communication Technology (ICT) and community resources to widen access to knowledge and to enrich learning. The teaching-learning process is interactive where learners, the teachers, instructional materials and information technology interact with one another. Learning is assessed using a variety of measures. The purpose is to gather information about the learners' progress in holistic terms. The restructured curriculum involves innovative, interdisciplinary and integrative modes of institutional delivery (DepEd 2012).

It is believed that Math and Science are excellent subjects to test children because these subjects are taught and tested devoid of culture and emotion (Dela Cruz 2012). Language, Math and Science are considered as tool subjects in school worldwide.

In the 1999 Third International Mathematics and Science Study (TIMSS), the Philippines ranked 36th in 2nd year high school Science out of 38 countries. In 2003, the country had a similar result in the same subject, ranking 23rd in Grade 4 Science, among 25 countries. The Philippines started talking about a crisis in the educational system. In the high school level, we ranked 42nd in 2nd year Science, among 45 countries. The Philippines did not participate anymore in the 2007 TIMSS (Dela Cruz 2012). It is a fact, Asians are the ones topping the TIMSS. These are Singapore, Taiwan, South Korea, Hong Kong (China) and Japan. Filipino students sometimes top international Science competitions, but they usually come from science high schools with special programs (Batomalague 2010).

However, a student's exam results in the subjects cannot predict his success in life because grades are greatly conditioned by teaching itself (Dela Cruz, 2012). A person may be labeled as poor in Science not because he is dumb but because of the low quality of science education he has received. A teacher should implement a type of instruction that will be needed for students to achieve the standards. A teacher should choose pedagogical approaches that can move students toward greater scientific understanding and learning (ICSU 2011). Teachers should be smart enough to integrate the Multiple Intelligence Theory in their lessons and design challenging activities that will invite involvement while strengthening learners' intelligences (Apat 2004). Bottini and Grossman (2005) found out in their experiment that classroom which utilizes learning centers, not only provide children with opportunities to explore, experiment, and construct their own knowledge, they also provide opportunities for movement, socialization, choice making, responsibility, and problem solving.

The researcher believed that the Center-Based Learning Approach (Apat 2004) can move students toward greater scientific understanding and learning. So, the researcher aimed to investigate in this research, the effectiveness of this pedagogy through comparing the performance of the Grade VI pupils in Science and Health subject after exposure to two approaches, the Center-Based Learning Approach and the Conventional Approach.

