
Training Program of Elementary School Science Teachers in the Division of La Union

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ABSTRACT:

The purpose of this study is to investigate the effects of the training program on the proficiency level of elementary school science teachers in the division of La Union, Philippines. A hundred elementary school teachers teaching Science served as subjects in the study through a pre post-experimental method to gauge their level of proficiency. The results showed that the proficiency level of the respondents from moderately proficient of the following criteria: Strategies in teaching Science, Instructional Materials Development, Manipulative and Laboratory Skills, and Science Research (science investigatory project and action research), was enhanced and became proficient after the conduct of the training program through the processing of data using t-test. The study further revealed that Assessment and Evaluation criteria was proficient in the pretest and remained proficient in the post-test. On the basis of the results of this research, it can be concluded that teachers' knowledge and skills should be updated on regular basis through professional development activities like attending a training program.

Keywords: *training program, science, elementary teachers, proficiency*

INTRODUCTION

Science literacy had been one of the greatest concerns of most countries across the globe, to which the Philippines belong to. Part of science education is the instruction ability of the educators to effectively teach the subject. It is a special part of the education process for it is very useful in addressing the needs of learners today.

The Secondary Science Education program adheres to develop understanding of concepts, key principles of science, process skills, and values to mold students to become scientifically literate and effective citizens.

Also, awareness of the critical issues and concerns regarding the environment must be considered. In fact, Section 10 of Article XIV of the 1987 Philippine Constitution states that Science and Technology (S & T) are indispensable for the progress and development of the nation; thus, giving priority to research and development, invention, innovation and their utilization and to Science and Technology education, training and services.

The recent state of science education in our country, particularly in the basic education level is left behind compared to other nations in the world. This is based on the result of the Second International Science Study (SISS) and Third International Mathematics and Science Study (TIMSS). In the SISS, the Philippines placed almost at the bottom of the seventeen

(17) countries which participated in the macro-scale evaluation of educational achievement. The Philippines ranked third and fourth to the last in the list of nations in the 1999 and 2003 TIMSS, respectively.

Similarly, the Department of Education (DepEd) recorded a declining achievement level of elementary and secondary learners based on National Achievement Test (NAT) results from 2005-2010. In the secondary level, the mean percentage score (MPS) of students dropped from the school year 2007-2008, which posted an MPS of 49.26 percent to 47.70 percent in the school year 2008-2009, and down to 46.30 percent for the school year 2009-2010 (Ronda, 2011).

This poor achievement of learners has incited educational research worldwide to incessantly identify factors that can account for academic outcomes in the classroom. In the majority of the reports after that of Coleman in United States of America (1996) as cited by Orleans (2007), research findings verified the quality of teacher appears to be the most important factor influencing the performance of learners.

In Regpala (2010) as cited by Asuncion (2016), former Secretary Abad mentioned that one of the main causes of problems on the low performance of learners is the unskilled teachers. The quality of Science teachers is indeed one of the contributory factors in the achievement of the learners in Science as verified by numerous researchers. The study conducted by Aava and Edomwonyi-Out (2011), exposed that a number of teachers are teaching Science but they are not graduates of Science courses.

Based on these premises and situations, the researchers are motivated to determine the Science proficiency in strategies in teaching Science, instructional materials development, manipulative and laboratory skills, Science research (science investigatory project or action research), and assessment and evaluation techniques and to propose a program to equip the teachers with sufficient scientific knowledge, skills, and attitudes to teach the Filipino learners as reflected in the recommendation of different research studies conducted such as:

- In-service education preferably workshops should be conducted to enhance the capabilities of science teachers in test construction, item analysis of test, validation of tests and innovative methods of assessment (Rituallo, 2000);
- Teachers should continue utilizing varied teaching strategies, methods, and techniques to better improve teaching-learning process. they should also be given chances to attend seminars and workshops in their related fields of specialization especially on teaching strategies, methods, techniques, and other training programs so as to gain more knowledge, strategies, and techniques as well as to be abreast with the present times. (Ferrer, 2001);
- There must be a continuous faculty development program to update the knowledge and skills on the use of other instructional strategies to ensure competence. (Sabado, 2001);
- High school teachers could adapt the laboratory skills assessment instrument in gauging students' laboratory skills performances in general science (Science I). Service training and workshops should be conducted to upgrade science teachers in terms of different authentic assessment tools. (Gatchalian, 2008);
- Intervention is needed to improve the performance of students in the different topics in chemistry like the development of interactive lessons. (Laguardia, 2015);

