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Abstract Papers

SCIENTIFIC REALITY IN A LOCAL ENVIRONMENT

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ABSTRACT

Scientific experiences need not be confined to large technical laboratories, but may readily be made by everyone, everyday, in every locality and environment.

Minerals and rocks, climate, water, soil, conservation, lighting, transportation, green plants, communication and many other limitless examples of scientific interest in a Living World are available everywhere.

The science teacher assumes the role, the guide through which these different channels of scientific interests are to be opened to young minds.

Scientific facts mean very little to the pupils unless they are able to see reality in each type of situation.

Probably one of the best means to help the scientific facts become realities is by correlating project work with each unit of material studied. The use of project work gives the pupils a clearer understanding of this Living World, as well the fundamental knowledge of the principles of the scientific agencies that play such an important part in his environment. The student is also able to develop those scientific attitudes which may help him to discover ways of thinking and solving his own problems with which he may be confronted in his daily life.

Project work may be developed along several lines so that the difficulties of individual differences in the classroom may to some extent be alleviated.

The projects may be divided under the following group headings:

I. Individual projects — charts, miniature models;
II. Group projects — museum, notebooks.
III. Oral projects — Lives of scientists; discussion of topic to correlate with subject matter studied. Example: "Conservation of Forests."

Science teachers must recognize the importance of scientific method in their science teaching. This method places the emphasis on the analysis and on the synthesis of scientific factual information into a living environment.

The field of science can contribute much to the practical and cultural growth of our young people so that they can make proper adjustments to their environment.

PLANNING A TESTING PROGRAM FOR THE EVALUATION OF THE NEW INTEGRATED COURSES IN SCIENCE

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ABSTRACT

The purpose of this paper is to discuss some of the things that should be considered when developing a testing program for the evaluation of these new hybrids or mutants that are called science courses.

The writer contends that the content of any test should not only provide a representative sampling of the expressed aims and objectives of the course but that it should also be so constructed that it will allow the pupils of any teacher to demonstrate a large portion of the things which have been stressed in that class. That necessarily means that the test may have to cover a rather large area and, for any one group, the test will appear more difficult than some that might otherwise be administered.

The writer would also like to suggest that these items be grouped or unified. In the test that has been constructed here for use in evaluating achievement in various physical science courses, thirteen units have been used. Some of these are: Apparatus and its uses; Practical problems in science; Reasoning and use of scientific method; Metric system and mathematical constants; Concepts relating to matter; Association of common names and formulas; and others of a similar nature. By constructing a test in this manner, it is possible to obtain a "profile" of the areas in which the teacher has been successful or in which the pupil has been able to achieve highly. Whether one be interested in an analysis between several groups or within a single group, and regardless as to whether one is immediately interested in achievement, diagnostic, or prognostic results, he will still find the scores based upon grouped or specialized information of infinitely more value than merely accepting the grand total as a meaningful measure.

It seems to the writer that it is only through tests of this kind that it will be possible to evaluate the various types of science courses now appearing and it does seem reasonable that even the more traditional courses might need some re-analyzing. Through the development and use of tests such as the one described, the teachers will moreover become more cognizant of the admitted aims of the courses today and hence should do a much better job of teaching.

A PHOTOGRAPHY COURSE FOR TEACHERS

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ABSTRACT

During the last few years there has been a rapid growth in the interest shown in photography. Not only have many adults become interested, but many secondary school students have become conscious of the wide applications of photography. As a result many camera clubs have been organized and in many instances the high school teacher, particularly the science teacher, has been called upon to sponsor this activity.

Throughout this same period visual education has received additional emphasis. Both the silent and sound motion picture projectors have been reduced in price so that they have become available to schools with limited budgets. In the case of still projectors, a new lantern slide projector using the small 2 x 2 inch slides has been introduced and become very popular. With these projectors it is possible to show colored pictures in the classroom of views taken by the teacher on her vacation trip.

It was felt that in a photography course for teachers the objectives should include a knowledge of the scientific background of photography and visual education and the acquiring of the mechanical skills involved in both.

A course of this type was introduced at the Mankato State Teachers College last year. The course carried two quarter hours of Physics credit. The students met together for one hour per week in conference or discussion and spent about three hours per week in laboratory work.

The subject matter essential to realizing the objectives of the course included the following:

1. OPTICS: fundamental laws of optics; lens defects; lens speed and angle of view.
2. PHOTOGRAPHIC EQUIPMENT: different types of cameras; general accessories; darkroom equipment.
3. PROJECTION EQUIPMENT: different types of projectors; accessories; care of equipment.
4. MAKING THE NEGATIVE: Characteristics of different emulsions; chemistry of development and fixation; processing procedures.
5. MAKING THE POSITIVE: contact prints; enlargements; lantern slides; use of 35 mm positive film; characteristics of different printing papers.

In the laboratory work the following experiments and projects were undertaken:

1. The pinhole camera.
2. Determination of camera shutter speed.
3. Finding depth of focus of camera lens.
4. Comparison of exposure and latitude of films.
5. Comparison of different grades of printing paper.
6. Making lantern slides (both large and small).
7. Copy work and enlargements.
8. Infra-red photography.
9. Operation and maintenance of 16 mm silent and sound projectors.
10. Splicing of 16 mm silent and sound films.
11. Making and organizing a visual education program for an elementary science course.

Since our physical equipment and darkroom facilities were inadequate to accommodate all of the students in laboratory work at the same time the experiments and projects were assigned in advance and the students divided into small groups. These small groups made darkroom reservations and carried out their experiments at their own convenience.

In conclusion it might be stated that (1) the students enrolled in the course were better fitted to handle camera clubs and visual education programs in the secondary schools, (2) the students gained a clear and better conception of the chemical and physical principles involved in photography, (3) a definite interest in photography as a leisure-time activity was aroused.