SECTION E, SCIENCE EDUCATION

Improving Elementary Science Instruction Through In-Service Teacher Training

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The problem from which this paper is to grow is not unlike most of the problems as man first senses them. It is poorly defined and little understood by any segment of all those professing interest in its solution. A situation most analogous to the present science education dilemma is that of choosing the one end of string from a twine saver's treasure that will unravel with the least entangling confusion to reveal some core secret. Is a common appreciation for science, a citizenship in science, a fundamental tenet of democracy?

There seems to be an awareness that our accumulated experience and knowledge would allow us to refine the problems of science education so as to pursue their solutions more methodically at this time. Recorded in the history of science is a vague pattern for the growth of numerous ideas. Current literature reveals an increasing number of contributors to our backlog of knowledge. It is generally assumed that the trend to more universal education is a contributing factor for this exponential gain in scientific knowledge and its application.

The problem may be how and when is the human mind set off to its most productive generation of ideas. In its solution the fundamental

objective of science, wisdom, may need to be re-examined. Science is a product of intellectual gymnastics; it is not gadgetry nor fact, but may be inspired by either. If knowledge of gadgetry and fact are remote to wisdom, we must wonder if following a scope and sequence of topical facts in the science curriculum may not be secondary to maintaining a high level of curiosity and/or practicing a mode of questioning thought. In any case, the elementary teachers and their pupils are currently involved in an accelerated science curriculum where facts and partial truths are often emphasized over scientific attitudes and methods.

Many teachers of elemntary science are aware of inadequacies in their scientific skill, technique, and factual knowledge. They anxiously seek relief in this area almost wholly unaided by those most capable of giving assistance. The colleges and universities, the state departments of education, and the local school administrators need but to indicate a willingness to lend a helping hand by offering a practical, science enriched, teacher training program. They will be swamped with requests to participate. The in-service classes which the author has experimentally taught during the past three years bears this out.

The in-service science institutes for elementary teachers conducted through Arts and Sciences Extension of Oklahoma State University has served near five hundred elementary teachers. Ten additional classes have been scheduled for the second semester and a waiting list is growing.

The overall objective of the program is to improve both the quality and the quantity of science instruction by building within the elementary teachers a confidence and an ability to teach science with the same impeccable finesse they have in other subject areas. The success of the program specifically rests in the recognition given a composite of teacher requests to accomplish the following:

a. Demonstrate that science is a way of thinking designed to discover new knowledge by critically examining phenomena in the light of known facts. (The ability to do abstract reasoning is based largely on wisdom gained from basic, concrete experiences.)

b. Provide each teacher with a wealth of ideas for junior activities and experiences in science.

c. Acquaint teachers with current resource materials, ideas, and other aids of particular value.

d. Stimulate a personal exchange of ideas and methods for critical evaluation.

e. Help teachers to coordinate a unified science curriculum and strengthen the existing program in their school.

f. Prepare the teachers to present scientific fact, theory, and method to students as tools for a lifetime of intelligent decisions rather than as immediate answers to tests.

g. Bring into the elementary curriculum a perspective of recent knowledge.

h. Relate science to the other disciplines of learning so that their understanding may contribute to a more abundant living; avoiding the stressing of science as an end in itself.

i. Furnish a foundation course from which a teacher may do further study and reading in specific science disciplines.

The subject matter to be presented is tailor-designed for the program. It varies in the science areas according to the desired and recognized needs of the teachers, and the ability of the instructor to show its adaptability and practicality for the elementary curriculum. Most of the general science areas can be treated lightly in the time alloted for classroom contact with the teachers. Supplementary instruction may be provided as the instructor makes himself available to work within each individual teacher's classroom during school hours for individual consultation and demonstrations with the children.

Advantages over conventional in-service teacher training programs are notable. The plan provides an opportunity for professional improvement to a larger number of teachers in a near ideal environment in which theory can be immediately disseminated, tested, and evaluated. Scheduling the instruction through three non-consecutive weeks allows for concentration of study without it becoming an excessive burden with other duties. The sponsoring institution builds good will through this service. The promotion of continuing education, whether in science or related areas, strengthens the most vital of national resources.