- Instructional materials should be evaluated by experts in the field as valid and acceptable along objectives, content, activities, and presentation in order to gain positive results. (Macaraeg, 2011);
- Physics teachers must undergo faculty development and enrichment programs on content and teaching skill, laboratory skill, use of laboratory equipment and improvisation so as to improve their knowledge especially that most of them are not majors in physics. (Brioso, 2001);
- Teachers should use other assessment methods aside from the usual or traditional assessment used but will measure not only the cognitive level but also the affective level of development. (Cosares, 2001)
- Teachers are encouraged to develop instructional materials that are computer-generated. In addition, the development of instructional materials in other disciplines is also recommended.
- Science teachers need to attain quality science instruction, through a deeper understanding of scientific concepts, attending in-service training, seminars, and workshops, need to be innovative and utilize appropriate teaching and assessment strategies, creative teaching, and commitment to excellence through teachers' empowerment. (Reyes, 2004);
- Teachers should be encouraged to attend in-service training activities to enhance their competencies in developing the thinking skills among their students. The school administration should allocate some funds for this purpose. (Balangue, 2002).

The results of this study will give the administrators an idea about reviewing the needs of their faculty. It will make them realize the necessity for capability enhancement training for their teachers which will equip the educators with the new trends in Science education.

On the other side of the coin, the teachers who are considered to be the heart of the new K-12 curriculum, will be provided with new information regarding strategies in teaching Science, instructional materials development, manipulative and laboratory skills, Science research (science investigatory project or action research), and assessment and evaluation techniques.

For the learners, the improvement on their teachers' capabilities will give them greater opportunity for learning.

OBJECTIVES

This study is designed to conduct a training program for elementary school science teachers in the division of La Union to enhance their capabilities.

Specifically, it aimed to provide data to the following objectives:

1. Determine the proficiency level of the elementary school science teachers in the division of La Union in terms of:
 - Strategies for teaching Science
 - Instructional materials development
 - Manipulative and laboratory skills
 - Science research (science investigatory project and action research), and;
 - Assessment and evaluation techniques.

2. Determine the significant difference between the performance of the elementary school science teachers in the pretest and posttest mean scores after the training program

METHODOLOGY

This study employed the experimental research design, particularly the pretest and posttest design. A group of teachers was involved in the conduct of the study. A posttest was done after the conduct of the capability enhancement seminar.

One hundred (100) elementary science teachers were chosen from selected elementary schools in the division of La Union. School selection was based on the result of the National Achievement Test for Science for the year 2015. Schools with the lowest Science achievement result were chosen as the source of teacher respondents.

The researchers prepared one hundred (100) items test for topics on strategies in teaching Science, instructional materials development, manipulative and laboratory skills, Science research (science investigatory project or action research), and assessment and evaluation techniques. A table of specifications was made to show the distribution of items. The test was validated and was pilot tested to ensure the reliability of the test and for further improvement of the tool.

The mean correct responses obtained by the group for the pretest and posttest was derived from the total number of the correct answer for every topic and then divided by the total number of items for every topic and then multiplied by 100% for the percentage mean. The descriptive rating was based on the value of the percentage mean using the following codes:

81-100	Highly Proficient
61-80	Proficient
41-60	Moderately Proficient
21-40	Slightly Proficient
0-20	Least Proficient

To determine whether a significant difference exists, a t-test was used.

RESULTS AND DISCUSSION

Table 1 shows the proficiency of the respondents in the pretest and posttest.

