

What the Colleges Can, and Should Offer the In-Service Teachers

FRED W. ALLEN, Southwestern State College, Weatherford, Oklahoma

In order to find out what was being done in the In-service training in Oklahoma, letters of inquiry on this subject were sent out to the six State Colleges, O. U., A. & M., and other colleges in the state. I learned from the replies that In-service training means different things to different people, that there seems to be no uniform program among the different colleges, and that in-service training in the colleges ranges from none at all to fairly good programs in some instances.

Without revealing the identity of the reporting colleges, a quick summary will show how each reported.

- College No. 1: Not primarily a teacher training school so no In-service training is given.
- College No. 2: Offers night or Saturday Classes. Offers no courses in subject; only professional education courses. Correspondence courses not satisfactory in the sciences, no laboratory. Only one course that could be considered In-service, "Methods of Teaching Biology."
- College No. 3: Offers in connection with the fifth-year program various courses in several sciences to teach the scientific philosophy rather than stressing methods of teaching science.
- College No. 4: Offers only methods courses in education and practice teaching. Sees need for more subject matter courses.
- College No. 5: Offers required education courses. One course on undergraduate level called a "Methods Course in Biology." A three-hour course in the fifth year, called "Biology and Physical Science." Feels a need for more subject matter courses and fewer education courses. Makes the comment that science should not be taught as a side line or by coaches.
- College No. 6: Teaches Natural Science at elementary level.
- College No. 7: Offers nothing
- College No. 8: Offers biology for teachers.
(Covers Materials)
Aquatic insects
Two courses in birds
Methods course in science.
- College No. 9: Has field trips; no scheduled in-service courses.
- College No. 10: Has work shops, science fair; comments that a science fair would do a lot of good.

In a discussion of this kind I think we should, at the outset define what we mean by in-service training, since the above survey indicates that there is no unified program of In-service training among our colleges.

According to my own conception, and as broadly defined, In-service training would include all the educational experiences in which teachers would participate, after being employed, that in any way would help them do a better job of teaching science. This definition would presuppose at least two broad classifications of experiences:

1. Formal courses or classes provided by an educational institution, in the afternoon, evening or Saturday, during the school year or the regular summer session.

From the survey, I gathered that most colleges were doing some of this, but most colleges are not doing enough, especially in the subject matter fields.

2. Informal experiences such as non-credit work, seminars, discussions and workshops which could be planned at any time.

Most colleges are doing very little of this informal type of training. Some few conduct work-shops. This type of work usually does not give credit, which may account for the seeming lack of interest in it.

Need for In-service Training

Both types of activities, formal and informal, should be offered the science teacher. There is no substitute for a fundamental science background. Any teacher in the secondary school should have a profound understanding of the basic science courses he is to teach. The elementary teacher need not have as deep a program but should be thoroughly familiar with the basic scientific principles. Experiences which help to integrate all of the physical and natural sciences should be provided.

Too often, the high school course in science, instead of teaching science, teaches ABOUT science and consists of reading a book about things that are often foreign to the student, which results in the student's failing to develop a genuine interest in the science. Our science teachers should be trained in the application of the principles of science to situations in which secondary school pupils find themselves. The teacher should be able to show the pupil how science applies to him. By making it more personal, it will then become more interesting. General Science should be a survey type, of course, introducing the field of science. It should not be a substitute, as it so often is, for the more basic courses in each of the natural and physical sciences. This course should be interesting and well taught, and should provide a stimulus for a continuation of study in the specialized fields. Specialized courses, as Biology, Chemistry, Physics and Earth Sciences, should be offered in every high school after a good general science program is provided, and teachers should be properly trained to teach them.

How are we going to accomplish these needs?

Regardless of how well we train our teachers or how much they want to do a good job of teaching, it very often happens that they get into a teaching situation which does not permit them to carry out a sound science program. Here, I think, an In-service program of indoctrination is in order. If a person goes to the trouble and expense of preparing himself to become a qualified teacher, he has a perfect right to expect that when he finally accepts a position as science teacher, the high school administration will know what a sound science program should be and will help him to attain it. I realize that some of our school districts are very poor financially and do not have large operational budgets and that all activities must of necessity be limited. To that end, we should train our teachers in the use of materials found in their locale. We should teach them how to make use of cheap and inexpensive materials to illustrate scientific principles. We should teach them skills that will enable them to make what they can't afford to buy. We should also teach them to register a loud protest when, under these conditions, the Athletic Department gets \$1,000.00 while the Science Department gets only \$50. If the colleges, and we as leaders in the science teaching program, are going to be of real help to the teachers on the job, we must unite in helping them to adjust such absurdities. We should emphasize the need for more

funds allocated to the science budgets and exert whatever pressures are necessary on the high school administrators to see that this is done.