2. Framework

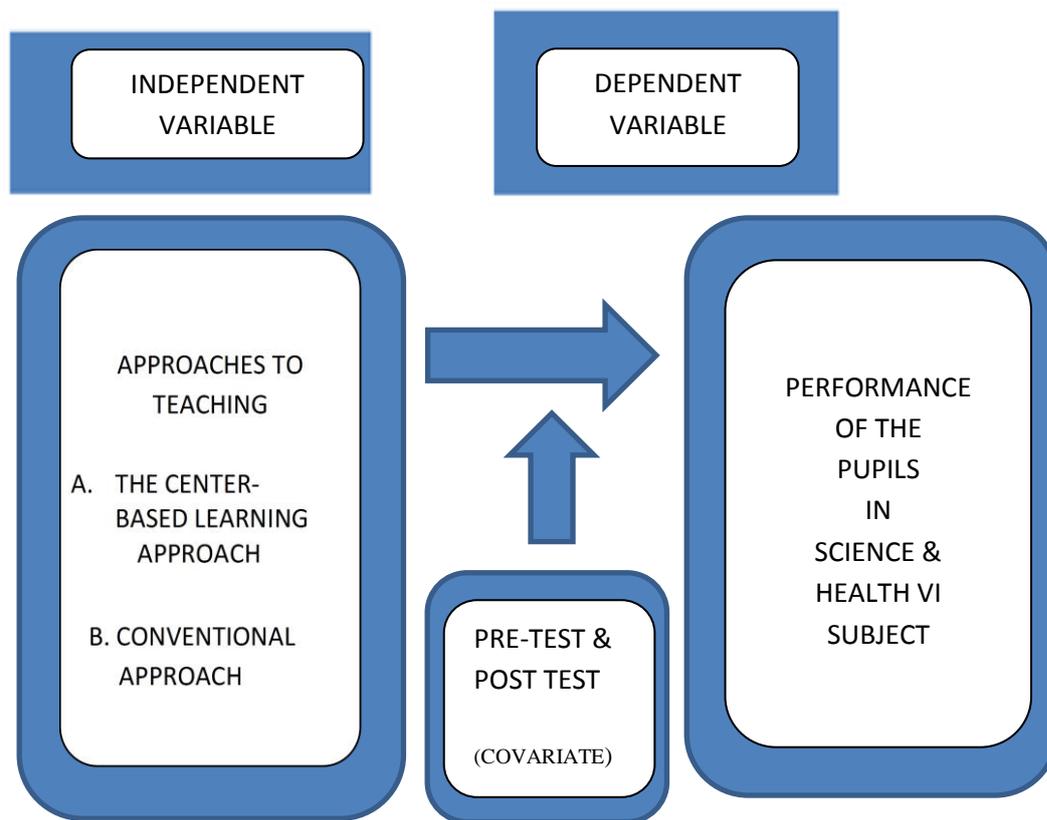


Figure 1. *Research Paradigm*

3. Objectives of the Study

The researcher aimed to investigate in this research, the effectiveness of the pedagogy, The center-Based Learning approach through comparing the performance of the two intact Grade VI elementary pupils in Science and Health subject after exposure to two approaches, the Center-Based Learning Approach and the Conventional Approach in teaching during the 2nd Semester of AY 2012-2013.

4. Methodology

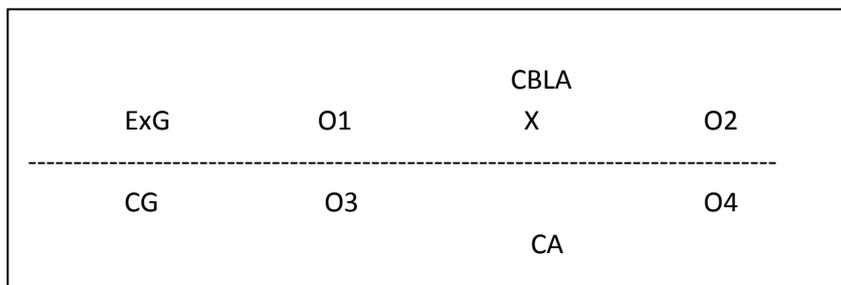
The study used the Quasi-Experimental Research Design comparing the performance of the two randomly selected Grade VI Science classes. The Narra class was the experimental group which was exposed to the Center-Based Learning Approach and the Lawaan class, the control group which was exposed to Conventional Approach. The experimental and the control classes were taught with the subject Science and Health within one grading period, third grading period in particular. Both were taught by one teacher demonstrator. The experimental group, Narra, was taught with Science subject every 8:05-9:05 AM daily for two hours and the control group, Lawaan, was taught every 10:00-12:00 for two hours also.

One section was chosen randomly as the experimental group and the other one, chosen randomly also, the control group. The experimental group was taught using The Center-Based Learning

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Approach and the control group with the Conventional Approach. One teacher handled the two classes. Before the pupils' exposure to the two approaches namely, the Center-Based Learning Approach and the Conventional Approach, the two intact Grade Six classes were given 50-item pre-test.

Figure 2. Research Design for Pre Test and Post Test Experiment



This study was conducted at East Prosperidad Central Elementary School and East Prosperidad SpEd School in the division of Agusan del Sur.

The subjects of the study were the 98 pupils of EPCES . The 43 Grade VI pupils of Narra class as the Experimental Group and 45 Grade VI pupils of Lawaan class as the Control Group. The experiment covered one grading period, third grading period in particular or 3rd quarter of DepEd calendar year 2012-2013.

The data gathering tool used in this study was the 50-item knowledge test conducted as the pre and post-test during the third grading period of DepEd calendar year 2012-2013, third quarter. The test covered learning competencies found in the Grade VI Third Grading Science Learning Continuum. The fourteen (14) third grading learning competencies covered topics about volcano, volcano eruption, earthquake due to volcano eruption, effects of eruption, precautionary measures before, during and after volcanic eruption, climate and its types. The test is composed of 50 items which includes 60% easy (30 items), 30% average (15 items) and 10% difficult (5 items) category percentage.

