

A Study of the Status of Science Teaching in the Intermediate Grades in the District of Roxas City *

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For sometime now the Philippines has been beset by the problems of insufficiency and of economic dependence on other countries. We need scientific manpower to make us self-sufficient in our staple food, rice, and to make full use of our rich natural resources in order to become economically stable. The school, being the agency that can give us the much needed scientific manpower, must have a good science program. To improve the science program there is a need to reassess the science teaching in order to know its strengths and weaknesses. The researcher, in her desire to help solve the problem, conducted a study to ascertain the effectiveness of the science teaching in the intermediate grades in the District of Roxas City for the school year

1968-1969. The study was conducted in the twenty-one out of the twenty-seven elementary schools in the said district with 745 Grade V pupils and 595 Grade VI pupils under forty-five science teachers. The methods used in the study were questionnaire, checklist, ocular survey, and interview. The mean, the S.D., SEM percentage of error, chi square and coefficient of reliability were the statistical tools used.

The Health and Science Test for both grades was made up of one hundred items: twenty-five items of the attitude test, twenty-five items of scientific skills test, and fifty items of understanding and factual test.

The curricular validity of the Grade V and the Grade VI Health and Science Test was evaluated.

* An abstract of a Master's Thesis done at Central Philippine University, Iloilo City, Philippines.

Each of the two tests was evaluated by ten persons considered to be knowledgeable in science. The standard set for rating each item of the test is as follows: 5-Very very important; 4-very important; 3-important; 2-fairly important; 1-not important; 0-useless.

Any of the items that was rated not important or useless, was either improved or changed. Not one of the test items of the two tests was rated not important or useless, so not one of the test items was improved or changed. The general average curricular validity of the Grade V and the Grade VI Health and Science Test was 3.875 which falls within the category "Important."

The reliability of the test used in this research was also computed. The investigator used the split-half method of the Spearman-Brown prophecy formula. Through systematic sampling, two hundred samples were used for each of the Grade V and the Grade VI. As computed, the coefficient of reliability of the Grade V Health and Science Test was +.74 while that of the Grade VI was +.79. T.L. Kelly proposed a minimum r-value of .50 for evaluating group accomplishment. Based on this standard, the

reliability of the two tests used in this research was high.

The outcomes of this study are summarized under five topics:

1. Instructional outcomes in the understanding of scientific concepts and the application of scientific processes and attitudes.
2. The science teachers' special training in science teaching
3. Preparation time of science teachers
4. Instructional materials, aids and guides, library facilities and laboratory provisions
5. Supervisory assistance of science teachers.

Instructional Outcomes in the Understanding of Scientific Concepts and the Application of Scientific Processes and Attitudes

The sample pupils' achievements in Science as revealed by the test results were as follows: The population mean of all the Grade V pupils in the schools in the District of Roxas City was estimated with 99% confidence to fall between 35-36 while that of the Grade VI pupils with also 99% confidence falls between 40-42. The Grade V pupils had developed properly only two scientific attitudes out of the seven included in the test. Not one of the skills was properly developed

in them. Out of the fifty scientific facts in the test, only two were well understood. The sample mean of the Grade V was between 35-53 with an S.D. of 7.3. As for the Grade VI, they were able to develop properly only three scientific attitudes out of seven. Only one of the scientific skills was well developed, and of the fifty scientific facts, only five were well understood. The sample mean of the Grade VI pupils was 40.59 with an S.D. of 9.25.

The Science Teachers' Special Training in Science Teaching

There is a great possibility that the special training the science teachers had on science teaching, greatly affected their teaching emphasis and the method of teaching they used which in turn had something to do with the pupils' learning and achievement in science.

Out of the forty-five science teachers under study, only fourteen or 31% had special training in the modern approach in teaching science. Only five of the fourteen teachers with special training or 11% of all the forty-five science teachers were implementing the new approach in science teaching.

Preparation Time of Science Teachers

The success of the days' teaching depends to a great extent on the teachers' preparation.

Based on the data on hand, 47% of the science teachers under study had time to prepare for their science teaching. These teachers included three relief teachers and thirteen advisory teachers. It is worth considering that these teachers did not teach science subjects only but also other subjects which call for preparation, too. Most of the teachers under study, 53% of them, lack time for preparation. For this reason one can judge how unsuccessful the daily science teaching of most of the teachers under study were.

Instructional Materials, Aids and Guides, Library Facilities and Laboratory Provision

The teachers under study were in dire need of equipment and materials for classroom demonstrations and for individual and group laboratory work. The well selected and easily accessible books, periodicals, pamphlets, and reference materials were also limited. The same situation prevailed with regard to the reading materials appropriate

for pupils of different activities and interests. As for the study and teaching guides, laboratory manual and project materials, and resource units, the teachers under study had moderate supply. However, based on Table XIV and on the interview, a great percentage of the teachers, 89% of them or 40 out of 45 science teachers under study did not follow the guide in the process approach for the reason that they lacked needed materials for demonstration and experiments aside from the lack of time to prepare for laboratory work, (Table XIV). For this reason, even if the science teachers had the study guides and teaching guides on hand, it did not help them make their teaching effective.

The limited or missing laboratory equipment and materials, and library facilities as well as the non-implementation of the new approach in science teaching, even with the guides on hand, may have some relation to the poor achievement in science.

Physical Facilities for Science Teaching

The physical facilities of the science room are adequately suited to science teaching if the room is comfortably wide enough for la-

boratory work and discussion. There are demonstration and work tables, and the important necessities in science teaching are within the easy reach of the science teachers and pupils.