It shows that Strategies in Teaching Science has 42.08 mean scores in the pretest with Moderate Proficiency which implies that the respondents have shown a fundamental understanding by recognizing the processes of science. Instructional Materials Development, Manipulative and laboratory skills, and Science research (science investigatory project and action research) have Moderate Proficiency level with mean scores of 45.54, 49.70, and 40.40, respectively. This data implies that the respondents have shown a fundamental understanding by recognizing the processes of science. This may be due to the underlying change of curriculum, constant updating of materials in Science, and a little background of doing research. Assessment and Evaluation Technique has a mean score of 64.36 which

means of Proficiency Level. This means that the respondents have good or varied techniques with regard to evaluation and assessment. The data on the pretest signifies that the respondents have mostly moderate proficiency level. Meanwhile, Strategies in teaching Science, Instructional Materials Development, Manipulative and laboratory skills, Science research (science investigatory project and action research), and Assessment and Evaluation Techniques have means scores of 70.64, 73.61, 76.14, 79.46, and 65.89, respectively, in the posttest with Proficiency as descriptive rating which implies that the respondents demonstrates a basic conceptual understanding by applying the processes of science.

These data also confirm the improvement of the performance of the respondents from the pretest since the topics have already been discussed during the conduct of the test. These results show that the training in science enhanced the proficiency of the teachers in the different areas of science.

Table 1. Proficiency of the Respondents in the Pretest and Posttest

Subjects	Pretest	Descriptive Rating	Posttest	Descriptive Rating
Strategies for teaching Science	42.08	MP	70.64	P
Instructional Materials Development	45.54	MP	73.61	P
Manipulative and laboratory skills	49.70	MP	76.14	P
Science research (science investigatory project and action research)	40.40	MP	79.46	P
Assessment and Evaluation Techniques	64.36	P	65.89	P
Legend:	81-100- HP(Highly Proficient)		0-20- LP(Least Proficient)	
	61-80- P(Proficient)		21-40- SP (Slightly Proficient)	
	41-60- MP (Moderately Proficient)			

The significant difference between the results of the pretest and posttest determined whether there was an effect on the proficiency level of respondents through the training program of elementary science teachers. The SPSS was used in computing for the t-ratio to test if there was a significant difference between the pretest and posttest results. Table 2 shows the result of the computation.

Based on Table 2, it can be inferred that computed t-value of Strategies in teaching Science, Instructional Materials Development, Manipulative and laboratory skills, Science research (science investigatory project and action research), and Assessment and Evaluation Techniques are 28.83; 28.64; 42.18; 27.77; and 4.91 ($p < .01$), respectively, mean that there was a significant difference in the pretest and posttest scores in the different areas of science. It shows that the science elementary teachers have significantly improved in their understanding of concepts in science; hence, their proficiency level has improved. These

results affirm that training program was effective in the improvement of the proficiency level of science elementary teachers. This result is congruent with the study of Falk (2012) that teachers constructed Pedagogical Content Knowledge through formative assessment by building and refining knowledge of curricular goals and student understanding over multiple Professional Development sessions.

Table 2. Differences between the Pretest and Posttest Result of the Proficiency of the Elementary School Science Teachers

	Mean	Std.		Sig. (2-
	Difference	Deviation	t-value	tailed)
Strategies in Teaching Science	28.56	9.963	28.83**	.000
Instructional Materials Development	28.07	9.85	28.64**	.000
Manipulative and Laboratory skills	26.44	6.30	42.18**	.000
Science Research (science investigatory project and action research)	39.06	14.14	27.77**	.000
Assessment and Evaluation Techniques	1.53	3.14	4.91**	.000

**Significant at 0.01 level(2-tailed)

CONCLUSION

Based on the findings and results of this study, it is concluded that the Science Elementary Teachers performed better in their posttest than in their pretest due to their exposure to the training program to enhance their proficiency level to the different areas like Strategies in teaching Science, Instructional Materials Development, Manipulative and laboratory skills, Science research (science investigatory project and action research), and Assessment and Evaluation. Hence, the Department of Education particularly the La Union Division may consider giving more faculty development activities especially in science and it is likewise suggested that they may efficiently maximize resources to benefit the teaching pool of the bureau, enhance presentation of teaching materials and other learning resources, which would enhance the proficiency level of the science elementary teachers.

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