The test items were shown and reviewed by ten teachers of East Prosperidad Central Elementary School, and East Prosperidad SpEd School, Division of Agusan del Sur. They were requested to review the items of the test paper. All of them gave positive remarks on the instrument. They commented that the items are appropriate for assessing learner's performance in Science and Health VI, third grading learning competencies. The items are comprehensible for the Grade VI pupils. It suits the vocabulary level of the respondents and the content of every item accurately reflects the third grading learning competencies. They also commented that each item measures the understanding and performance of the Grade VI learners on Science and Health subject learning competencies, 3rd quarter, third grading period, Deped calendar year 2012-2013 and is accurately presented for the purpose of the study.

Reliability refers to the consistency of the test. Arthur Traxler (1973) points that a test which is reliable will yield approximately the same result upon repeated administration. The reliability of a test is determined by computing the coefficient of correlation between the result of the test as administered either singly or twice. The reliability of the test was reviewed by the ten public elementary Grade VI Science and Health teachers who were assigned at EPCES during the SY 2012-2013. The reviewers were requested to check any of the two columns such as very appropriate and

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$$r = \frac{S - S_e}{S}$$

not appropriate. If answer is very appropriate, a weight of 1 is credited, if not appropriate, there is no credit given to the response. After getting the scores, the coefficient of reliability was computed using the Cronbach formula (1970),

It was found that the computed r was 0.84 and is considered highly reliable. According to Downie and Health (1984) in every usage on r of 0.8 and above is considered a high coefficient.

Before the test was given to the respondents, permission to conduct the study was secured from the school division Superintendent of DepEd Agusan del Sur. After which, it was presented to the district supervisor and school principals of the schools where the subject and respondents were located.

The test was administered personally by the researcher. It was done to make sure of the 100 percent retrieval of the test paper and to get an accurate assessment of the performance of the two Grade VI classes. Before conducting the pre-test to the respondents, they were made to understand the purpose of the study. The result of the pre-test was not announced to the pupils. Post-test was conducted after one grading period, 3rd grading period in particular. The researcher collected the data of the pre-test and the post-test for the Narra, the experimental group and Lawaan, the control group. The researcher compared the performance of the two grade 6 classes to find the extent of performance after exposure to CBLA and CA.

An analysis of a given 50- item-multiple choice knowledge pre-test and post-test for CBLA and Conventional Approach was done. The mean ratings of performance test between the two groups were computed. The researcher used ANCOVA in finding the difference of the performance of the two Grade six classes exposed to CBLA and Conventional Approach.

5. Results and Findings

Table 1

Mean Performance of the Grade Six Pupils In Science and Health

Group (in Percent)	N	Mean	SD	Mastery Level
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PRE-TEST				
Control	44	12.20	1.69	24.40
Experiment	43	10.77	2.06	21.54
Over-All Mean		87		
POST TEST				
Control	44	28.64	4.30	57.28
Experiment	43	36.14	4.67	72.28
Over-All Mean		87		

TPS - 50

After the control group pupils were exposed to Conventional Approach of teaching Science 6 for one grading period, its mean performance increased from 12.20 to 28.64 with SD from 1.69 to 4.30. There is mastery level increase from 24.40% to 57.28% which is higher than DepEd Mastery Level Standard (50%), as shown in table 1.

While the mean performance of the experimental group who were exposed to the Center-Based Learning Approach for one grading period, increases (table 1) from 10.77 to 36.14 with SD from 2.06 to 4.67. The mastery level improved from 21.54% to 72.28% which is higher than the DepEd mastery level standard.

Table 2.