The representative sample schools in the District of Roxas City had adequate classroom space for science discussion and experimentation. The science teachers held their science discussion and laboratory work in the regular elementary classrooms. The demonstration table, visible to all the members of the class, which is very necessary for the convenience on the part of the teacher demonstrator and to catch the interest and elicit the participation of the pupils, was limited. Only eleven of the science classrooms out of forty-three visited had a demonstration table visible to all the pupils. Washing facilities, more work tables, simple science equipment, adequate space, and equipment for maintaining living plants and animals were also needed. Only fifteen out of the forty-three science classrooms visited had washing facilities. Only one science room used laboratory tables for working purposes and stools for sitting. The remaining forty-two science classrooms used writing

desks for their work tables. Ten science classrooms had aquaria and one of these ten classrooms had a terrarium for maintaining living plants and animals. The other thirty-three science classrooms had none. The display shelf for preserved plants and animals was moderately provided for. Most of the science classrooms under study had limited or no provisions for the storage of equipment and materials. The provision for the safe storage and handling of hazardous materials was also limited or missing. As for the use of audio-visual equipment, readily accessible first aid and safety equipment as well as for the book shelves and magazine racks, were moderately provided.

With the kind of provisions for the physical facilities for science teaching as summarized above, the science classrooms under study were not adequately suited to science laboratory work. This condition may be one of the causes which caused the poor achievement in science of the representative sample pupils in this investigation.

Supervisory Assistance

Supervisory assistance is universally acknowledged as a "must" for all teachers. It serves as a

"peep" to teachers who are growing old in the service and it gives them a chance to have ideas of new trends in education. All these ultimately redound to the improvement of the quality of teaching. For this reason, the researcher gathered data on the supervisory assistance the science teachers under study received.

The supervision given to the science teachers under study, of the District of Roxas City, was the "Try this to find out" type. However, about 43% of the science received under study received no supervision at all.

CONCLUSION

Based on the findings of this investigation as summarized, the investigator inferred that the science teaching in the intermediate classes in the schools of the District of Roxas City leaves much to be desired because of the following conditions:

1. Majority of the science teachers in the District of Roxas City had no training in the modern approach of science teaching.
2. Very few of the science teachers who had training implemented the new approach in teaching science.
3. Most of the science teachers had very limited or insufficient

time in preparing for their science teaching.

4. The laboratory equipment and materials were very limited.

5. There was a lack of well selected and easily accessible science books, periodicals, pamphlets, and reference materials.

5. The physical facilities of the science rooms were not adequately suited to science teaching due to the lack of the following:

a. demonstration table

b. work tables

c. washing facilities

d. storage space for equipment and materials

e. safe storage and handling of hazardous materials

f. space and equipment for maintaining living things

7. Many of the science teachers received no supervision on science teaching.

RECOMMENDATIONS

From the findings of this study and from the aforementioned conclusion, the following recommendations are proposed:

1. Majority of the science teachers in the District of Roxas City had no training in the modern approach of science teaching. Teachers therefore should exert more

effort to improve their competency by taking up subjects in science during summer sessions or Saturday classes as well as attending science seminars.

It is worth noting what L. Patton said regarding professional growth:

However well a teacher educator is equipped prior to his engagement in the task of teaching, in a very short time what he teaches would become outmoded. He can not himself remain static in a world that is dynamic. He must grow intelligently and must grow in the profession for professional maturity and competence are developed and refined on the job and an individual never reaches the point where professional growth is no longer necessary.

2. Hold science seminars to orient the science teachers on the different aspects of a science lesson, the understanding of scientific facts, and the development of science process skills and scientific attitudes. They should also be oriented with the different approaches or methods of teaching science so they will know what to use to attain effectively the objectives of science lessons.

3. Very few of the science teachers who had training implemented the new approach in teaching science. To insure the full implementation of the new approach of teaching science, there must be a close supervision of science teachers and an achievement test before the end of every school year must be given in keeping with the new trend of science teaching.

4. Most of the science teachers had very limited or insufficient time in preparing for their science teaching. For this reason, a science teacher should be given one subject teaching load less than the other teachers to give them more time to prepare for their laboratory lessons. An advisory work to a class must be given an equivalent of one subject teaching load.

5. Since the findings show that laboratory equipment is very limited in the schools under study and factory-made equipment are hard to secure in rural areas due to financial reasons, science teachers should use their initiative to make and accumulate simple science equipment out of local materials. They can also get the help of their pupils by asking them to make simple science equipment as their yearly project.

6. As to materials for science laboratory work, the schools under

study had very limited supply so teachers should use local materials. They can ask their pupils to bring the needed materials before the time for laboratory work or lesson. In so doing, the teachers will have many helping hands. They can reach out to the homes of his pupils and all parts of the community as source of these materials.

7. It was found out that there was a lack of well selected and easily accessible science books, periodicals, pamphlets, and reference materials. To remedy the situation, a science teacher should try his best to put up a small science library in the science room. This cannot be done in a few days. However, science books, periodicals, pamphlets and other reference materials can be accumulated from year to year.

8. The physical facilities of the science rooms in the schools in the District of Roxas City was found not adequately suited to science teaching due to lack of demonstration and work tables, washing facilities, storage space for equipment and materials, safe storage and handling of hazardous materials, and space and equipment for maintaining living things. Our government cannot give us all that we need in school, so science teachers

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should learn to help themselves. The physical facilities of the science room can be improved little by little every year through the help of homeroom parent-teachers organization, science clubs, and civic-minded citizen in the community.

9. The survey on science teaching in the District of Roxas City revealed that many of the science teachers received no supervision on science teaching. Since the number of science teachers in the District of Roxas City is too many for one science supervisor, the immediate heads of the school can help supervise them. Teachers who are competent and knowledgeable in science teaching can also help their co-science teachers in this line. □