High school teachers should be encouraged to attend and participate in scientific meetings. By not doing so, it is very easy to lose contact with what is going on in the field of science. High school administrators should become more familiar with the experiences in science which are needed by students. It is both our job and the High School teachers' job to keep the superintendents and if necessary their boards informed as to the needs in science teaching. Whenever it is possible, superintendents should attend science meetings in order to learn the trends in science and the needs of their own teachers. It would be helpful, I think, if we could provide the superintendents and their boards with copies of studies and reports of what other schools are doing. Some in-service training directed toward bringing about a better understanding between teacher and administrator as to what a science program should be would be very helpful.

In some cases, it is not the fault of the administration or the lack of adequate budget or equipment that makes for poor teaching in the high schools. The science teachers themselves are to blame. There are several high schools in the Southwestern district that have adequate equipment, but it is not being used to the best advantage of the science program in the school.

One high school I visited recently had sufficient equipment to carry out a good high school program in general science and biology, but the equipment was stored in a small closet and the accumulation of dust attested to the fact that the equipment had not been used in several years. In our in-service training of teachers we should emphasize the experimental method wherever possible and get the teachers in the habit of using equipment when it is available. I am at a loss to know what to do in the in-service training of teachers that would help them in a situation I saw recently, where the teacher had to disconnect the butane heating system in the class room in order to have a connection for the only bunsen burner she had for experiments. Each time the class wanted to do an experiment calling for heat, a major plumbing job was called for. The teacher gave up in despair. This was a case of a good teacher in a poor situation. These are unusual and local situations, to be sure, but they do exist, and as long as they continue to exist, the caliber of science teaching in Oklahoma is going to continue to be poor. Nothing can be gained by criticism, but much can be gained by teachers and administrators alike, if they will work together to first, understand what should be done in a science program, and then work together to accomplish it. Discussion groups could very well provide the shot in the arm necessary toward such improvement.

Through informal discussion groups with our in-service teachers, we should counsel them on the need for recruitment of good students for science teaching. If we want to improve the caliber of science teaching, we must recruit good students and encourage them to become good science teachers. A good science teacher conducting an interesting science program is the best way to accomplish that. If we fail to motivate the student in science at the high school level, there is little likelihood that science would be the field of his choice in college. Through our in-service program, we should show the teacher ways in which to determine the students possessing scientific aptitude. The Science Fair idea, suggested by Dr. H. H. Bliss, is an excellent way to bring out hidden talents. It is difficult sometimes to sell a student on the idea of becoming a high school science teacher, when the same amount of training on his part will lead to much more rewarding positions. If we as science educators would quit "crying in our beer" over the acute shortage of teachers and devote our efforts to putting a higher value on science and science teachers, we would at one and the same time improve the quality of training and certifi-

cation, offer some real inducements for staying in the profession, and make the recruitment of good students for science teachers a much easier task.

At a recent meeting of the Southeastern Work Conference on the Teaching of Biology held in cooperation with the American Institute of Biological Sciences, many of the problems discussed were related to the acute shortage of qualified teachers. According to a recent statement of the U. S. Office of Education, less than 60% of high school teachers of biology have had the equivalent of a college major in biology. As high school enrollments increase, this shortage will become even more acute. At the same time an increasing number of high schools are requiring all pupils to have courses in biology, and a decreasing number of college graduates are choosing high school biology as a profession.

The conference approached the solution of this problem from two directions: (1) To improve the quality of training for high school teachers of biology and (2) to make the job more attractive, once the teacher has gotten into it. The meeting closed on this note, and I quote:

"State Departments should refuse to certify a person to teach biology unless he has had college courses which adequately cover the areas of the high school biology course. It would be better that biology not be taught in high school at all than be entrusted to a teacher who has had no training in the subject."

To meet the urgent demand for more high school teachers of biology and other sciences, the conference recommended that the teacher's position be made more attractive by establishing salaries and pension schedules more nearly compatible with those in similar professional groups in government and industry requiring comparable training.

Through our in-service program we must encourage the recruitment of good students for our future teachers, but at the same time we must be certain we have something to offer them.

Finally, our in-service training of teachers should emphasize the need for advertising science courses. We should show our teachers how to keep the specialized courses as well as general science courses before local school systems by use of newspaper stories, articles in professional journals, civic club programs, science fairs, and industrial tours. Whenever possible we should enlist the aid of the public by telling the story of science.

In conclusion, and by way of summary:

1. There seems to be no well-organized in-service program in science in most Oklahoma colleges.
2. In-service training in most cases consists of additional professional education courses.
3. Most colleges suggest a need for more subject matter courses and fewer education courses.
4. In-service training should be broadened to include dissemination of scientific knowledge and high school programs in science to administrators.
5. Standards of science teachers and teaching situations should be raised.
6. Recruitment of good students for science teachers should be maintained.
7. Advertisement of science programs should be carried on.