Analysis of Covariance Results

Source of Variations	Sum of Squares	df	Mean Square	F	p-value
Group	102.032	1	1002.032	49.399*	<.0005
Pre-Test (Covariate)	7.447	7.447	0.367	0.546	
Error	1703.898	84	20.284		
Total	2713.377	86			

*significant at $\alpha = 0.05$ R² = 0.420

TPS=50

Table 2, Analysis of Covariance Results showed that the performance of the Grade VI pupils in Science and Health subject when taught with Center-Based Learning Approach and Conventional Approach, differ significantly. The observed significant level which is <.0005 is less than .05 which led to the rejection of the null hypothesis.

The covariate which is the pre-test showed that the performance scores of the experimental group and control group were not significant which means that they have the same performance. Moreover, the R²(.420) indicated that 42% of the variance in the observed performance scores could be explained by the teacher methods used.

Between the two approaches, the Grade VI pupils perform better when exposed to Center-Based Learning Approach than when pupils are exposed to the Conventional Approach.

Basing on the findings, the Center-Based Learning Approach was capable of producing better learning performance than the Conventional Approach in Teaching Science and Health subject in the elementary grades. According to Apat (2004), Center-Based Learning created and expanded opportunities for different learning styles and multiple intelligences as well as teaching practices

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while coping with this rapidly changing world in the computer center. The classroom was seen as a community of learners engaged in activity, discourse and reflection. It creates an environment where learners develop real-life skills such as time management, cooperation, responsibility and flexibility. Empowering learners to think by themselves makes them skillful and autonomous learners.

Bottini and Grossman (2005) also supported that classroom which utilizes learning centers, not only provide children with opportunities to explore, experiment, and construct their own knowledge, they also provide opportunities for movement, socialization, choice making, responsibility, and problem solving. They stated further that art, music, and movement activities in the centers allowed expression of thoughts and feelings and relieve stress while encouraging creativity.

According to the study of an approach in teaching by Patel (2003), an effective approach leads to a stimulating learning environment which influences and inspires critical learners. Ownership of knowledge is vital in the learning process because it provides confidence and a sense of participation in the knowledge community, leading to independence. He stated further that an approach should accommodate and recognize different kinds of students and varying ethnic groups. The modern university, especially in a multi-cultural and open society, needs to be able to meet the needs of a diverse student population.

Philosophers such as Plato and Rousseau argued that education had to address multiple dimensions of the individual while relating the person to society. According to Campbell, (2011) educators could adapt a wide variety of lessons with traditional and new media; address post-modern educational concerns such as multiculturalism, diversity of perspectives, respect for the individual learner, and critical thinking as strategies for helping students; encourage intellectual inquiry, embrace imagination, promote social change and transformation, and help people to live peacefully with one another.

The teacher-respondents witnessed that the center-based approach had special effects to learners. In the computer center, the learners were motivated to explore the subject content since the lessons were structured to branch out into many possibilities depending on their interest and capabilities. In all the centers, the learners made attempts to maximize understanding until their curiosity was satisfied. The pupils perceived learning tasks as interesting and personally involving.

As perceived by the researcher, the center-based tasks demanded a higher degree of learner activity in pursuit of knowledge and skills. The pupils explored the center-based tasks according to their own learning pace and took more responsibility in the learning process. In a traditional teaching milieu, pupils were more of passive listeners but center-based learning allowed pupils to explore a wealth of information as much as the centers would allow specially in the computer center where learners were allowed to explore as much as technology would allow. With the ICT, the lessons were branched out into lots of learning possibilities and opportunities. In fact the lessons were enriched with sound, moving images, colorful graphics and texts.

6. Conclusions

The Center-Based Learning Approach was capable of producing better learning performance in teaching than the Conventional Approach in Teaching Science and Health subject in the elementary grades. The Center-Based Learning Approach therefore is an effective approach in teaching elementary Science and Health subject.

7. Recommendation

1. There are already lots of computer-aided lessons and simulated lessons in ICT. It is recommended that the teachers get acquainted with them through virtual explorations and internet surfing. The teachers could also program daily lessons by themselves.

2. The Teachers of DepEd should utilize the pedagogy, The Center-Based Learning Approach in teaching if they aimed for better performance of their pupils.

2. CBLA is therefore recommended for utilization and application.

Avenue for Further Research

1.A study on the effectiveness of CBLA in teaching other disciplines in the elementary level like Mathematics, English, Makabayan and Filipino

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